HISTORICAL QUANTITATIVE STUDY OF PRENATAL CARE

IN STARR COUNTY, TEXAS, 2006-2009

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HISTORICAL QUANTITATIVE STUDY OF PRENATAL CARE

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CHAPTER I

INTRODUCTION

Introduction to the Study

Since the 19th century, United States' interest in the welfare of mothers and children had grown (Schmidt, 1973). This interest was due to the ideas and practices in Europe. As a result of these practices, the United States began to implement the child health movement. Throughout the 19th century, many regulations and laws were enacted to maintain the health of mothers and children (Schmidt, 1973). Over the century, the United States fell behind in many national measurements, such as infant mortality rate. Currently, the U.S. has a ranking of 29th among industrialized nations in infant mortality, preterm birth, and low birth weight babies (Novick, 2009).

During the 1990s, a healthcare initiative called *Healthy People (HP)* was created to address the nation's health. Many *Healthy People* objectives, standards, and goals were established to increase the quality of health in the community. One of *Healthy People's* objectives included reducing health disparities and increasing access to preventive care (Thompson, Koplan & Sondik, 2001). A special population identified in a *Healthy People* objective was pregnant women and infants (Mason, 1991). In addition, research showed prenatal care varied among cultural, demographic, and socioeconomic status within the U.S. and among *Healthy People* objectives (Alexander & Kotelchuck

2001). While *Healthy People* developed initiatives to address pregnant women and their infants, some areas within the United States remain unaddressed. McDonald et al. (2008) described the Texas/Mexico Border as a high immigration area with high fertility rate and low education and socioeconomic status. This region continued to have health disparities even though Federally Qualified Health Centers (FQHC) had been established. These health centers provided primary care to mothers, yet the prenatal care objective set by *Healthy People* still were not met in this area. The factors that prevented the women from seeking care need to be identified so more effective approaches could be implemented (McDonald et al., 2008).

Statement of the Problem

Prenatal care can improve many factors regarding the mother and the fetus. The Hispanic women in the U.S. are the highest prevalent group to not receive early prenatal care at 64.8% (Byrd, Mullen, Selwyn, and Lorimor, 1996). Furthermore, Byrd et al. (1996) researched the factors that prevented the initiation of early prenatal care despite the laws, regulations, and federal programs enacted by the U.S. government.

In addition, the population of the Texas/Mexico border region has more children and young adults in greater proportion than in the U.S. overall and most importantly, a greater proportion of reproductive age adults (Robles et al., 2008). According to Robles et al. (2008), among this population, many pregnancies may be unwanted and the risks and consequences of these types of pregnancies are increased. The U.S./Mexico border needs an increase in reproductive health education and family planning (Robles et al., 2008). Research also suggests these educational initiatives need to take place among U.S. women who are young, have not completed high school, and have never been

pregnant. In addition, including all U.S. women in these educational initiatives who have not yet conceived would be a benefit to the area (Robles et al., 2008).

Specific border counties such as Hidalgo, Willacy, Cameron, and Starr counties located in the Lower Rio Grande Valley area of South Texas are a main focus for educational initiatives due to the high birth rates, low education, low income, and high population of young adults. These educational initiatives include reproductive health education and family planning within the counties. All of these counties are designated as medically underserved. In addition, until 2000, there were no gynecologists or obstetricians in Starr or Willacy counties (Day, 2004).

Specifically, Starr County has the second highest population growth (32.3%), highest Hispanic population (97.5%), and highest foreign-born immigrants (36.9%) of all counties in Texas. Demographically, Starr County has the highest percentage of individuals with less than a ninth grade education (46.3%), highest rate of unemployment (16.7%), and the highest amount of individuals living below the poverty line (50.9%) compared to other counties in Texas (Mier, Flores, Robinson, & Millard, 2004). In summary, Starr County has the highest amount of disparities within the four counties in all categories. With this information, the problem for this study was: what inhibited the decisions of Hispanic mothers of Starr County to not receive prenatal care at an earlier time in their pregnancies.

Background and Significance

Early prenatal care is important for the promotion of nutrition and education for both mother and fetus. Factors that contribute to the goal of early prenatal care are for soon-to-be mothers to understand importance of nutrition, appropriate maternal weight

gain, healthy behaviors during pregnancy, and the development of the fetus in utero. Most importantly, early diagnosis of problem pregnancies can be identified with early prenatal care. Hispanic women have the lowest rate, at 64.8%, of first trimester prenatal care (Byrd, Mullen, Selwyn, & Lorimor, 1996). According to Byrd et al., initiating care in the first trimester is significantly associated with being older than 24, having insurance, and having a planned pregnancy (1996).

The influence of prenatal care has become of interest to researchers due to the increase in U.S./Mexico population in the recent decades. In particular, the U.S./Mexico border region shows a large increase in population yearly and is documented to continue increasing. The U.S./Mexico border region reaches 100 km north and 100 km south of the international divide. This region is home to 14 million people and recent high birth and immigration rates have caused an increase in population and growth, which are calculated to continue through 2030. This growth is due partially to the occurrence of nearly 300,000 births per year in the border communities (McDonald et al., 2008).

Consequently, according to McDonald et al. (2008), women from the Texas/Mexico border counties are less likely to receive prenatal care than are women in other counties in U.S./Mexico Border States. In addition, pregnant adolescents in the Texas/Mexico border region received late or no prenatal care, while having the highest birth rates in the United States (McDonald et al., 2008). Researchers believe these statistics are due to low education levels, limited community resources, uneven distribution of services, and a mobile population. These barriers are identified in several studies that studied what inhibits women from receiving early prenatal care (McDonald et

al., 2008). With the increase in population and the current prenatal care knowledge in the area, the Texas/Mexico border counties prenatal care could continue to fall below *HP* 2010 standards (McDonald, et al., 2008).

Furthermore, adolescent childbearing and parenting are also associated with adverse effects on the health and quality of life for both mother and infant. In 2006, the birth rate for Hispanic women aged 15-19 years was 83 per 1,000, compared to 42 per 1,000 for all U.S. women of the same age group. In addition, birth rates for Hispanic women aged 20-24 years were 177 per 1,000 compared with 106 per 1,000 for all U.S. women in this age group. In 2004, the birth rate among women aged 15-19 years was 62 per 1,000 in Texas and 96 per 1,000 in the border's southernmost county, Cameron County. Due to Cameron County's close proximity to Matamoros, Tamaulipas, Mexico, these statistics were reflective of this Mexico border region (Gonzalez et al., 2008).

In Cameron County, Texas, the location of the cities of Brownsville and Harlingen, a pilot project was implemented by the Center for Disease Control called The Brownsville-Matamoros Sister City (BMSC) Project for Women's Health. The goal of the project was to develop reproductive health statistics and baseline information that were lacking in the U.S./Mexico border region (McDonald et al., 2008). The city of Matamoros and Cameron County, Texas, were chosen due to their geographic proximity, similar ethnic origin, and comparable birth outcomes. In addition, the U.S./Mexico Border Health Commission set objectives for reducing adolescent birth rates on both sides of the border and improving the delivery of prenatal care to women of all ages by 2010. The initial target was 20% reduction in births among adolescents in the Mexican

border region and 33% reduction in the border region of Texas among all women (Gonzalez et al., 2008).

From this project, researchers were able to gather information about birth rates in the cities of Brownsville and Matamoras, unintended and repeat pregnancies, educational initiatives, and cultural factors. Researchers believed the vital statistics from the city of Matamoros and Cameron County were not true statistics due to pregnancies that might not have resulted in live births. Research from the project showed that Cameron County had a large proportion of unintended and repeat pregnancies. In addition, this county had an increased number of women who were single and who lacked health insurance at time of conception compared to Matamoros. In fact, Gonzalez et al. (2008) also showed that women who were married or living with a significant other were in greater proportion in Matamoros than Cameron County. This same population also showed a larger proportion of Hispanic women carrying health insurance. Research from the BMSC project reported that the median interval of 24 months between the current live birth and the birth of the previous child for women in Cameron County, whereas Matamoros showed 36 months (Gonzalez et al., 2008).

The Lower Rio Grande Border of the Texas/Mexico border region includes the counties of Cameron, Hidalgo, Starr, and Willacy. With the exception of Willacy, these counties show a higher growth rate than the State of Texas. This growth rate increases the amount for reproductive age adults. The low education levels, high poverty rate, high unemployment rate increase the focus upon this area for additional research (Day, 2004). Of all the counties located in the Texas/Mexico border region, Starr County ranks highest

among almost all of the disparities seen within the area. The prevalence of the high disparities within this one county is the cause of interest for this study (Day, 2004).

Specifically, according to the Center for Public Policy Priorities (2007), Starr County demographic statistics include the median age being 26 with only 34.7% of the adult population having a high school diploma. The predominant language of Starr County is Spanish with 90.7% of the population speaking it at home. The total population of Starr County is 61,193 (2005 data) with 59,815 people being of Hispanic heritage. The total child population from ages 0-18 years is 21,907 with the highest age cohort being from ages 0-5 years (Center for Public Policy Priorities, 2007). According to 2004 data, there were 1,492 births with 297 births from teens between ages 13-19. The infant mortality rate was 5 births per 1,000 live births and 116 low birth weight babies. The births to women who received inadequate prenatal care were 387 per 1,000 births (Center for Public Policy Priorities, 2007).

Research Questions

Throughout this thesis, the main question was what inhibited the decision of Starr County women to not receive early prenatal care. The factors analyzed were the reasons women did not receive early prenatal care. During this thesis, Starr County, Texas, was analyzed as to what hindered women from not receiving prenatal care in the area. In Starr County, all age groups of pregnant women coming into the Federally Qualified Health Center (FQHC) were studied. The participants were grouped into the age cohorts of 18-24 years, 25-34 years, and 35-44 years to determine if the barriers were significant within the specific age groups. Lastly, the participants were grouped by trimester of

pregnancy to determine if there were barriers within each trimester that prevented women from seeking prenatal care.

The research questions for this study were: What were the barriers for seeking prenatal care? Was there a significant relationship between certain age cohorts as to barriers in receiving prenatal care? Was there a significant relationship between barriers among receiving prenatal care and trimesters of pregnancy? Was there a significant relationship between barriers among receiving prenatal care and language of choice?

Purpose of the Study

The main purpose of this study was to determine the barriers that prevented women from seeking earlier prenatal care in Starr County using statistical measures. The high amount of disparities among Starr County decreased the prevalence to seek prenatal care. Exposing the disparities of Starr County and focusing on prenatal care within the underserved area defined barriers to not receiving prenatal care. These barriers were analyzed to find the most significant barriers that prevented women from seeking prenatal care. In addition, to fully understand these barriers' relationships with the population of the Starr County, the data were categorized into age groups and trimesters of pregnancy. The significant barriers were analyzed by age groups and against the first, second, and third trimesters of pregnancy to understand the specific barriers in receiving care within each trimester of pregnancy. After isolating the significant barriers among the survey participants, among the age cohorts, and among the trimesters of pregnancy, suggestions of educational initiatives and programs were made for Starr County.

Assumptions

In this study, secondary data were used. The data was gathered from a questionnaire given to a population of pregnant women in Starr County during the years of 2006 – 2009. The external evaluator organized the data into an Excel spreadsheet, which was given to the current author for further research. The researcher assumed that the questionnaires were answered honestly and to the best of the participants' knowledge. The participants' identification remained confidential, so the study relied deeply on the truthfulness of the participants.

Limitations

The limitations to the study pertained to the data collected. The data collected in this study were specific to the population in one county in South Texas. Acculturation of Hispanics that occurred in South Texas could differ from acculturation patterns in of the areas of the U.S. Thus, the results and discussion of this study can be applied to this population and not generalized to all Hispanic populations.

