

Evaluation of Mother and Infant Birth Outcomes
Following the
Rural Oregon Minority Prenatal Project

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ABSTRACT

TITLE: Evaluation of Mother and Infant Birth Outcomes
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This thesis is a retrospective evaluation of mother and infant birth outcomes following the Rural Oregon Minority Prenatal Project (ROMPP). We proposed that when two Hispanic groups were compared, a ROMPP case managed group and a control group, the intervention group would have increased birthweight and gestational age and decreased maternal and infant complications measured in hospital stay hours following delivery. The independent variable was the ROMPP nursing case managed model intervention. Dependant variables included birthweight in grams, gestational age in weeks, and maternal and infant lengths of hospital stay in hours. Two hundred and thirty four low income Hispanic pregnant women who delivered in Malheur County, Oregon were studied. The 102 ROMPP mothers delivered between 1992 to 1994 and the 132 control mothers delivered between 1988 to 1991. A data collection flowsheet was used for hospital chart reviews. The means of each dependant variable were

analyzed using T-test analysis. No significant statistical differences in birth outcomes were noted at $p < .05$.

Limitations included the small sample size and choice of dependent measures. Further research is needed regarding appropriate prenatal care for favorable Hispanic birth outcomes.

Chapter One

Introduction

Adequate prenatal care is a vital component of favorable birth outcomes. The Surgeon General's goal stated 90% of all pregnant women should receive adequate prenatal care by 1990. The statistics suggest a decline rather than improvement. In 1991, only 76.2% of U.S. women received prenatal care in the first trimester (Children's Defense Fund, 1991). The rate of Hispanic women obtaining first trimester prenatal care is even lower. During 1989 to 1991 in Oregon, 65.8% of United States born Hispanic women and 51.2% of foreign born Hispanic women began first trimester care (Oregon Health Division, 1991).

Insufficient prenatal care related to socio-demographic, personal, and system barriers are associated with an increased number of preterm births, low birthweight infants, medical, and obstetrical complications (Curry, 1990). Society pays the price with prolonged infant hospital stays, frequent first year hospital readmissions, and unknown long term developmental effects on the children further taxing our already fragile social and school systems (Brooks-Gunn, McCormick, and Heagarty, 1988).

The United States has seen a rise in Hispanic and Mexican American populations. This ethnic group will be one

of the largest minorities in years to come (Balcazar and Aoyama, 1991). Their health needs must be addressed.

Hispanic women have higher percentages of late entry or no prenatal care in comparison to other ethnic groups. In contrast, the low birthweight infant percentage is one of the lowest (Balcazar et al., 1991). The statistics suggest that interventions to increase the number of prenatal visits would not improve birth outcomes for this population.

Statement of Problem

We proposed that when two Hispanic groups are compared, a Rural Oregon Minority Prenatal Project (ROMPP) case managed group and a control group, the intervention group will have increased birthweight and gestational age; and decreased maternal and infant complications measured in hospital stay hours following delivery.

Chapter Two

Review of the Literature

An extensive literature search in Medline and Cinahl from 1987 to the present, gleaned minimal information regarding specific components of prenatal care which improve infant birthweight or gestational age. Data regarding its effect on infant or maternal hospital length of stay was not found. The need for further research regarding the specific components of prenatal care which improve prenatal outcomes was noted by many authors. The following review of prenatal care covers six divisions: definition of the problem; risk factors for low birthweight infants; prenatal care for Hispanic women; evaluation of barriers to prenatal care: Hispanic women in particular and women in general; suggestions for removal of barriers to prenatal care systems; and models and evaluations of prenatal care programs.

Definition of the Problem

Most authorities define preterm birth as less than 37 weeks gestation (Merkatz, Thompson, Mullen, & Goldenberg, 1990). The consequences to the health of these infants are similar to those of low birthweight (LBW) infants. Low infant birth weights are defined as those weighing less than

2500 grams. These infants comprise about 7% of all births and account for two-thirds of all neonatal deaths (Merkatz et al., 1990). Improvement of prenatal care remains the intervention of choice for reducing the incidence of LBW infants. However, improvement in physical and intellectual outcomes of LBW infants depends on improved social environments for growing and developing children (Illsley & Mitchell, 1984).