In addition, this study was using secondary data, which was a limitation to the study. Surveys were given to pregnant women who were receiving prenatal care at the FQHCs located in Starr, Cameron, Willacy, and Hidalgo counties. Information from these surveys was transferred into the Excel spreadsheet by the external evaluator. This caused a limitation due to the inability to control how the survey was given at the clinic. In addition, reliability of transfer of information from survey to spreadsheet was out of the control of the author.

CHAPTER II

LITERATURE REVIEW

History of Maternal and Child Healthcare

Interest in maternal and child health began in the 19th century. The initial interest began by documented research of a correlation among contaminated milk and high infancy mortality rate, which demonstrated the need for prevention of communicable diseases and infant death. At that time, it was understood by researchers that if preventive health services for children were to be effective, they must be accompanied by educational measures for the parents (Lesser, 1985). Consequently, medical education in pediatrics and obstetrics and advances in medicine increased the emerging concept of maternal and child health (Schmidt, 1973).

One of the first pervasive and influential federal involvements of maternal and child health was the United States Children's Bureau. Enacted in 1912, the Act directed the Children's Bureau to investigate all matters of child welfare. This included federal regulations in documenting infant mortality and birth rates. This Act established a precedent for reports and findings to help state and local groups to take appropriate action to improve the care of pregnant women and children (Lesser, 1985).

Research within the Children's Bureau Act demonstrated the relationship between social and economic factors to the medical causes of prenatal death. As a follow up to

the Children's Bureau Act, the first public health grants-in-aid program was enacted. This Act became known as the 1921 Sheppard-Towner Act. The 1921 Sheppard-Towner Act encouraged many improvements in health services for mother and infant such as birth registration, increase number of health departments, and implementations of organizations such as the National Child Labor Committee. Overall, increased partnerships between state and federal governments contributed support for funding for maternal and child health services (Lesser, 1985). In addition, the Sheppard-Towner Act recognized and funded the need to have special health workers in public health programs (Schmidt, 1973).

With continued advocacy for maternal and child health, the Children Bureau and the Sheppard-Towner Act moved to collect data and prepare a plan for future maternal and child health programs. The proposed plan became the basis of the child and welfare sections of the 1946 Social Security Act. This grant-in-aid project was the beginning of the nationwide program of care for childbearing mothers and their infants (Schmidt, 1977). In 1954, grants began to be funded in maternal and child health to promote community services to mentally retarded children. During this time, a correlation between childbirth and mental retardation became a popular belief by researchers. Researchers believed crippled children were a result of inadequate care before childbirth. Due to this correlation, amendments to the Social Security Act were made to include comprehensive care for maternity care and youth (Lesser, 1985).

Overall, the grants-in-aid from the Social Security Act provided support to state and local health departments for a nationwide program of public health services. The grants included services for promoting the health of mothers and children especially in

rural areas and areas in severe economic distress. Most of the funds were used for prenatal care, well-baby clinics, immunizations, school health services, and health education (Lesser, 1985).

Implementation of Federally Qualified Health Centers

To increase care in rural areas, the Rural Health Clinics Act (RHC) was passed in 1977. This Act encouraged the utilization of physician assistants and nurse practitioners by providing reimbursement for services these health professionals provided to Medicare and Medicaid patients. Another goal of the Act created a cost-based reimbursement for services provided at clinics located in underserved rural areas (Duke, 2006).

Another type of health center was Federally Qualified Health Centers (FQHC), which included health centers under the Public Health Service (PHS) Act. This Act included Community Health Centers (CHC) and Migrant Health Centers (MHC). The FQHC program was created to allow for special Medicare and Medicaid payments for the CHC and MHC for the care of uninsured individuals (Duke, 2006).

Furthermore, FQHC and RHC also required a certain type of services. FQHC required that services such as primary health care, primary care for all life-cycle ages, basic lab, emergency care, radiological services, pharmacy, preventive health, preventive dental, transportation, case management, dental screening for children, after hours care, and hospital/specialty care be provided at the health center. On the other hand, RHC required primary health care services, first response emergency care, radiological services, and basic lab. Overall, FQHCs were located in underserved areas, provided care for the uninsured, and were required to provide enabling services (Duke, 2006).

Implementation of Healthy People

While knowledge of preventive and on-going care increased over the decades, in 1979, the Surgeon General released a report on *Healthy People: Health Promotion and Disease Prevention*. This report provided national goals for increasing the health of the U.S. population in five major life stages: infants, children, adolescents, adults, and older adults. Specifically in infants, the report targeted low birth weight and birth defects. Over the decade, several reports established additional objectives for the nation. These reports led to the nation's health improvement agenda for the 20th century called *Healthy People (HP) 2000.* The overall goals of *HP 2000* included an increase in the span of healthy life, a reduction in health disparities, and access to preventive services (Thompson, Koplan, & Sondik, 2001).

As the end of the decade arrived, a review of the goals and transitions into the next phase of the *HP* initiative occurred. *HP 2010* included an emphasis in access of care by focusing on data and information systems with the upsurge of the Internet and technology and to continue eliminating health disparities (Thompson, Koplan, & Sondik, 2001). *HP 2010* also had an increase in objectives and focus areas compared to *HP 2000*. One focus area included maternal, infant, and child health. Within this focus area, *HP 2010* outlined objectives such as decreasing the infant mortality rates between Caucasian and specific racial and ethnic groups. In addition, the focus area was divided into certain age cohorts. By outlining the focus area into age cohorts and ethnicity, target populations were developed in which the federal government established initiatives to address disparities (Thompson, Koplan, & Sondik, 2001).

Healthy Start Initiative

One of the initiatives set forth by the U.S. government during the time of *HP 2000* was the *Healthy Start* program. The Department of Health and Human Services (HHS) funded 15 urban and rural sites in communities with infant mortality rates that were 1.5 – 2.5 times the national average. The initiative began with a five-year phase to identify and develop community-based systems approaches to reduce infant mortality by 50% and to improve the health and well being of women, infants, children, and their families. Many of the principles underlying the *Healthy Start* program were innovations in service delivery, community commitment and involvement, personal responsibility demonstrated by expectant parents, integration of health and social services, multi-agency participation, increased access to care, and public education (Devaney, Howell, McCormick, & Moreno, 2000).

These principles were outlined in projects that addressed adequate prenatal care, promoted positive prenatal health behaviors, met basic health needs such as nutrition, housing, and psychosocial support, reduced barriers to access and enabled the client. The national perimeters for low birth weight were also defined by *Healthy Start. Healthy Start* defined babies who were 5.5 pounds or less at birth as low birth weight and babies who were born weighing less than 3.3 pounds as very low birth weight (Devaney et al., 2000).

Above all, while decreasing the prevalence of low birth weight babies was important for the fetus and the mother, the medical and social costs for low birth weight babies were very significant. A reduction in long-term cost of low birth weight babies was beneficial to the hospitals. Low birth weight babies suffered from re-hospitalization,

medical and social service costs, and at times large special education expenses. Decreasing infant mortality due to the sophisticated medical technology had increased the low birth weight percentage (Devaney et al., 2000).

To improve the low birth weight rate, the practices, and behaviors of women while pregnant needed to change. The major cause of low birth weight was risky behaviors or inattention to good health practices while pregnant. To change these behaviors effectively was to engage women early in their pregnancies and to find ways to encourage them to make changes in their lifestyles and lives. *Healthy Start* helped promote the change in these behaviors and the gap in racial disparity. Most importantly, *Healthy Start* focused on getting women into prenatal care as early in the pregnancy as possible (Devaney et al., 2000).

Healthy Start's first focus was upon the African American ethnicity due to the prevalence of infant mortality and low birth weight within this target population. For example, infant mortality and low birth weight among African American women was more than twice that of Caucasian women. While previous initiatives had helped to decrease infant mortality over the last decade, the gap between Caucasian and minorities had not been closed. Minority families fell into a target population to focus and prioritize in perinatal health services (Devaney et al., 2000).

Across the U.S. low birth weight and preterm delivery were higher among African American women than among Caucasian women. In spite of considerable research, the disparity between all minority groups was still perplexing. The women who delivered low birth weight infants generally were associated with complicated health and social problems. In addition, barriers stood between pregnant women and children and the care

they needed. For example, stress of poverty and the inability to pay for prenatal care services could be defined as barriers to receiving care. For the at-risk women who sought care, the health services were inadequate to meet their needs. The health services generally had a lack of health care providers or had providers who were at full capacity for Medicaid patients. Vital programs such as substance abuse treatment or mental health programs were also not readily available (Devaney et al., 2000).

The overall goal of *Healthy Start* was to provide and coordinate services and to mobilize communities to take ownership of the problem. In addition, *Healthy Start* designed and implemented programs in communities to have success (Devaney et al., 2000). Initially, the *Healthy Start* Program interventions began with fifteen individual *Healthy Start* demonstration sites. These programs reflected the circumstances and resources available in the community. The project areas included: Baltimore, Birmingham, Boston, Chicago, Cleveland, Detroit, the District of Columbia, New Orleans, New York City, Northern Plains, Northwest Indiana, Oakland, Pee Dee region of South Carolina, Philadelphia, and Pittsburgh (Devaney et al., 2000).

The *Healthy Start* projects included inner-city communities, clusters of cities, and rural areas. All the project areas differed greatly in terms of geographic, cultural, and political environments. In addition, all project areas had a high proportion of poverty and minority residents. Except for the Northern Plains, which focused on the American Indians, a large proportion of births were African American and only five project areas had significant proportion of Hispanics. The programs implemented were of outreach and case management, service integration, and coordination (Devaney, et al., 2000).

The *Healthy Start* target populations were from impoverished areas, received public assistance in some form, were unmarried, and were raising or expecting to raise their children alone. Many of the program clients were homeless, had criminal records, mental illness, or substance abuse problem. In general, all *Healthy Start* populations were high–risk groups. The program clients were more likely to be teens, had less than high school education, were African American, and had a lower income. In addition, they were more likely to have an unintended pregnancy. These high-risk populations were less likely to receive prenatal care in a private office and relied on hospitals or neighborhood health centers (Devaney et al., 2000).

Over the years of implementation, *Healthy Start* researchers studied the effects of the program in reducing infant mortality and improving birth outcomes. In addition, *Healthy Start* was successful in enrolling women and infants from high-risk demographic groups of adverse pregnancy outcomes. In eight of the fifteen project areas, the percentage of women who received adequate or better prenatal care was significantly higher than it would have been without *Healthy Start* (Devaney et al., 2000).

The Hispanic Paradox

The five project sites of *Healthy Start* in which the target population was Hispanic had been chosen due to the rural areas and social disadvantages. Ironically, while the Hispanic population was the most common population who received prenatal care late in their pregnancies (if at all), these pregnancies seldom resulted in low birth weight babies. Hispanic infants generally experienced low birth weight and mortality rates that were lower than the nation's average. Overall, the Hispanic population had a low birth weight incidence of 6.5% in 2002 compared to 6.9% in non-Hispanic population in

the United States. Hispanic mothers in the United States enjoyed favorable birth outcomes despite their social disadvantages (McGlade, Saha, & Dahlstrom, 2004).

Researchers defined these favorable birth outcomes as the Hispanic Paradox. Overall, there were several theories that explained the Hispanic Paradox. These theories included a healthy-migrant theory, and social support and cultural protective factors. The healthy-migrant theory proposed that the healthiest Hispanics migrated to the United States and this health advantage was responsible for the positive birth outcomes. This theory did have its confounding factors; it might also demonstrate the economic and environmental disadvantages Latin American countries might provide for pregnant women compared to the United States (McGlade, Saha, & Dahlstrom, 2004).