Rural communities face two major drawbacks that prevent good perinatal outcomes: transportation problems and poor compliance. Nesbitt, Connel, Hart, and Rosenblatt (1990) found rural Washington women had difficulty traveling to obtain prenatal care and were more inclined to have poorer compliance with prenatal advice. As a result, women traveling to obtain obstetrical care and delivering outside their local community had a greater proportion of complicated deliveries, higher rates of prematurity, and higher costs of neonatal care than women who delivered in their local hospital (Nesbitt et al., 1990). The study may be flawed in that these women may have been referred out of their community due to high risk pregnancies.

Risk Factors for Low Birthweight Infants

Merkatz et al. (1990) specifically define risk factors associated with LBW infants, please see Figure 1.

Figure 1

Principle Risk Factors for Low Birth Weight

- I. Demographic risks
 - A. Age (<17;>34).
 - B. Race (black)
 - C. Low socioeconomic status.
 - D. Unmarried.
 - E. Low level of education.
- II. Medical risk predating pregnancy
 - A. Parity (zero or more than four).
 - B. Low weight for height.
 - C. Genitourinary anomalies\surgery.
 - D. Selected diseases, such as diabetes or chronic hypertension.
 - E. Nonimmune status for selected infections, such as rubella.
 - F. Poor obstetric history, including previous low-birth-weight infant and multiple spontaneous abortions.
 - G. Maternal genetic factors, such as low maternal weight at own birth.
- III. Medical risks in current pregnancy.
 - A. Multiple pregnancy.
 - B. Poor weight gain.
 - C. Short interpregnancy interval.
 - D. Hypotension.
 - E. Hypertension\preeclampsia\toxemia.
 - F. Selected infections, such as symptomatic bacteriuria, rubella, and cytomegalovirus.
 - G. First- or second-trimester bleeding.
 - H. Placental problems, such as placenta previa and placenta abruptio.
 - I. Hyperemesis.
 - J. Oligohydramnios\polyhydramnios.
 - K. Anemia\abnormal hemoglobin.
 - L. Isoimmunization.
 - M. Fetal anomalies.
 - N. Incompetent cervix.
 - O. Spontaneous premature rupture of membranes.
- IV. Behavioral and environmental risks
 - A. Smoking.
 - B. Poor nutritional status.
 - C. Alcohol and other substance abuse.
 - D. Diethylstilbestrol exposure and other toxic exposures, including occupational hazards.
 - E. High altitude.

- V. Health care risks
 - A. Absent or inadequate prenatal care.
 - B. Iatrogenic prematurity.
 - VI. Evolving concepts of risk
 - A. Stress, physical and psychosocial.
 - B. Uterine irritability.
 - C. Events triggering uterine contractions.
 - D. Cervical changes detected before onset of labor.
 - E. Selected infections, such as mycoplasma and chlamydia trachomatis.
 - F. Inadequate plasma volume expansion.
 - G. Progesterone deficiency.
- (Merkatz et al., 1990, p. 507-508)

Prenatal Care for Hispanic Women

Hispanics comprise 8.2% of the total United States population. In rural Oregon, the Hispanic population varies with the amount of seasonal work available. Hispanic mothers have many risk factors for delivering a LBW infant: low socioeconomic status, limited education, and demographic risk factors. Yet, their LBW infant rate is lower than whites. Researchers have a limited understanding of why Hispanic women have improved birthweight compared to whites, considering the universal lack of adequate prenatal care amongst Hispanics. Initiation of prenatal care in this underserved group frequently begins in the third trimester or not at all. However, Balcazar and Aoyama (1991) believe increased prenatal care visits may not make a difference in the incidence of LBW infants, due to Hispanic cultural behaviors which lower their risk of LBW infants. Hispanics decreased incidence of LBW infants may be attributed to

cultural approval of pregnancy and extended family support for pregnant mothers (Balcazar et al., 1991).

Evaluation of Barriers to Adequate Prenatal Care

The literature describes numerous factors which are associated with inadequate prenatal care. Curry (1990) summarized these characteristics into three broad categories: sociodemographic characteristics, personal barriers, and system barriers.

- I. Sociodemographic characteristics:
 - A. Income of less than 200% of federal poverty level.
 - B. Ethnic origin, with Hispanic women receiving the least adequate prenatal care compared to White or Black women.
 - C. Less than a highschool educational level.
 - D. Women at either age extreme, adolescent or greater than 45 years.
 - F. Unmarried.
 - G. Increased parity.
 - H. Geographic location both across and within a community.
 - II. Personal barriers:
 - A. Attitudes and knowledge about pregnancy and prenatal care.
 - B. Culture and lifestyle beliefs regarding prenatal care.
 - C. Personal resources, personality characteristics and social support.
 - III. System barriers:
 - A. Provider availability.
 - B. Transportation.
 - C. Negative institutional practices which make prenatal care difficult for women to accept.
 - D. Dissatisfaction with prenatal care\providers.
- (Curry, 1990, p. 245-249).

Hispanic Women in Particular

Barriers to prenatal care for Hispanic women are financial, cultural, and personal. These women are mostly low income and usually attained a lower educational level. They frequently seek prenatal care only when they are ill, because pregnancy is not a perceived illness in their culture. Thus, prenatal care is often neglected. Financial barriers exist for undocumented and non-resident Hispanics who are self pay because they are ineligible for medical insurance through work and ineligible for medicaid. Fear of immigration reprisals also may increase the reluctance of Hispanics to enter the health care system. The combination of financial, cultural, and legal barriers all contribute to a low desire for or value of prenatal care (Balcazar et al., 1991).

Women in General

Other studies have attempted to understand barriers to adequate prenatal care. Poland, Ager, and Olson (1987) examined the relative effects of demographic, medical, and sociocultural factors on the amount of prenatal care received. For many women social support was lacking in those who received inadequate prenatal care. These women felt isolated from social assistance, because they were

inadequately educated or assisted with how to fill out long medicaid forms. Isolation was enhanced by health care professionals, who were perceived as frightening, hostile, and uncommunicative. On the other hand, those women who received appropriate prenatal care had the social support of friends, family, and professionals (Poland et al., 1987).

Personal attitudes also play a part in receiving little or no prenatal care. Women frequently described negative attitudes about their pregnancy. Prenatal care was felt to be unimportant and little value was placed on health care professionals (Poland et al., 1987).

Another study assessed the barriers to prenatal care within the city of Miami, Florida. Results indicated the main barriers were patient-related, system-related, and financial. They also found LBW infants were more likely to be born to women who received inadequate prenatal care, were unmarried, or black (Scupholme, Robertson, and Kamons, 1991).

Women who received inadequate prenatal care in a midwestern county often attributed this to insufficient money, lack of motivation, and lack of transportation. Prenatal care was inadequate in 15% of the study population as opposed to 9% of the entire United States. Lack of motivation was due to feeling no need for prenatal care, and lack of difficulties with prior pregnancies (Leatherman,

Blackburn, and Davidhizar, 1990).

Maternal reasons for delayed prenatal care fell into five categories for another population of urban Pennsylvanians: acceptance of pregnancy, utilization of prenatal care, financial issues, and family responsibilities. The researchers felt low self-esteem, poor communication patterns, depression, and inability to plan for child bearing were also contributing factors to delayed care. Women who entered prenatal care late often did not want the pregnancy (Young, McMahon, Bowman, and Thompson, 1989).

Suggestions for Removal of Barriers to Prenatal Care Systems

In light of the multiple barriers to prenatal care, the 1988 Institute of Medicine committee recommended strengthening the existing prenatal care system in the following ways:

1. Remove financial barriers to care;
2. Make certain that basic system capacity is adequate for all women;
3. Improve the policies and practices that shape prenatal services at the delivery site; and
4. Increase public information and education about prenatal care.

(Brown, 1988, p. 12)

Unfortunately, even if all four system changes were implemented, there would still be women who receive inadequate prenatal care due to extreme social isolation, youth, fear or denial, drug addiction, or cultural factors.

Outreach services such as casefinding and social support to locate and enroll these women in prenatal care and encourage continuation of care, once begun, is needed for these hard to reach women (Institute of Medicine committee to study outreach for prenatal care, 1988).