The strongest and most studied theory of the Hispanic Paradox was the impact of social and cultural factors on Mexican Americans, the largest Hispanic population in the United States. The social support system and community networks of the Hispanic culture contributed to this paradox. As stated previously, Hispanics tended to have favorable birth outcomes despite the correlation seen among socioeconomic status and birth outcomes (McGlade, Saha, & Dahlstrom, 2004).

In addition, cultural protective factors such as informal systems of health care might be interrelated with the Hispanic Paradox. The first informal system of healthcare might be the strong tradition of transferring knowledge among generations by which healthy behaviors were passed from one generation of mothers to the next. In addition, many mothers benefited from the support of other family figures such as sisters and extended family members. Hispanic women often took responsibility for the health

needs of those beyond their nuclear households. Hispanic fathers were also supportive and played a positive role in birth outcomes (McGlade, Saha, & Dahlstrom, 2004).

There was also Hispanic tradition of women helping other women in Latin American communities. This was termed *personalismo* and implied warm interpersonal relationships within the society. Equally important were *parteros,* or lay midwives, who had various levels of training and played an important part of the delivery and birthing process in Latin America. These types of relationships might provide a stress-buffering effect that improved the physiological stress seen in pregnancies. Whether these relationships affected the positive birth outcomes seen in Latin America, mothers who had this support experienced better outcomes than those who did not (McGlade, Saha, & Dahlstrom, 2004).

While the interpersonal relationships among Hispanic women might be strong, it was important for Hispanic women to receive formal prenatal care. For Hispanics who immigrated to the United States, over time cultural and social protective factors seemed to erode throughout generations. According to researchers, Hispanic women took up more unhealthy behaviors as they acculturated with U.S. (McGlade, Saha, & Dahlstrom, 2004).

Healthy Start in South Texas

A large proportion of Hispanics lived or migrated from Mexico to South Texas. Consequently, due to the high minority population, the U.S. Health and Human Services Administration, Maternal and Child Health Bureau funded a *Valley Primary Care Network (VPCN) Healthy Start Initiative* for a four-year project period in June 2000, and this project has continued to be funded. The *VPCN Healthy Start* program provided

services to underserved women of Cameron, Hidalgo, Starr, and Willacy counties. Many of the clients enrolled in the *Healthy Start* program fell between 85-100% of the Federal Poverty Level (FPL). The program encouraged women to seek early and regular prenatal care. The program also provided health education during community education presentations, one to one encounters, and local county health fairs. The several successes of the program within the community included community outreach, health education, and case management services (*Valley Primary Care Network Healthy Start*, 2003).

Lower Rio Grande Valley

The area of land covered by the *VPCN Healthy Start* project was termed the Lower Rio Grande Valley. The Lower Rio Grande Valley was characterized by Spanish and Mexican influences and was predominantly a Hispanic population (87%). Additionally, the population was younger than that of Texas with half of the total population being younger than 24 years old. Spanish was spoken in three-quarters of the homes and 29% - 46% had less than a ninth-grade education. Within the Lower Rio Grande Valley, 42% - 59% of children lived in poverty (Mier, Flores, Robinson, & Millard, 2004). The percentage of uninsured persons 19-64 years of age was 64% higher in the Lower Rio Grande Valley than in the state of Texas. The federal programs, such as Medicaid or CHIP, available in the area were 58% higher in the Lower Rio Grande Valley area. In addition, there was a great disparity between the number of primary care physicians available per Medicaid eligible persons in Texas and the number available in the Lower Rio Grande Valley (Sanderson, Brown, & McIntyre, 2004).

With these statistics, the healthcare resources of the Lower Rio Grande Valley and specifically Starr County were in great turmoil. The population of Starr County was

53,597 in 2004. Almost half of the population of Starr County had an education below ninth grade (Mier, Flores, Robinson, & Millard, 2004). Starr County had the highest percentage of Hispanic population within the Lower Rio Grande Valley (97.5%). Starr County also had the greatest percentage of foreign-born population at 36.9%. The educational status of Starr County directly affected the per capita income, which was the lowest in the Valley, at $7069. The unemployment rate was highest in Starr County at 16.7%, which was higher than any other county in the Lower Rio Grande Valley. Overall 59.4% of the population 18 years of age and older in Starr County were living below the poverty line. In addition, 45.7% of the persons 18 years and younger were living below the poverty line. Young adults who grew up poor were more likely than others to be delinquent, to earn low wages, and to be unemployed (Mier, Flores, Robinson, & Millard, 2004).

With the high population of young people, low education level, and poor access to health services, these risk factors created poor birth outcomes (Robinson & Anding, 2004). In particular, during 2002, Hispanic women bore 24,767 babies in the Lower Rio Grande Valley. Prenatal care in the area (68%) fell short of national statistics (85%) and did not meet the goal of 90% established by *Healthy People 2010.* The Hispanic Paradox prevailed in this area with the low occurrence of adverse birth outcomes despite the challenges in the area. The traditional practices of diet, non-smoking, and low alcohol consumption well known to the area were beginning to decline due to an increase in acculturation. For example, Hispanic adolescents not born in the United States ate more fruits, vegetables, rice, and beans and less fast food than Hispanic adolescents born in the United States (Robinson & Anding, 2004).

Additionally, Hispanic women in this area had a high prevalence of iron and folic acid deficiency during pregnancies, which were common nutrients that were given during prenatal care. The dietary reference intake for iron increased from 18mg/day for non-pregnant women to 27 mg/day during pregnancy, which was difficult to achieve through dietary sources alone. The prevalence of iron deficiency was approximately two times higher for Hispanic (22%) than among non-Hispanic white women (10%). Additionally, babies born to Hispanic females had a high prevalence of neural tube defects. Neural tube defects were linked to deficiency in folic acid and iron deficiency (Robinson & Anding, 2004). Prenatal care addressed this deficiency by providing prenatal vitamins to the pregnant women and educating them on folic acid fortified foods.

Federally Qualified Health Centers in the Lower Rio Grande Valley

In South Texas, the Community Health Center clinics promoted outreach, increased Medicaid enrollment, had case management services, addressed social values that promoted family and culture of character, and enhanced prenatal care education (Mason, 1991). The Federally Qualified Health Centers (FQHC) provided access to health and prenatal care, yet many Hispanic women continued not to receive prenatal care. Knowing the reason behind not seeking prenatal care was significant for this area of the U.S. (Mason, 1991).

Moreover, the four Federally Qualified Health Centers in South Texas provided access to primary and prenatal care. In Cameron County, the Brownsville Community Health Center (BCHC) provided continued care to the area. The FQHC in Harlingen was Su Clinica Familiar. In Hidalgo County, Nuestra Clinca del Valle provided care to the

area. Lastly, Starr County housed the Community Action Council of South Texas (CACST). Physicians of the four FQHC programs had hospital privileges at numerous sites throughout the region. There were sixteen hospitals in the Valley, one of which was located in Starr County. The Starr County Memorial Hospital had fewer beds (219.1 per 100,000) than the state (344.8) (Sanderson, Brown, & McIntyre, 2004). In addition, Starr County did not have a county health department, so Region 8 Texas Department of State Health Services supported public health needs. The public health services provided to the county included the Early and Periodic Screening, Diagnostic, and Treatment program (EPSDT), an epidemiology response team, immunizations, public health improvement, border health, and medical transportation (Sanderson, Brown, & McIntyre, 2004).

While there was the presence of Federally Qualified Health Centers and the Texas Department of State Health Services in the area, there were still many barriers to receiving prenatal care. The barriers could be grouped into three different categories called predisposing factors, enabling factors, and reinforcing factors, concepts explained in Green's PRECEDE model. Predisposing factors included knowledge, attitudes, values, and perceptions of the population. Enabling factors included barriers to resources that have access to care and reinforcing factors included attitudes and behaviors of health providers, peers, parents, and employers (Devaney et al., 2000).

Predisposing Factors

Ayoola, Stommel, and Nettelman (2009) studied the predisposing factor of late recognition of pregnancy. Low birth weight, infant mortality, or admission into neonatal intensive care unit was a probable deterrent due to late recognition of pregnancy.

Ayoola, et al. (2009) proposed that late recognition of pregnancy increased odds of preterm birth, low birth weight babies, and admission into neonatal intensive care unit. Physicians knew that within the first four weeks of pregnancy, the heart began to beat and by the eighth week, all major organs had formed. During this time, the pregnant women might continue risky behaviors such as drinking or smoking. The study defined late recognition as six weeks of pregnancy (Ayoola et al., 2009).

The results of the Ayoola, Stommel, and Nettleman (2009) study showed that the majority of low birth weight babies were born to women aged 21-25 and 46.2% were first time mothers. Pregnancy recognition was a prerequisite to initiate prenatal care. Overall, women who recognized their pregnancy late were 25 years or younger, not married (14%), covered by Medicaid (60%), received public assistance (62%), and had a high school education (37%). On the other hand, women who recognized their pregnancy early were 28 years old, married (54%), had private insurance (63%), received public assistance (36%), and had a college education (57%) (Ayoola et al., 2009).

Furthermore, knowledge of the benefits of prenatal care throughout the pregnancy was lacking. When at-risk women received prenatal care, they commonly used health care services only to validate the pregnancy and at the time of delivery. This type of pattern increased risk of miscarriages and infant mortality (Alcalay, Ghee, & Scrimshaw, 1993).

Additionally, Alcalay et al. (1993) found within their study community there was no concept of trimesters of pregnancy. Hispanic women referred to the stages of pregnancy as *al principio* to the first few months of pregnancy, and *al ultimo* as the last month or two. The Hispanic mothers believed that there were more dangers to the

fetus during early months of pregnancy and more dangers to themselves during the latter part of the pregnancy. Another predisposing factor was the impact of an unplanned or unwanted pregnancy on receiving early prenatal care. These factors were studied in San Antonio, Texas, by researchers Sunil, Spears, Hook, Castillo, and Torres (2010). Their survey instrument included background characteristics, pregnancy history and planning, ratings of the factors that influenced the women for not coming into clinics earlier for prenatal care, how the women felt towards doctor offices, and personal or financial barriers to receiving care. Their target population were women 18 years or older, in their third trimester of pregnancy or had given birth six weeks before the survey (Sunil et al., 2010). The highest rated barriers to receiving prenatal care early among the respondents were the financial barriers. According to Sunil et al., if Medicaid covered women before they became pregnant, it could have a significant impact on early initiation of prenatal care (2010).

Enabling Factors

Enabling factors included those barriers related to the healthcare system. Many women disliked constant checkups, feared tests, and were uncomfortable with exams. Many barriers influenced the attendance in receiving prenatal care. These barriers included transportation, substance abuse, lack of childcare, and lack of insurance (Novick, 2009). Additionally, Sunil et al. (2010) found there were a number of contributing factors to receiving prenatal care late in a pregnancy. These factors included social and economic factors, language problems, and difficulty in getting appointments, transportation, and waiting time within a clinic.

Within the clinic, there could also be barriers to prevent women coming for their visits. These included: clean settings, children play areas, and privacy. Women wanted clinics to allow significant others to attend appointments and to employ respectful staff. In addition, women wanted to feel comfortable bringing their other children into the facility (Novick, 2009). The amount of time spent with the women during visits was also important; women preferred wait time of less than 30 minutes. However, Novick found the mean wait time for clinic visits to be 51.5 minutes, which might influence women's decisions to return for subsequent prenatal care. Patients believed there needed to be an understandable ratio between the time of receiving care and the wait time (Novick, 2009).