Poland et al., (1987) suggested the following steps to minimize barriers to prenatal care. First, the experiences and attitudes of pregnant women receiving prenatal care should be assessed. Secondly, this information should be used to identify structural barriers within the health care system; identify personal\social\cultural barriers for not receiving prenatal care; and to develop outreach efforts which are specific for this "at risk" population (Poland et al., 1987; Scupholme et al., 1991). Monetarily subsidized prenatal care and community education about adequate prenatal care and the consequences of inadequate prenatal care are necessary (Leatherman et al., 1990). Education and social support to improve self esteem, communication patterns and parenting skills may also be helpful (Young, McMahon, Bowman, and Thompson, 1989).

Models and Evaluations of Prenatal Care Programs

Outreach services have been suggested as one way to improve perinatal outcomes. Unfortunately few outreach services have been evaluated in the literature, leaving a

broad array of unanswered questions about the efficacy of outreach services. However, the Harlem Hospital Program in New York used lay persons educated in casefinding to find and identify pregnant women and enroll them in prenatal care clinics. This program was found to be labor intensive and expensive, with little increase in numbers of prenatal care recipients. However, many of these women had high environmental stress and low social support, which would benefit from prenatal interventions aimed at reducing isolation and enhancing their skills as parents (Brooks-Gunn et al., 1988; McCormick, Brooks-Gunn, Shorter, Holmes, Wallace, and Heagarty, 1989).

Developmental approaches to preventing infant mortality have been initiated and evaluated. Prenatal care based on a developmental approach would include: family planning, improved content of prenatal care, health-related behavior education, and access to prenatal care. Family planning may reduce the numbers of LBW babies by preventing unwanted pregnancies. Education about delay of first intercourse, birth control, decision-making skills, and peer counseling are extremely helpful in delaying adolescent pregnancy (Brooks-Gunn et al., 1988).

Improved prenatal services should include nutrition assessment, social service intervention, outreach efforts, childrearing education, and health education components.

However, little evaluation has been done regarding the precise optimal content of prenatal programs (Brooks-Gunn et al., 1988).

Education to improve health behaviors has been shown to be helpful. Nutritional supplementation and proper education about nutrition are imperative during pregnancy. Programs designed to reduce smoking, alcohol, and drug use need to be incorporated within the office visit, with appropriate support-group referrals for social support during the withdrawal from addictive drugs (Brooks-Gunn et al., 1988).

South Carolina utilized an intervention in 1987 for rural, pregnant teens. The target area was associated with poverty, low educational status, poor transportation, and isolation, with large numbers of teen pregnancies and LBW infants. This project used resource mothers who fulfilled essential roles for pregnant adolescents as teacher, role model, reinforcer, friend, and facilitator. Home visits were structured, with specific learning objectives geared toward supplementing and reinforcing the professional services the adolescent received. Resource mothers were involved with teens upon entry into prenatal care and to the first birthday of the infant. Using this intervention, there were significantly more patients with adequate prenatal care, and a significant decrease in LBW and small

for gestational age infants in this population (Heins, Nance, and Ferguson, 1987).

The Prenatal Early Infancy Project, reported by Olds (1988), focused on nurse home visitation to prevent a wide range of maternal and child health problems associated with poverty. Nursing education included:

1. Help women improve their diet and monitor their weight gain.
 2. Help women eliminate the use of cigarettes, alcohol, and drugs.
 3. Teach parents to identify the signs of pregnancy complication.
 4. Encourage regular rest, appropriate exercise, and good personal hygiene related to obstetrical health.
 5. Prepare parents for labor and delivery,.
 6. Prepare parents for the early care of the newborn.
 7. Encourage appropriate use of the health care system.
 8. Encourage mothers to make plans regarding subsequent pregnancies, returning to school, and finding employment.
- (Olds, 1988, p. 14-15).

This intervention led to improvements in infant birth weight, especially for very young teenagers, and a reduction in preterm delivery for those women who smoked (Olds, 1988). Further, nurse visited mothers improved in the following ways: became aware of more community services; attended childbirth classes more frequently; used nutritional supplementation programs for women, infants, and children more extensively; improved their diets; reported baby's father became more interested in the pregnancy; were accompanied to the hospital by a support person during labor

more frequently; talked more frequently to family members, friends, and service providers about their pregnancies and personal problems; and had fewer kidney infections (Olds, Henderson, Tatelbaum, and Chamberlin, 1986).

In North Carolina the Prematurity Prevention Project featured standardized risk assessments for all patients; education for patients and providers; intensive prenatal care for patients at risk with weekly visits and cervical examinations post 24 weeks gestation; and assessment of uterine activity of patients with signs of preterm labor, followed by appropriate treatment. Women at high risk for LBW infants, Black, unmarried, or in other high risk categories, generally had higher percentages of LBW infants. Higher risk women appeared to benefit more from this project than their counterparts, due to higher overall live birthweights of infants. However, the program also appeared to reduce the number of LBW infants among patients who are seen in private practices, who on average are at lower risk than the indigent population frequently targeted by prenatal programs (Buescher, Meis, Ernest, Moore, Michielutte, and Sharp, 1988).

The benefit of prenatal care programs provided by a large county public health department was found when outcomes for Medicaid eligible women who received care from primary physicians were compared to health department women.

The percentage of low birthweight infants was 8.3 for health department Medicaid women compared to 19.3 for Medicaid women seen in private physicians offices. Case management and coordination of services provided by the health department seem to be very beneficial for low income women. Women who received care from private physicians were much less likely to benefit from this coordination of health care services. The major differences in prenatal care seen for women utilizing the health department were patient education, home visitation, nutrition, assessment and counseling, and social service assessment and intervention (Buescher, Smith, Holliday, and Levine, 1987).

Nurse home visitation has also improved the social development of infants born into socially disadvantaged homes. Nurse-visited, poor, unmarried white women showed an 82 percent increase in the number of months they were employed, had 43 percent fewer subsequent pregnancies and postponed the birth of the second child. The value of a comprehensive nurse home visitation program may be questioned as being time consuming and costly. However the potential cost-savings due to increased maternal employment and reductions in unintended pregnancy are substantial (Olds, Henderson, Tatelbaum, and Chamberlin, 1988).

Few studies have examined interventions among Hispanic mothers. A prenatal health care coordination project for

Hispanic migrant farmworkers in North Carolina used public health oriented bilingual staff, maternal-child focused outreach services, lay migrant health advisors, and a multistate tracking system to improve quality of care. The project aimed to increase first trimester enrollment into prenatal care; improve continuity of care; and improve prenatal outcomes. First trimester entry into the system changed from 35 percent in 1985 to 51 percent in 1989. However, there was no improvement in the rate of LBW infants (Larson et al., 1992).

Summary

Prenatal care has become one intervention of choice for reducing the incidence of LBW infants, which currently account for two-thirds of all neonatal deaths (Merkatz et al., 1990; Illsey et al., 1984). Numerous risk factors have been shown to be associated with LBW infants. Prenatal care can prevent and alleviate many of these risk factors, especially if mothers receive care in the first trimester of pregnancy.

Hispanic women generally have fewer LBW infants for reasons yet to be determined, inspite of a history of inadequate or nonexistent prenatal care. Suboptimal prenatal care amongst Hispanics can be attributed to three main barriers: sociodemographic, personal, and system

barriers. Furthermore, few models of prenatal care have been evaluated with respect to these women. This lack of information leaves many unanswered questions regarding adequate prenatal care and prevention of neonatal mortality in this ethnic population.

The literature suggests various ways of removing prenatal care system barriers. Prenatal care needs to fit the needs of the community served, with appropriate community assessment performed periodically. This will minimize and/or remove personal, sociocultural, financial, and system barriers. Unless these changes are made to the current prenatal care system, inadequate prenatal care will continue to be this country's norm.

The prenatal care programs discussed in the literature did improve birth outcomes by improving prenatal care delivery. Prenatal care which included nutrition education; smoking, drug, and alcohol cessation; social support; and signs of pregnancy complications resulted in increased birthweights. Nurse home-visitation, counseling, and social service assessment and intervention also improved birth outcomes. However the minute amount of prenatal research published indicates a deficit of research and leaves many unanswered questions. Further, prenatal care research with Hispanic women is even rarer. There is much more to be learned about what constitutes adequate prenatal care for

this Hispanic population.