Regarding clinical staff, it was important for the staff and clinicians to speak the primary language of their patients. In addition, it was important to the women to be treated respectfully regardless of race, ethnicity, or income (Novick, 2009). Women believed prenatal care as currently performed was impersonal. The process was described as "mechanistic" or an "assembly line." Many times the patients described that they felt as though as they were treated as a "file" or a "number." When the staff members were regarded as unfriendly and harsh, patients felt unconnected to the clinic (Novick, 2009).

An additional enabling factor was finances, including a lack of Medicaid or private insurance. Women who enrolled in Medicaid during the first trimester or later were at an elevated risk of inadequate prenatal care. Comparably, women who enrolled in managed care plans received adequate care due to being enrolled before pregnancy. Egerter, Braveman, and Marohi (2002) found women who generally fell below or at 200% of the poverty level were uninsured just before pregnancy, and one fifth were

uninsured throughout their first trimester. The percentage of women covered by private insurance was overall constant. Egerter, Braveman, and Marohi's (2002) research showed that 74% of uninsured woman, 36% of Medicaid, and 17% of those with private insurance had no prenatal care in the first trimester. Women who entered into the second or third trimesters showed an increase in insurance coverage. The increase in coverage occurred among women who were below the poverty level and who obtained Medicaid insurance (Egerter, Braveman, & Marchi, 2002).

In general, there were striking differences in timeliness of prenatal care, type of insurance, and timing of prenatal coverage. Untimely initiation was common among uninsured women who had no coverage until after their first trimester. Untimely initiation was defined as women who received prenatal care after the first trimester. Women with continuous coverage appeared to be at a low risk of untimely care. Women with no Medicaid coverage during their first trimester received no first trimester (66%) prenatal care visit. As compared to women who had private insurance, 64% began prenatal care during their first trimester, 10% began after their first trimester, and 16% with continuous private coverage had untimely care (Egerter et al., 2002).

In summary, the percentages of women who had a less than adequate number of visits appeared lowest among those who obtained Medicaid coverage at any time during their pregnancy. Overall, two-thirds of low-income women who lacked coverage during their first trimester had untimely initiation of prenatal care; however relatively one in ten women who obtained coverage during the first trimester initiated care at a point after that trimester because of the timing involved to become Medicaid eligible. When controlling

for socio-demographic characteristics, previous uninsured women who obtained Medicaid or private coverage during the first trimester had rates of untimely care that were lower than those observed among low income privately insured women with coverage (Egerter et al., 2002).

Another type of barrier was related to service, which included transportation, waiting too long to get an appointment, waiting too long in the waiting room, or having childcare. Service barriers, according to the San Antonio study, were the most significant factors influencing the decision of low-income women to initiate prenatal care (Sunil et al., 2010). Coincidentally, women who initiated late prenatal care in pregnancy had the highest odds of reporting service related barriers to receiving care (Sunil et al., 2010).

One of the first disparities noted by Novick (2009) was the availability of services located at the facility. These services were inhibited by transportation difficulties. In addition, any additional services covered by insurance might not be offered for those who were in financial difficulties or did not have insurance. When the prenatal care facility included transportation and babysitting, there were fewer external barriers to receiving care (Novick, 2009). In addition to availability of services, Byrd et al. (1996) found many pregnant women believed the prenatal visits were painful and embarrassing. In many of these visits, the women initiated prenatal care after their first trimester (Byrd et al., 1996).

Reinforcing Factors

The last form of barriers related to reinforcing factors. These factors included attitudes and behaviors of heath providers, peers, parents, and employees. According to the Alcalay et al. study (1993), most women got health information from the radio. In

this population, health information could be relayed via mass media, interpersonal communication with laypersons, and interpersonal communication with health professionals. Women frequently acquired health information from health pamphlets and magazines. Hispanic women commonly read health information pamphlets especially those from health care sites. Communication with lay people, such as among friends, was important for Hispanic women. Women who started using prenatal care services early in their pregnancy were more likely to watch television, obtain information from physicians, and were more educated. Less educated women were more likely to listen to the radio (Alcalay, Ghee, & Scrimshaw, 1993). Elder, Ayala, Parra-Medina, and Talavera (2004) confirmed the most common form of health communication was primarily print (newspaper or pamphlets) and radio although Hispanic women watched television when it was available to them (Elder, Ayala, Parra-Medina, & Talavera, 2004).

Literature Review of Methods

In this study, quantitative data using surveys or questionnaires were analyzed. A questionnaire was given to the sample population at the Starr County Community Action Council of South Texas (CACST). Most often questionnaires have been used to collect primary quantitative data from patients and healthcare professionals (McColl et al., 2001). Surveys and questionnaires commonly have answered research questions asking who, what, where, how many, and how much (Yin, 2009).

In developing a questionnaire, the choice and order of response categories can have an impact on the nature and quality of responses. The researchers need to keep in mind that the survey respondents deal with a wide range of cognitive processes when

formulating their responses. To minimize bias in the survey, careful attention must be given to these issues. The main objective of the survey is to collect reliable, valid, and unbiased data from the sample. The data from the survey need to be gathered in a timely manner and within given resource constraints. Overall, research including surveys need to take into account the aims of the study, the sample population, resources available, and the tradeoffs between the ideal and the possible (McColl et al., 2001).

The most common correlation test was the Pearson product moment method. Tests of correlation were used to examine two sets of scores to find the extent of their relationship to one another. This test was commonly used on parametric data, which described ratio and interval data. Another inferential test using parametric data is the Analysis of Variance (Bailey, 1997).

During the analysis, an Analysis of Variance (ANOVA) table was used to analyze the data from the survey. The ANOVA method described the relationship between a continuous dependent variable and one or more nominal independent variables. The basic information on the ANOVA table consisted of several estimates of variance. In return, these estimates could be used to answer inferential questions of regression analysis. Regression analysis was a statistical tool for evaluation of the relationship of one or more independent variables to a single, continuous dependent variable. Commonly, regression analysis was used when the independent variables cannot be controlled, such as when the variables are collected in a survey or observational study. The application of regression analysis in this study would be used to describe a quantitative relationship between several independent variables in predicting a dependent variable (Kleinbaum, Kupper, Nizam, & Muller, 2008).

CHAPTER III

RESEARCH METHOD, DESIGN, AND PROCEDURES

Introduction

Participants not in the *Healthy Start* program in four counties in South Texas were surveyed when seeking initial prenatal care at four Federally Qualified Health Centers located in Cameron County, Hidalgo County, Willacy County, and Starr County. The four Federally Qualified Health Centers included Brownsville Community Health Center, Community Action Council of South Texas, Nuestra Clinica del Valle, and Su Clinica Familiar. Results from this study were used to study the issue of barriers to earlier prenatal care. Data were collected through qualitative methods, while the data were analyzed quantitatively. For the purpose of this study, data from the Community Action County of South Texas (CACST) clinic located in Starr County were analyzed. The choice of choosing CACST was due to the high disparity seen among the county. Understanding the barriers to not receiving prenatal care in this county could help initiate educational programs in the Lower Rio Grande Valley.

Research Design

The research design chosen was a quantitative, historical case study. This research proposal was reviewed and exempted by the Internal Review Board (IRB) at Texas State University-San Marcos. Staff at the CACST gathered the data

and submitted to an external evaluator on a monthly basis. Before sending the data to the evaluator, all personal identifiers were removed and thus the patient information remained confidential. The database was an Excel spreadsheet that allowed for ease in manipulating columns for analysis. For this analysis, years of 2006 - 2009 were selected after the secondary data were put into the Excel spreadsheet. It was given to the researcher to analyze quantitatively through the Pearson product moment correlation and ANOVA method.

Procedures

Each month a survey was given to 25 non-*Healthy Start* women who initiated prenatal care at CACST. The survey included questions on the women's self-reported length of gestation (in weeks) as well as the woman's age (in years). The survey also included a listing of 17 factors that could prevent a woman from seeking early prenatal care. The women selected the items that were barriers for their coming to the clinic earlier. Clinic staff collected the surveys as the women entered the exam room and batched the surveys for submitting to the external evaluator. The survey was written in English and Spanish on a double-side format. Women completed the survey while waiting for their initial examination. The instrument remained confidential, and a woman's decision not to complete the survey did not affect her receiving prenatal care.

Participants

The participants in the survey were pregnant women who received prenatal care at the Community Action Council of South Texas (CACST) during the years of 2006-2009. The women were not a part of the *Healthy Start* program. The women filled out the survey anonymously. Twenty-five women, randomly chosen, completed the survey each

month for a period of four years. There were 698 pregnant women who returned the survey. The pregnant women ranged from ages 16-44 years.

Instruments

A 17-item survey was developed to capture pregnant women's reasons for not seeking earlier prenatal care. The survey included self-reported weeks of pregnancy and woman's age. Both the English and Spanish versions of the instrument were on the same page in a double-sided format. The instrument was initially developed by the *Healthy Start* program director with input from health providers, case managers, clients, and then pilot tested for six months. The general format of the survey has remained constant for over a decade. The reliability of the data according to the external evaluator was 87%. Data from the survey was then entered into Microsoft Excel and analyzed using SPSS.

Data Collection Procedures

The survey was given to patients when they came to CACST for their initial prenatal visit. The survey asked for the age of the patient, the trimester of pregnancy the patient believed she was in, and any barriers for not coming into the clinic earlier. The barriers listed on the survey were in a checklist format for the patient to check all barriers that kept her from getting prenatal care as early as she wanted. She was to check all that applied. There were 17 barriers listed on survey. The clinic personnel collected the survey and batched surveys were sent to an external evaluation for analysis.

Data Analysis

After receiving the data via Microsoft Excel, SPSS was used to build Pearson product moment method and ANOVAs of the information collected. Preliminary results were conducted before doing the ANOVAs to identify the barriers that were significantly

correlated with the age cohorts selected. The significantly correlated barriers were analyzed by ANOVAs. In addition to the barriers analyzed, the ages of the patients were grouped into three cohorts. The cohorts were 16-24 years, 25-34 years, and 35-44 years. In addition to the age cohorts, the trimesters of pregnancy were analyzed with the significantly correlated barriers. The trimester of pregnancy were divided into weeks of gestation with the first trimester falling into 1-12 weeks, second trimester 13-24 weeks, and third trimester 25-40 weeks.

The ANOVA showed the statistically significant barriers within Starr County. After finding the statistically significant barriers, these barriers were analyzed against the three age cohorts. In addition, the barriers were analyzed against the trimester of pregnancy. This data showed the statically significant relationship among barriers within the county, within each age cohort, and within each trimester upon receiving care.

After analyzing the statistically significant barriers between and within the age cohorts and trimester of pregnancy, recommendations were developed for CACST. These recommendations were based on barriers that were found to be statistically significant. Recommendations included providing transportation to patients, flexible business hours for patients, and educational classes on prenatal care topics. In addition, community interventions or programs focusing on educational initiatives and knowledge of prenatal care were recommended.

CHAPTER IV

RESULTS AND DISCUSSION

Introduction

This study focused on Starr County, Texas located in the Lower Rio Grande Valley. Among this area there were many health disparities, economic, and social disadvantages within the population. The problem statement for this study was: what inhibited the decision of Hispanic mothers of Starr County to not receive prenatal care at an earlier time in their pregnancies? The research questions for this study were: What were the barriers for seeking prenatal care? Was there a significant relationship between certain barriers in receiving prenatal care and age cohorts? Was there a significant relationship between barriers among receiving prenatal care and trimester of pregnancy? Was there a significant relationship between barriers among receiving prenatal care and language of choice?

Through the Pearson product moment correlation, barriers for seeking prenatal care were identified. The significantly correlated barriers were analyzed against age cohorts, trimesters of pregnancy, and language of choice through ANOVAs. After data analysis, recommendations to CACST have been developed according to the statistically significant relationships among barriers and age cohorts, trimesters of pregnancy, and language of choice.