Conceptual Framework

The ROMPP individual conceptual model served as a base for our conceptual model (Appendix A) (Burton, 1994). Rural Hispanic women experience many of the predictor variables including barriers to care, shown in the ROMPP model. The barriers obstruct women from seeking adequate prenatal care. Inadequate prenatal care increases the risk of poor birth outcomes including low birthweight infants, preterm deliveries, and medical and obstetrical complications (longer hospital stays for infant and mother). Therefore, the ROMPP intervention attempted to increase prenatal care by barrier reduction, thus improving birth outcomes.

Research Questions

1. Does the use of an intensive outreach case management nursing model have a significant impact on birthweight for rural Hispanic infants?
2. Does the use of an intensive outreach case management nursing model have a significant impact on the gestational age for rural Hispanic infants?
3. Does the use of an intensive outreach case management nursing model have a significant impact on the length of hospital stay for rural Hispanic infants?

4. Does the use of an intensive outreach case management nursing model have a significant impact on the length of hospital stay for rural Hispanic mothers?

Chapter Three

Methods

Description of Rural Oregon Minority Prenatal Project

The Rural Oregon Minority Prenatal Project (ROMPP) was a five year nursing research and demonstration project conducted through the Oregon Health Division. ROMPP was funded by the National Center for Nursing Research, the Agency for Health Care Policy Research, and the Division of Nursing. The project was aimed at improving the birth outcomes of pregnant Native American and Hispanic women living in rural Oregon. These ethnic groups were selected as targets for prenatal outreach on the basis of poor pregnancy and birth outcomes, socioeconomic status, and diminished access to health care services, primarily resulting from rural, social, and cultural barriers to receiving adequate prenatal care.

The nursing case management and outreach model was implemented over three years. This model was grounded in three assumptions:

1. Interventions used with minority and culturally diverse clients should acknowledge and incorporate the beliefs, values, and health practices of those clients' native cultures;

2. Successful enrollment of high risk minority clients in health care services, particularly those residing in rural areas, rests upon the removal of barriers to receiving care. These barriers include cultural, language, geographic, social, transportation-related, financial, educational (lack of knowledge) and legal factors, as well as lack of trust between clients and providers; and

3. Use of community members native to the target population in an outreach role, in partnership with public health nurses, is the appropriate mechanism through which rural minority clients can be enrolled in early and continuous prenatal care.

To test these assumptions, ROMPP provided intensive outreach and nursing case management in communities, homes, and clinic settings for targeted women. All ROMPP services were delivered by public health nurse and outreach worker teams. The teams worked together with the objectives of identifying newly pregnant women at risk for poor pregnancy outcomes, enrolling them into clinical prenatal care, and providing case management services. Case management included screening and referral for pregnancy-related and other health and social problems, furnishing social and emotional support, as well as providing direct nursing care and coordinating follow-up. This model was consistent with

nursing case management and prenatal outreach models described in the literature (American Nurses Association, 1987; Institute of Medicine Committee to Study Outreach for Prenatal Care, 1988; Office of Technology Assessment, 1988).

Targeted women were enrolled in one of four intervention sites. Hispanic clients were served through the Klamath County Health Department in southern Oregon, and through the Malheur County Health Department in eastern Oregon. Native American clients are served through the Confederated Tribes of the Warm Springs Reservation in central Oregon, and through Klamath Tribal Health and Family Services in southern Oregon.

Model For Care

The nursing model implemented was an intensive outreach and nursing case management model. Public health nurses, as client advocates, were trained to identify clients at high risk for poor pregnancy outcomes, to recruit them into prenatal care, and to design appropriate individualized plans for their care. In partnership with an indigenous community outreach worker, the nurse monitored health status, provided education, and developed and improved linkages with needed social, health, and obstetric services.

The working relationship between nurse and outreach

worker varied based on client need, knowledge of the community, geography, language and cultural issues, and unique skills and talents of both providers. In general, the nurse coordinated all care and services. The outreach worker was directly accountable to the nurse for outreach services provided.

The ROMPP model was developed after a comprehensive review of the literature which indicated that home visits, outreach, social support and case management have been successful in improving maternity outcomes for high risk clients (Institute of Medicine Committee to Study Outreach for Prenatal Care, 1988; Office of Technology Assessment, 1988).

The basis for ROMPP nursing care was the Region X Prenatal Nursing Standards. The Standards were developed between 1985 and 1989 by public health nurses in the federal Region X (Department of Health and Human Services), through the University of Washington School of Nursing (Barnard, 1989). Marjory Gordon's eleven functional categories, which are the basis for nursing diagnosis, serve as the framework for the Standards. Each functional category included a goal statement, client outcomes, assessment specifics, and nursing diagnosis to be ruled out. The Standards included both screening instruments and actual protocols for public health nursing care of pregnant women.

The Region X Standards were used for screening and assessment, and to plan for care throughout pregnancy. Nurse and outreach worker teams followed clients in their homes, communities, and clinics through six weeks postpartum. The existing community referral system was used to secure comprehensive prenatal care, and to identify resources for non-maternity health and social problems (Kostelecky, Burton, & Carr, 1990).

The Standards served as the framework for all case management and the actual plan for outreach contact and health education. While actual structure of an individual's ROMPP care varied, every ROMPP client received a minimum of four face-to-face ROMPP prenatal visits, and one postpartum visit. ROMPP services were initiated prior to 20 weeks gestation. All ROMPP subjects received a t-shirt at their initial enrollment into the project, and a \$20 gift certificate at the conclusion of the postpartum visit (Burton & Curry, 1990).

Description of Setting and Participants

This section provides information about the ROMPP intervention at the Malheur county site which was used for sample selection for this study. First, a general overview of the demographics and geography of the study setting is provided. Next, demographic and prenatal care practices of

the population are described. Finally, information regarding the actual intervention and comparison groups selected for study are presented. This includes sample selection, protection of human subjects, and the procedure for matching sample characteristics for the study group (Burton, 1994).

Setting

Data for this study were collected at the Malheur County ROMPP site located in the southeastern part of Oregon, bordered by Idaho to the east and Nevada to the south. The average population per square mile is 1.4 (Oregon average: 29.3). Nearly 20% of the county population is Hispanic comprised of migrant and seasonal farmworkers and some year-round residents. Between 1989 and 1991, 65% of Hispanic mothers had fewer than 12 years of education, 20% were teens, and 36% were unwed. Approximately 26% received inadequate prenatal care, and 6% had LBW infants (Oregon Health Division, 1991; 1992a; 1993). Low income Hispanic women received prenatal care through Malheur Maternity Project, Valley Family Health Care, private obstetricians, and family practice physicians. All women delivered at the one hospital in Malheur county, Holy Rosary Medical Center.

Sample

The sample consisted of 102 ROMPP mothers and 132 matched control women. The ROMPP mothers completed the ROMPP intervention as described.

A comparison group was selected by matching ROMPP subjects with non-ROMPP mothers from the same site who delivered in the years preceding the intervention. Comparison group members were matched on age, race, income level, marital status, education (< or > 12 years), parity, U.S. citizenship, and country of origin. Matching was accomplished using birth certificates.

Protection of Human Subjects

The ROMPP project underwent Human Subjects Review in June of 1990. As a confidential, retrospective record review, this study qualified for exemption from human subjects review, under 45 CFR Section 46.101 (b) (4). Permission to review medical records for this study was obtained from Holy Rosary Medical Centers and Malheur Maternity Project.

Instruments

The data collection flowsheet recorded client ID number, birthweight in grams, gestational age in weeks, length of infant's hospital stay in hours, and length of

mother's hospital stay in hours. The data collection form is included in Appendix B.

Data Collection Procedure

Information from medical and prenatal records were collected retrospectively from ROMPP and non-ROMPP subjects.

All data collection took place confidentially in September and October, 1994. No names, social security numbers, or other patient identifiers were recorded. Participants were assigned a study identification number at the time of data collection. Data collection occurred at Holy Rosary Medical Center and Malheur Maternity Project in Ontario.

Data Analysis

Four variables were measured. Potential effects of the intervention were increased birthweight and gestational age, and decreased hospital length of stay for both infant and mother. These variables were operationalized in the following way:

Birthweight was recorded in grams as documented in the medical record.

Gestational age was recorded in weeks as documented in the medical record.

Infant's length of hospital stay was documented in hours. Hours were accrued from birth to discharge.

Mother's length of hospital stay was documented in hours. Hours were accrued from admission to discharge. The difference in mean birthweights, gestational age, infant's and mother's length of hospital stay between the intervention and the comparison group were analyzed by independent T-tests using the CRUNCH statistical package.