Pearson Product Moment Correlation Preliminary Results

To identify the barriers among receiving early prenatal care, preliminary results were completed using SPSS. There were seventeen choices on the survey for the pregnant women of CACST to choose as to why they were unable to come into the FQHC earlier. The choices were listed as barriers in the SPSS and analyzed through two-tailed Pearson Correlations. In addition to the barriers, the three age cohorts (16-24 years, 25-34 years, and 35-44 years), three trimesters of pregnancy (1-12 weeks, 13-24 weeks, and 25-40 weeks), and the language of choice (Spanish and English) were analyzed. The barriers were submitted into the SPSS as: *no early appointment, no money/insurance, no pregnancy test, irregular periods, too early/too soon to tell, afraid, no transportation, no childcare, no doctor (dr.), other things, other babies didn't need it, didn't need it, parents/boyfriend, family didn't want to go, legal reasons, another doctor (dr.),* and *didn't know*. These barriers were paraphrases of the choices on the survey (see Appendix A for full survey). For the purpose of this study, the barriers were identified as categories during data analysis.

After conducting the Pearson product moment correlations, the significant correlations at the 0.05 levels were identified with an asterisk. The significant correlations at the 0.01 levels were identified with two asterisks. To analyze the data, the significant correlation barriers were grouped per age cohort. The first age cohort of 16-24 years had significant correlations among the barrier categories of *no early appointment, afraid, other things, parents/boyfriend, irregular periods,* and *did not know*. The second age cohort of 25-34 years had significant correlations among the barrier categories of *no early appointment, no money/insurance, no pregnancy test, too early/too*

soon to tell, other things, parents/boyfriend, legal reasons, and *family didn't want to go.* The third age cohort of 35-44 years had significant correlations among the barrier categories of *no money/insurance, afraid,* and *family didn't want to go* (see Appendix B).

In addition to barrier category correlations, the trimesters of pregnancy and language of choice were correlated to the three age groups. In the first age cohort, all three trimesters of pregnancy were significantly correlated. In the second age cohort, all three trimesters of pregnancy were significantly correlated. In the third age cohort, the trimesters of pregnancy significantly correlated were 1-12 weeks and 13-24 weeks. The language of choice significantly correlated for all age cohorts was Spanish (see Appendix C).

According to these significant correlations, the barrier categories of *no early appointment, afraid, other things, parents/boyfriend, didn't know, no money/insurance, no test, too early/too soon to tell, irregular periods, family didn't want to go,* and *legal reasons* were chosen for further analysis. In addition, the barrier category of *no transportation* was chosen because of the significant correlations the barrier had with other significantly correlated barriers. The three age cohorts, trimesters of pregnancy, and language of choice were included for further analysis. The further analyses conducted were ANOVAs between each age cohort and barriers and each trimester of pregnancy cohort and barriers. ANOVAs were conducted within each age cohort, trimesters of pregnancy, and language of choice.

Analysis of Variance Results

To identify a statistical significance between trimesters of pregnancy and barrier categories to receiving early prenatal care, Analysis of Variance (ANOVAs) tables were conducted after Pearson product moment correlations.

ANOVAs were conducted among the barriers categories listed: *no early appt, no money/insurance, no pregnancy test, irregular periods, too early/too soon, afraid, no transportation, other things, family didn't want to go, didn't know,* and *legal reasons*. The trimesters of pregnancy were defined as 1-12 weeks, 13-24 weeks, and 25-40 weeks. These trimesters of pregnancy were analyzed against the barrier categories. Statistically significant barrier categories that were seen during the first trimester (1-12 weeks) were *irregular periods,* and *didn't know* (see Appendix D). A statistically significant barrier category during the second trimester (13-24 weeks) was *no transportation* (see Appendix E). A statistically significant barrier category for the third trimester (25-40 weeks) was *didn't know* (see Appendix F).

In addition, to identify statistical significance between age cohorts and barrier categories of receiving early prenatal care, ANOVAs were conducted. The same barrier categories were analyzed against age cohorts. The age cohorts were defined as 16-24 years, 25-34 years, and 35-44 years. Statistically significant barrier categories were found among the age cohorts. Among the age cohort 16-24 years, *no pregnancy test* and *afraid* were statistically significant barrier categories (see Appendix G). Among the age cohort 25-34 years, there were no statistically significant barrier categories (see Appendix H). A statistically significant barrier category among 35-44 years was *too early/too soon* (see Appendix I).

Furthermore, ANOVAs were conducted to determine statistical significance among age cohorts and trimesters of pregnancy. Among the age cohort 16-24 years, all trimesters of pregnancy were statistically significant (see Appendix J). Among the age cohort 25-34 years, the statistically significant trimesters of pregnancy were 13-24 weeks and 25-40 weeks (see Appendix K). The statistically significant trimester of pregnancy was 25-40 weeks among the age group of 35-44 years (see Appendix L).

The last variable analyzed within the ANOVA tables was language of choice. Language of choice was analyzed against barrier categories, age cohorts, and trimesters of pregnancy. Language of choice was determined by which language (Spanish or English) the participants chose. Among the age cohort 35-44 years, Spanish was found to be a statistically significant variable (see Appendix L). The barrier categories of *irregular periods, didn't know,* and *family didn't want to go* were statistically significant variables among participants who had chosen the Spanish version of the survey (see Appendix M). The barrier category *too early/too soon* was statistically significant among those participants that chose the English version of the survey (see Appendix N).

Discussion of the Results

As described previously, barrier categories in the area were divided into three groups: predisposing factors, enabling factors and reinforcing factors. Predisposing factors were the knowledge of the population, enabling factors were barriers to access to care, and reinforcing factors include attitudes and behaviors of the family, employers, or health providers (Devaney et al., 2000). The enabling factors in this study were the barrier categories *no pregnancy test, language,* and *transportation.* Predisposing factors included the barrier categories *didn't know, legal reasons, irregular periods, afraid,*

and *too early/too soon.* Reinforcing factors included the barrier categories that the *family didn't want to go* and *other things.*

The barrier category, *legal reasons,* was described as a predisposing factor because of the unknown knowledge of the services of FQHC. FQHC was required to provide services such as primary health care for all ages, transportation, after hours care, preventive health and others (Duke, 2006). Among the first trimester (1-12 weeks) survey participants, *legal reasons,* were a barrier category, which prevented earlier prenatal care (see Appendix O).

Other predisposing factors that were statistically significant included the following barrier categories: *didn't know, afraid,* and *too early/too soon*. These barrier categories proved statistically significant when compared with age cohorts (see Appendix P). Among the age cohort 35-44 years, the barrier categories of *too early/too soon* was statistically significant (see Appendix P). In addition, the barrier category *didn't know* was found to be statistically significant among first (1-12 weeks) and third (25-40 weeks) trimesters of pregnancy. The barrier category *afraid* was statistically significant among the age cohort 16-24 years participants (see Appendix P). A high percent of residents in the community (46%) had ninth grade education or below (Sanderson, Brown, McIntyre, 2004). The barrier categories *didn't know, afraid,* and *too early/too soon* were found within low education levels.

According to Byrd et al. (1996), initiating care early was significantly associated with patients older than 24. Considering this research the patients still came into care late in their pregnancy. The current study concluded that the barrier categories of *afraid* and *too early/too soon* occurred because of the low education levels of the population. There

was statistical significance between the age cohort 16-24 years and receiving care within the first trimester (1-12 weeks) (see Appendix Q).

Furthermore, *irregular periods* were seen as a statistically significant barrier category among patients who come into the FQHC during the first (1-12 weeks) (see Appendix O). *Irregular periods* were a predisposing factor, which considered the knowledge of the population. The reproductive health education of the community was a necessity to increase knowledge before, during, and after pregnancy (Robles et al, 2008).

The enabling factors were the barrier categories of *no transportation* and *no pregnancy test*. As stated previously, FQHCs provided transportation for the residents of the community. In addition, FQHCs have provided free pregnancy tests for a number of years. The lack of knowledge of the pregnancy tests and transportation services from the FQHC were barriers to the residents of Starr County, Texas. The barrier category of *no transportation* was statistically significant within those patients coming into the FQHC in their second trimester (13-24 weeks) of pregnancy (see Appendix O). The barrier category of *no pregnancy test* was statistically significant among the age cohort 16-24 years (see Appendix P).

Another enabling factor was language (see Appendix R). The barrier categories of *irregular periods, afraid, family didn't want to go,* and *didn't know* were statistically significant to the patients who chose the Spanish version of the survey. According to McDonald et al. (2008), low education levels and uneven distribution of services were barriers to receiving late or no prenatal care. Barrier categories such as *irregular periods, didn't know,* and *afraid* were barriers that fell into low education levels. The patients who predominantly spoke Spanish in Starr County, Texas, lacked the knowledge of the

services provided by FQHCs. Barrier categories such as *family didn't want to go* was distribution of services barriers. The majority of the population (90.7%) of Starr County, Texas, spoke Spanish at home as a predominant language (Center for Public Policy Priorities, 2007). There was statistical significance between Spanish and the age cohort 35-44 years (see Appendix Q).

Reinforcing factors of the study that showed significant correlations according to the Pearson product moment correlations was the barrier category *other things*. Reinforcing factors included behaviors and attitudes of the community. In the age cohorts 16-24 years and 25-34 years, the barrier category *other things* was significantly correlated. The attitudes and behaviors towards prenatal care were very influential on the younger age cohorts. At age cohorts 16-24 years and 25-34 years the barrier category of *other things* indicated that at this age receiving prenatal care was not a priority.

In addition to finding statistically significant barriers within Starr County, Texas, to receiving early prenatal care, the trimesters of pregnancy and age cohorts were analyzed against each other. Within all three trimesters of pregnancy, the age cohort 16-24 years was statistically significant (see Appendix Q). Among the age cohort 16-24 years, the third trimester (25-40 weeks) showed most statistical significance. The population of Starr County, Texas, had a greater proportion of children and reproductive age adults than any other age cohort. The age cohort of 25-34 years showed a statistical significance with second trimester (13-24 weeks) and third trimester (25-40 weeks). In addition, the age cohort 35-44 years showed a statistical significance to the third trimester (25-40 weeks) (see Appendix Q). McDonald et al. (2008) stated that a mobile population in Starr County, Texas, was a deterrent to early prenatal care.

The statistically significant barrier categories shown through ANOVAs in this study identified barriers that administrators at the CACST should understand and address. The identified barriers prevent women from seeking early prenatal care. The decisions to not seek early prenatal care were identified using the participants' surveys, the significant correlations of Pearson product moment correlations, and statistical significance through ANOVAs. In addition to identifying the barriers that prevented women of Starr County, Texas, from seeking early prenatal care, this study also identified the statistical significance between trimesters of pregnancy and age cohorts. Lastly, the language of choice was identified among the barrier categories, trimesters of pregnancy, and age cohorts.

Recommendations to CACST

After identifying the barrier categories through data analysis, recommendations have been developed for the Community Action Council of South Texas (CACST). The goal of these recommendations is to decrease health disparities in Starr County. The recommendations focus on increasing knowledge of prenatal care, nutrition, organizing transportation services, and better marketing of existing services at CACST. At CACST, the Department of Health and Human Services (HHS) funded the *Healthy Start* Program. The existing *Healthy Start* program, located at CACST, focuses on principles in service delivery, community commitment and involvement, increased access to care, public education, integration of health and social services, and multi-agency participation (Devaney et al. 2000). Current recommendations to CACST are built upon these *Healthy Start* principles.

The first recommendation is to increase knowledge of the women in Starr County to the importance of prenatal care. Prenatal care includes knowledge of exercise, drug and alcohol abuse, medications, workplace issues, labor and delivery, and average weight and measurement of mother and fetus. To increase knowledge of general prenatal care, CACST needs to put in place general prenatal care educational classes for the women of the community. These classes can be held at local public buildings such as public schools, library, or Starr County Memorial Hospital. Community organizations such as school systems, local businesses, local media, Texas Department of State Health Services (Region 8), and Starr County Memorial Hospital Women/Infants/Children (WIC) program can collaborate on this recommendation. These community organizations can be organized to develop a plan to best reach the community through educational classes. The class topic can be taught on a rotating basis. The location of the class can be on a rotating basis for convenience to the community. In this way, all community organizations have the opportunity to provide information about their specialized services.

The second recommendation is to use community health lay workers, or *promotoras*, to serve as liaisons to the community. *Promotoras* are well known and trusted in Starr County. Knowledge of prenatal care and services will be provided to the *promotoras* by CACST. *Promotoras* are influential in the community and can be used to market the monthly educational classes through one-on-one conversations. *Promotoras* can also develop flyers and brochures to be placed around the community at highly visible locations. In addition to trainings of prenatal care, further trainings can be initiated by the *promotoras,* such as disease management, pediatric care, and general

care. By increasing the abilities of *promotoras* to address more educational topics, CACST will be more visible to the community. The trust placed upon *promotoras* by the community can be transferred to CACST through the *promotoras* conversations with the community.

A third recommendation is to develop a marketing plan focusing on the services provided by CACST. Legal status is seen as a barrier to receiving early prenatal care. CACST needs a plan as to how it will let the community know that CACST provides services regardless of inability to pay or legal status. By working with local media, CACST can provide the residents of Starr County with information about their requirements for providing services to all. Staff at CACST needs to also communicate to the patients on a routine basis these requirements, especially if requirements change. The use of governmental services during pregnancy cannot jeopardize legal status, and this knowledge needs to be vocalized to the community. *Promotoras* can also use one-on-one visits to assist the residents into receiving services.

A fourth recommendation includes providing a reliable transportation service for CACST patients. As transportation is a statistically significant barrier to this study, knowledge of this service is not well known to the community. CACST is mandated by its funding source to provide transportation to the patients. Transportation hours and routes needs to be organized by CACST and community organizations, so all residents can benefit. CACST should urge organizations that have vehicles to provide transportation for patients. In addition, CACST staff needs to organize the computer system by home addresses. This way, staff can begin making appointments for patients within the same location in Starr County. CACST can provide the hours and routes

decided upon and relay the information to the residents. The hours and routes can be marketed through transportation route/time cards that can be kept in wallets or purses.

A fifth recommendation is to develop patient surveys to determine how patients perceive CACST. These perception surveys can assist CACST in determining the best ways to meet the patient needs. The patient perception surveys seek more in depth information than satisfaction surveys. Novick (2009) found complaints by patients included long, wait times, inability for family to attend appointments, and childcare services, and CACST patients may have similar concerns. While patients wait for their appointment they can be given patient perception surveys. Administrators can use this information to determine information such as the appropriate ratio of wait time/appointment time. Using these methods will help build a clinic that meets patients' needs.

The sixth recommendation is to determine the patients' language of choice. Currently, Spanish is the language of choice for the older population (35-44 years). Acculturation is occurring within the younger population (16-24 years) and the prevalence of English is becoming more significant. To allow the clinic to have a comfortable atmosphere, the staff needs to speak the appropriate language of choice with each patient. Application forms and brochures need to be reviewed by administration to make sure they are designed to be bilingual and are the appropriate reading level. The reading level needs to be assessed due to the low education level within the community.

In conclusion, this study set out to understand what inhibited pregnant women from receiving early prenatal care in Starr County, Texas. After analysis of Pearson product moment correlations and ANOVAS, specific barriers were identified that were

statistically significant to specific ages, trimesters of pregnancy, and language. Based on the data analysis, conclusions were developed and recommendations were generated for CACST. These recommendations were developed based on the statistically significant barriers identified in the study. If implemented, these recommendations should address many of the barriers that women perceive prevent them from seeking early prenatal care at CACST. The recommendations could then be replicated at other FQHC in the Lower Rio Grande Valley in order to address disparity that still exists throughout the region of Texas.

Appendix A

Example of Patient Survey given at CACST

Clinic: CACST

1. How many weeks pregnant were you when you called the clinic to get your first prenatal visit? _____

2. How old are you? _____

3. Please check if any of these things kept you from getting prenatal care as early as you wanted. Check all that apply to you.

    a. I could not get an appointment any earlier.

    b. I did not have enough money or insurance to pay for my visits.

    c. I thought I might be pregnant but I had not found out for with a pregnancy test at a clinic or doctor's office.

    d. I wasn't sure I was pregnant because my periods aren't regular every month

    e. I wasn't sure I was pregnant because it was too early/soon to find out

    f. I was afraid to find out I was pregnant

    g. I had no way (car) to get to the clinic

    h. I could not find a doctor or nurse-midwife who would take me as a patient

    i. I had no one to take care of my children to go to my prenatal visits

    j. I had too many other things going on

k. I have had other babies and did not feel I needed prenatal care

l. I did not think I needed to seek prenatal care

m. My parents/boyfriend didn't know I was does not know I am pregnant

n. My family (parents, husband, boyfriend, etc) did not want me to go.

o. For legal reasons, I was afraid to go to the clinic

p. I was going to another doctor/clinic for services

q. I did not know I was pregnant

Thank you, your answers will help us to give better services to you and others.

Appendix B

Table 1:

Pearson Product Moment Correlations Barriers to not Receiving Early Prenatal Care

Barriers to not Receiving Prenatal Care Earlier

	no early appt	no insurance	no preg test	irreg periods	too soon	afraid	no transport	childcare	no dr	other things
no early appt	1	0.056	0.052	0.2	0.159	0.118	0.245	0.206	0.13	0.182
no insurance	0.056	1	.580**	0.289	0.279	.454**	.513**	.436**	.444**	0.103
no preg test	0.052	.580**	1	.600**	.618**	.389*	.487**	0.304	.695**	0.277
irreg periods	0.2	0.289	.600**	1	0.279	.490**	.360*	0.253	.572**	0.315
too soon	0.159	0.279	.618**	0.279	1	0.059	0.112	0.102	.456**	.324*
afraid	0.118	.454**	.389*	.490**	0.059	1	.357*	0.307	.396*	0.265
no transport	0.245	.513**	.487**	.360*	0.112	.357*	1	.408**	.586**	-0.001
childcare	0.206	.436**	0.304	0.253	0.102	0.307	.408**	1	0.244	0.223
No Dr.	0.13	.444**	.659**	.572**	.456**	.396*	.586**	0.244	1	0.052
other things	0.182	0.103	0.277	.315*	.324*	0.265	-0.001	0.223	0.052	1
other babies	0.064	0.212	0.073	-0.068	0.037	0.149	0.014	0.281	-0.021	0.119
didn't need it	.335*	0.002	0.192	0.175	0.292	0.018	-0.128	.312*	0.073	0.164
parents /bf	.314*	.374*	.467**	.479**	0.295	.320*	.339*	0.225	.453**	0.144
family	-0.102	0.206	.329*	.393*	-0.002	0.123	.413**	0.288	.336*	0.192
legal reasons	-0.211	0.029	0.028	0.264	-0.1	0.223	0.14	-0.109	0.126	-0.201
another dr	.455*	0.286	0.171	0.125	0.146	0.045	0.206	0.222	-0.004	0.087
didn't know	0.18	0.28	.543**	.376*	.643**	.378*	.373*	.378*	.367*	.530**
16-24 years	.347*	0.174	0.21	.383*	0.153	.325*	0.14	0.162	0.169	.358*
25-34 years	.392*	.395*	.422**	0.188	.365*	0.239	0.164	0.157	0.171	.479**
35-44 years	0.137	.593**	0.233	0.018	0.073	.377*	0.151	0.205	0.212	0.6
1-12 weeks	0.279	.381*	.376*	0.281	.390*	.419**	0.06	0.127	0.266	.311*
13-24 weeks	0.279	0.212	0.195	0.263	0.006	0.228	0.231	0.161	0.114	.351*
25-40 weeks	.475**	0.256	0.192	0.046	0.184	0.032	0.108	0.236	-0.008	.427**
spanish	.385*	.421**	.355*	0.3	0.271	.326*	0.183	0.225	0.219	.439**
english	0.305	-0.152	0.165	0.125	0.117	.418**	0.061	-0.16	0.01	0.153

N = 41 *p=0.05 **p=0.01 (continued)

Table 1: Continued

Pearson Product Moment Correlations Barriers to not Receiving Early Prenatal Care

Barriers to not Receiving Early Prenatal Care

	other babies	didn't need it	parents/bf	family	legal reasons	another dr	didn't know
no early appt	0.064	.335*	.314*	-0.102	-0.211	.455**	0.18
no insurance	0.212	0.002	.374*	0.206	0.029	0.286	0.28
no preg test	0.073	0.192	.467**	.329*	0.028	0.171	.543**
irreg periods	-0.068	0.175	.479**	.393*	0.264	0.125	.376*
too soon	0.037	0.292	0.295	-0.002	-0.1	0.146	.643**
afraid	0.149	0.018	.320*	0.123	0.223	0.045	.378*
no transport	0.014	-0.128	.339*	.413**	0.14	0.206	.373*
childcare	0.281	.312*	0.225	0.288	-0.109	0.222	.378*
No Dr.	-0.021	0.073	.453**	.336*	0.126	-0.004	.367*
other things	0.119	0.164	0.144	0.192	0.192	0.087	.530**
other babies	1	.343*	0.188	-0.115	-0.171	0.134	0.113
didn't need it	.343*	1	0.214	0.013	-0.113	0.086	0.139
parents /bf	0.188	0.214	1	0.156	0.061	0.262	0.166
family	-0.115	0.013	0.156	1	0.143	-0.112	0.094
legal reasons	-0.171	-0.113	0.061	0.143	1	-.348*	0.005
another dr	0.134	0.086	0.262	-0.112	-.348*	1	0.242
didn't know	0.113	0.139	0.166	0.094	0.005	0.242	1
16-24 years	0.116	.378*	.352*	0.055	0.194	0.282	.324*
25-34 years	0.1	0.247	.406**	0.021	-.373*	.552**	.312**
35-44 years	0.132	-0.032	0.215	0.066	-0.112	.318*	0.046
1-12 weeks	0.171	0.248	.505**	-0.172	-0.014	.352*	.361*
13-24 weeks	-0.032	0.133	0.212	0.275	-0.174	.414**	0.172
25-40 weeks	0.2	.483**	0.168	0.111	-0.145	.403**	0.193
Spanish	0.145	.314*	.428**	0.081	-0.109	.493**	.320*
English	-0.045	0.202	0.146	-0.245	0.08	0.026	0.245

n= 41 *p=0.05 **p=0.01

Appendix C

Table 2:

Age, Trimesters, and Language vs. Barriers to not Receiving Early Prenatal Care

	Age in Years			Trimesters of Pregnancy			Language of Choice	
	16-24 year s	25-34 years	35-44 years	1-12 weeks	13-24 weeks	25-40 weeks	spanish	english
no early appt	.347*	.392*	0.137	0.279	0.279	.475**	.385*	0.305
no insurance	0.174	.395*	.593**	.381*	0.212	0.256	.421**	-0.152
no preg test	0.21	.422**	0.233	.376*	0.195	0.192	.355*	0.165
irreg periods	.383*	0.188	0.018	0.281	0.263	0.046	0.3	0.125
too soon	0.153	.365*	0.073	.390*	0.006	0.184	0.271	0.117
afraid	.325*	0.239	.377*	.419**	0.228	0.032	.326*	.418**
no transport	0.14	0.164	0.151	0.06	0.231	0.108	0.183	0.061
childcare	0.162	0.157	0.205	0.127	0.161	0.236	0.225	-0.16
No Dr.	0.169	0.171	0.212	0.266	0.114	-0.008	0.219	0.01
other things	.358*	.479**	0.06	.311*	.351*	.427**	.439**	0.153
other babies	0.116	0.1	0.132	0.171	-0.032	0.2	0.145	-0.045
didn't need it	.378*	0.247	-0.032	0.248	0.133	.483**	.314*	0.202
parents /bf	.352*	.406**	0.215	.505**	0.212	0.168	.428**	0.146
family	0.055	0.021	0.066	-0.172	0.275	0.111	0.081	-0.245
legal reasons	0.194	-.373*	-0.112	-0.014	-0.174	-0.145	-0.109	0.08
another dr	0.282	.552**	.318*	.352*	.414**	.403**	.493**	0.026
didn't know	.324*	.312*	0.046	.361*	0.172	0.193	.320*	0.245
16-24 years	1	.502**	0.189	.695**	.662**	.597**	.842**	0.173
25-34 years	.502**	1	.433**	.717**	.681**	.562**	.852**	0.201
35-44 years	0.189	.433**	1	.517**	.377*	0.172	.515**	-0.047
1-12 weeks	.695**	.717**	.517**	1	.418**	0.302	.816**	.347*
13-24 weeks	.662**	.681**	.377*	.418**	1	.466**	.801**	-0.032
25-40 weeks	.597**	.562**	0.172	0.302	.466**	1	.660**	-0.032
spanish	.842**	.852**	.515**	.816**	.801**	0.66	1	0.081
english	0.173	0.201	-0.047	.347*	-0.032	-0.032	0.081	1

N = 41 *p=0.05 **p=0.01

Appendix D

Table 3:

ANOVA Table of Trimester 1-12 weeks vs. Barriers of not Receiving Early Prenatal Care

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	sig
no early appt	0.440	0.329	0.223	1.338	0.191
no insurance	0.309	0.226	0.265	1.367	0.182
no preg test	0.257	0.430	0.162	0.599	0.554
irreg periods	0.022	0.564	0.008	0.039	0.969
too soon	0.393	0.612	0.156	0.643	0.526
afraid	0.777	0.578	0.259	1.345	0.189
no transport	-0.511	0.488	-0.233	-1.047	0.304
other things	1.003	1.377	0.139	0.728	0.472
family not want	-2.778	2.125	-0.232	-1.307	0.201
legal reasons	0.102	0.235	0.07	0.435	0.667
didn't know	-0.027	0.794	-0.008	-0.034	0.973

dependent variable: 1-12 weeks

Appendix E

Table 4:

ANOVA Table of Trimester 13-24 weeks vs. Barriers of not Receiving Early Prenatal Care

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	sig
no early appt	0.302	0.26	0.221	1.159	0.256
no insurance	0.102	0.179	0.126	0.572	0.572
no preg test	0.053	0.34	0.048	0.155	0.878
irreg periods	0.145	0.447	0.079	0.326	0.747
too soon	-0.407	0.484	-0.233	-0.84	0.408
afraid	0.075	0.457	0.036	0.165	0.87
no transport	0.011	0.386	0.007	0.027	0.978
other things	1.193	1.09	0.24	1.095	0.282
family not want	1.587	1.681	0.191	0.944	0.353
legal reasons	-0.166	0.186	-0.165	-0.892	0.379
didn't know	0.068	0.628	0.03	0.108	0.914

dependent variable: 13-24 weeks

Appendix F

Table 5:

ANOVA Table of Trimester 25-40 weeks vs. Barriers of not Receiving Early Prenatal Care

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	sig
no early appt	0.558	0.146	0.596	3.811	0.001
no insurance	0.176	0.101	0.318	1.75	0.091
no preg test	0.244	0.191	0.325	1.276	0.212
irreg periods	-0.469	0.251	-0.373	-1.866	0.072
too soon	-0.206	0.273	-0.172	-0.756	0.456
afraid	-0.303	0.257	-0.213	-1.178	0.248
no transport	-0.215	0.217	-0.207	-0.990	0.330
other things	1.527	0.613	0.448	2.491	0.019
family not want	0.828	0.946	0.146	0.875	0.389
legal reasons	0.131	-0.105	0.190	1.254	0.22
didn't know	-0.036	0.354	-0.023	-0.101	0.921

dependent variable: 25-40 weeks

Appendix G

Table 6:

ANOVA Table of Age Cohort 16-24 years vs. Barriers to not Receiving Early Prenatal Care

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	sig
no early appt	0.657	0.342	0.348	1.920	0.065
no insurance	0.152	0.235	0.136	0.647	0.523
no preg test	0.045	0.447	0.030	0.100	0.921
irreg periods	0.374	0.587	0.147	0.637	0.529
too soon	-0.343	0.637	-0.142	-0.538	0.595
afraid	0.050	0.601	0.017	0.083	0.934
no transport	-0.327	0.508	-0.156	-0.644	0.525
other things	1.680	1.433	0.244	1.172	0.251
family not want	-0.533	2.211	-0.046	-0.241	0.811
legal reasons	0.393	0.245	0.283	1.608	0.119
didn't know	0.52	0.826	0.168	0.629	0.534

dependent variable: 16-24 years

Appendix H

Table 7:

ANOVA Table of Age Cohort 25-34 years vs. Barriers of not Receiving Early Prenatal Care

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	sig
no early appt	0.504	0.254	0.300	1.982	0.057
no insurance	0.229	0.174	0.231	1.311	0.200
no preg test	0.463	0.332	0.344	1.395	0.174
irreg periods	-0.344	0.436	-0.153	-0.789	0.437
too soon	0.109	0.473	0.051	0.231	0.819
afraid	0.187	0.447	0.073	0.418	0.679
no transport	-0.099	0.377	-0.053	-0.263	0.794
other things	2.321	1.064	0.379	2.180	0.037
family not want	-0.650	1.642	-0.064	-0.396	0.695
legal reasons	0.251	0.182	-0.203	-1.381	0.178
didn't know	-0.469	0.614	-0.170	-0.765	0.45

dependent variable 25-34 years

Appendix I

Table 8:

ANOVA Table of Age Cohort 35-44 years vs. Barriers of not Receiving Early Prenatal Care

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	sig
no early appt	0.131	0.096	0.219	1.369	0.182
no insurance	0.222	0.066	0.628	3.388	0.002
no preg test	0.035	0.125	0.072	0.277	0.783
irreg periods	-0.238	0.164	-0.296	-1.450	0.158
too soon	-0.015	0.178	-0.02	-0.086	0.932
afraid	0.304	0.168	0.333	1.809	0.081
no transport	-0.195	0.142	-0.293	-1.376	0.179
other things	-0.119	0.400	-0.054	-0.296	0.769
family not want	0.585	0.617	0.161	0.948	0.351
legal reasons	-0.034	0.068	-0.077	-0.497	0.623
didn't know	-0.085	0.231	-0.087	-0.37	0.714

dependent variable: 35-44 years

Appendix J

Table 9:

ANOVA Table of Age Cohort 16-24 years vs. Trimesters of Pregnancy and Language of Choice

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	sig
1-12 weeks	-0.118	0.900	-0.123	-0.131	0.897
13-24 weeks	-0.103	0.925	-0.075	-0.112	0.912
25-40 weeks	0.067	0.926	0.033	0.072	0.943
Spanish	0.554	0.901	0.970	0.614	0.543
English	0.694	0.955	0.136	0.726	0.472

dependent variable: 16-24 years

Appendix K

Table 10:

ANOVA Table of Age Cohort 25-34 years vs. Trimesters of Pregnancy and Language of Choice

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	sig
1-12 weeks	-0.202	0.772	-0.238	-0.262	0.795
13-24 weeks	-0.155	0.794	-0.126	-0.195	0.847
25-40 weeks	-0.157	0.795	-0.087	-0.197	0.845
Spanish	0.603	0.774	1.190	0.780	0.441
English	0.813	0.82	0.180	0.992	0.328

dependent variable: 25-34 years

Appendix L

Table 11:

ANOVA Table of Age Cohort 35-44 years vs. Trimesters of Pregnancy and Language of Choice

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	sig
1-12 weeks	0.297	0.439	0.978	0.676	0.503
13-24 weeks	0.211	0.451	0.483	0.469	0.642
25-40 weeks	0.076	0.451	0.119	0.169	0.867
Spanish	-0.131	0.439	-0.724	-0.298	0.767
English	-0.498	0.465	-0.309	-1.071	0.292

dependent variable: 35-44 years

Appendix M

Table 12:

ANOVA Table of the Language Spanish vs. Barriers of not Receiving Early Prenatal Care

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	sig
no early appt	1.167	0.562	0.353	2.079	0.047
no insurance	0.733	0.385	0.374	1.900	0.067
no preg test	0.374	0.734	0.141	0.510	0.614
irreg periods	-0.051	0.964	-0.011	-0.053	0.958
too soon	-0.226	1.045	-0.053	-0.216	0.831
afraid	0.21	0.986	0.042	0.213	0.833
no transport	-0.623	0.833	-0.169	-0.747	0.461
other things	3.810	2.351	0.316	1.620	0.116
family not want	-0.034	3.627	-0.002	-0.009	0.993
legal reasons	0.066	0.401	0.027	0.163	0.871
didn't know	-0.033	1.356	-0.006	-0.024	0.981

dependent variable: Spanish

Appendix N

Table 13:

ANOVA Table of the Language English vs. Barriers of not Receiving Early Prenatal Care

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	t	sig
no early appt	0.109	0.056	0.295	1.965	0.059
no insurance	-0.14	0.038	-0.638	-3.664	0.001
no preg test	0.168	0.073	0.565	2.317	0.028
irreg periods	-0.165	0.096	-0.331	-1.726	0.095
too soon	-0.01	0.104	-0.022	-0.100	0.921
afraid	0.338	0.098	0.599	3.462	0.002
no transport	0.027	0.083	0.064	0.322	0.75
other things	0.102	0.233	0.076	0.439	0.664
family not want	-0.607	0.36	-0.269	-1.689	0.102
legal reasons	0.039	0.04	0.141	0.972	0.339
didn't know	-0.039	0.134	-0.064	-0.291	0.773

dependent variable: English

Appendix O

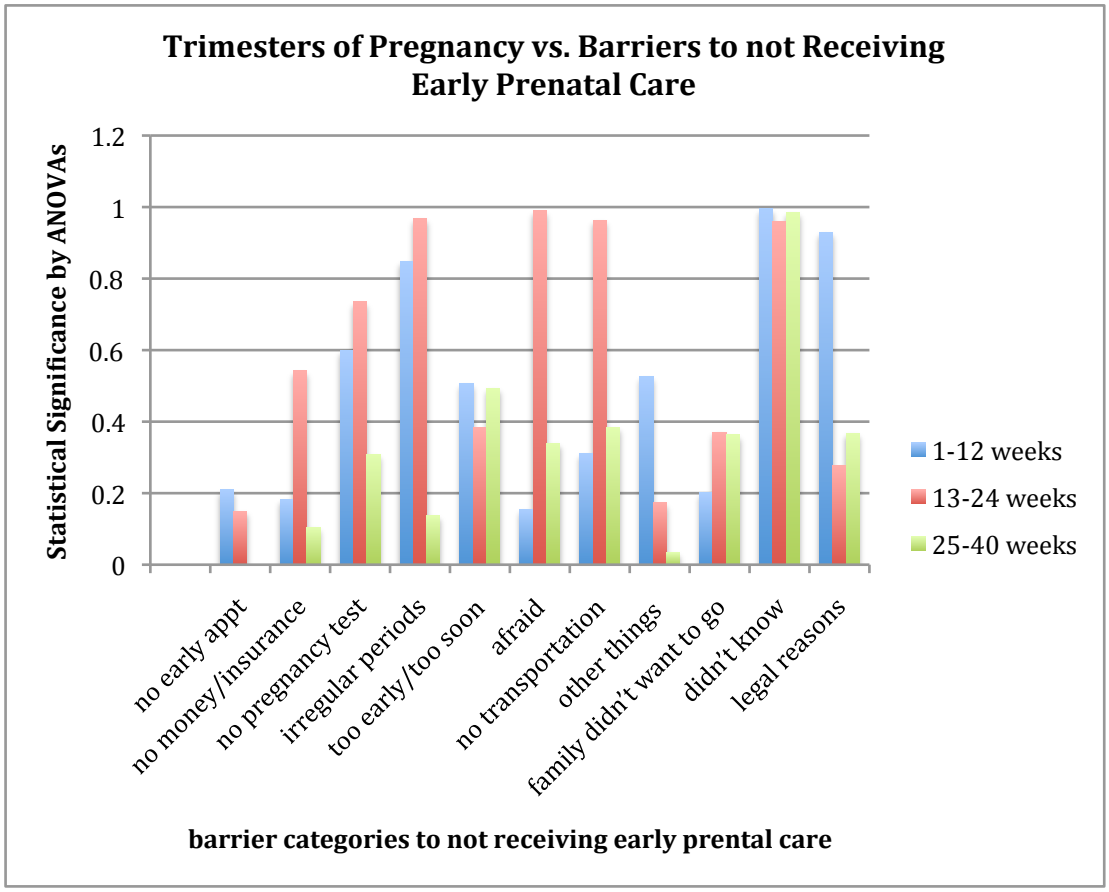

Figure 1: Bar graph of trimesters of pregnancy vs. barriers to not receiving early prenatal care. Statistically significant barriers were identified through a 95% confidence interval. The statistically significant barriers identified in the trimester of pregnancy 1-12 weeks were *irregular periods* and *didn't know.* The statistically significant barrier identified in the trimester of pregnancy 13-24 weeks was *no transportation.* The statistically significant barriers identified in the trimester of pregnancy 25-40 weeks was *didn't know.*

Appendix P

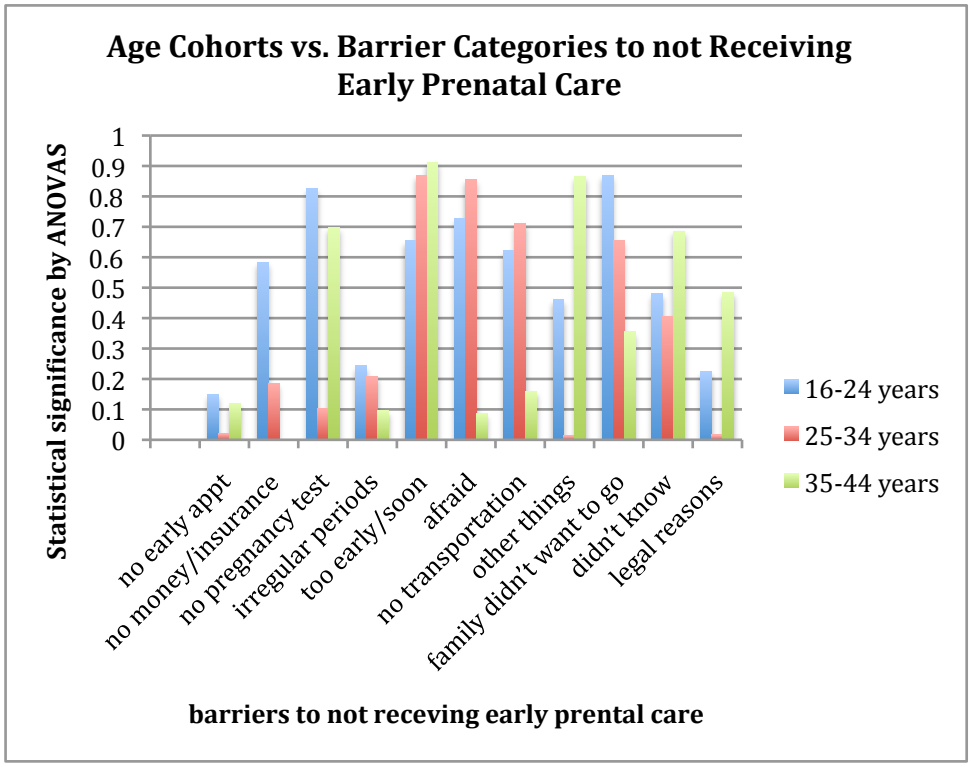

Figure 2: Bar graph of age cohorts vs. barrier categories to not receiving early prenatal care. Statistically significant barriers are identified by a 95% confidence interval. Statistically significant barriers at the 16-24 years age cohort were *no pregnancy test and afraid.* Statistically significant barriers at the 35-44 years age cohort was *too early/soon.*

Appendix Q

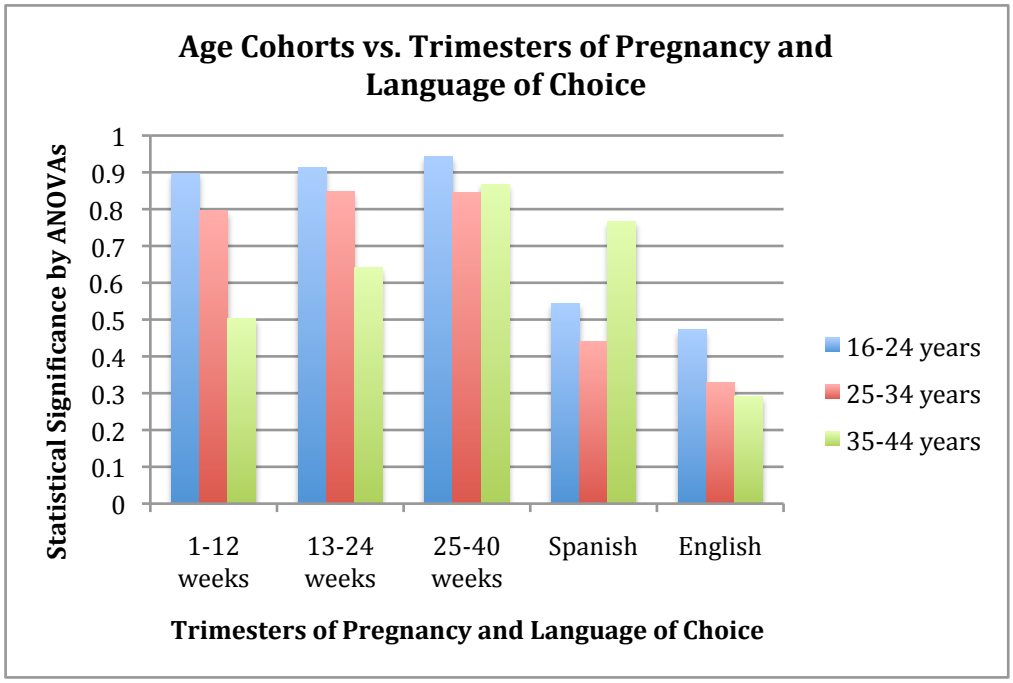

Figure 3: Bar graph of age cohorts vs. trimesters of pregnancy and language of choice. Statistically significant trimesters of pregnancy and language of choice were identified at the 95% confidence interval. The statistically significant trimesters of pregnancy at the 16-24 years age cohort were 1-12 weeks, 13-24 weeks, and 25-40 weeks. The statistically significant trimesters of pregnancy at the 25-34 years age cohort were 13-24 weeks and 25-40 weeks. The statistically significant trimesters of pregnancy at the 35-44 years age cohort were 25-40 weeks. Spanish was more significantly spoken within the 35-44 years age cohort.

Appendix R

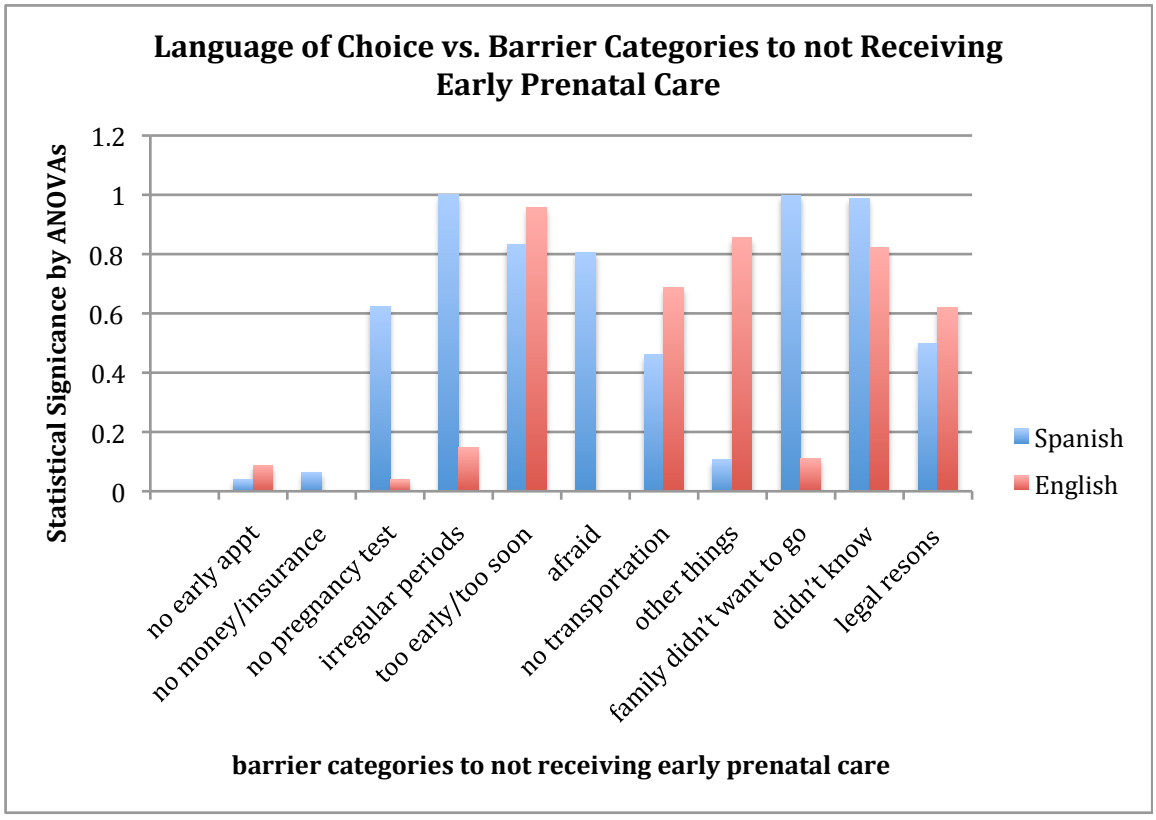

Figure 4: Bar graph of language of choice vs. barrier categories to not receiving early prenatal care. Statistically significant barriers were identified at the 95% confidence interval. Spanish was identified to be statistically significant with the barrier categories *family didn't want to go, irregular periods, and didn't know.* English was identified to be statistically significant with the barrier category *too early/too soon.*

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VITA

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