Chapter Four

Results

The purpose of this study was to determine whether a nursing case managed intervention impacted birth outcomes for rural Hispanic women. Four questions were asked to analyze the birth outcomes. T-test analysis was used for all four variables comparing intervention and control group means (Table 1). This analysis did not support the research questions.

First, did the use of an intensive outreach case management nursing model have a significant impact on birthweight for rural Hispanic infants? The difference in mean birthweight was not significant. Although, there were four ROMPP infants <2500 grams and nine control infants <2500 grams. This is clinically significant.

Second, did the use of an intensive outreach case management nursing model have a significant impact on the gestational age for rural Hispanic infants? The gestational age of the control group infants was one-half week longer (p value 0.04), which was statistically significant, but not clinically significant.

Third, did the use of an intensive outreach case management nursing model have a significant impact on the length of hospital stay for rural Hispanic infants? The

ROMPP infants' length of hospital stay was significantly shorter (p value 0.02).

Fourth, did the use of an intensive outreach case management nursing model have a significant impact on the length of hospital stay for rural Hispanic mothers? There was no statistical significance in the length of mothers' stay. However, there was a trend for ROMPP mothers' to have shorter stays.

Chapter Five

Discussion

Prenatal care interventions that have been previously assessed often fail to promote significant changes in outcome measures. Balcazar et al., (1991) and Larsen et al., (1992) found no significant difference in rate of Hispanic LBW infants post nursing case management intervention. An extensive literature review of Med-line and Cinahl, revealed no research studies looking at gestational age, mothers' length of hospital stay, and infants' length of hospital stay, but did identify multiple barriers to prenatal care that could potentially affect birth outcomes. Barriers included financial, sociodemographic, system, and personal (Curry, 1990, Balcazar et al., 1991, Poland et al., 1987, Scupholme et al., 1991, Leatherman et al., 1990, and Young et al., 1989). The ROMPP case managed intervention of this study addressed sociodemographic, system, and personal barriers on birthweight, gestational age, mother\infant length of hospital stay.

While differences in birthweight initially appeared significant with fewer numbers of LBW infants (<2500 grams) in the intervention group (four), as compared to the control group (nine), t-test analysis indicated no statistically significant difference between these two groups. Further

analysis using chi-square confirmed this was not statistically significant. However, five fewer LBW infants in the ROMPP group is clinically significant!

There was a statistically significant difference in gestational age. However, it was not clinically significant. The intervention group's mean gestational age was 38.95 weeks and the control group's was 39.42 weeks. The difference was about one-half week. Clinically, one-half week does not impact infant birth outcomes. There were two sets of twins in the study. The ROMPP twins were carried to 39 weeks gestation, while the control twins were only carried to 32 weeks. However, no correlation between these two groups can be made due to the small sample size.

Length of infants' hospital stay was statistically significant; control infants' had longer stays. However, mothers' length of stay was not. The reliability of the length of stay results are questionable. Hospital lengths of stay have historically declined. The women delivered at two different time periods, the control group births were from 1988 to 1991 and the intervention births occurred from 1992 to 1994. Care providers' practices and insurance reimbursement policies may have influenced this decline in length of stays. The biggest year-to-year length of stay difference was from 1990 to 1991, during the control group time period. (Table 2) The ROMPP project didn't begin until

1992, raising further suspicion of a change in policy rather than the intervention's influence.

Summary and Implications

The Rural Oregon Minority Prenatal Project (ROMPP) was a culturally appropriate nursing case managed and outreach model developed to improve birth outcomes for Hispanic women. Ideally, the program should facilitate the removal of sociodemographic, personal, and system barriers to seeking prenatal care that Hispanic women face. In doing so the researchers hoped to find that a culturally appropriate intervention to a homogeneous Hispanic population would make a difference in birth outcomes. Birth outcomes of increased birthweight and gestational age, and reduced length of infants' and mothers' hospital stay were the intended goals. The ROMPP study compared two homogeneous Hispanic groups by birthweight, gestational age, and length of mothers' and infants' hospital stay. This will begin to address the lack of research regarding prenatal health care needs of Hispanic women.

The ROMPP model is defined as an outreach and nursing case managed model. Public Health nurses, as client advocates, were trained to identify clients at high risk for poor pregnancy outcomes, to recruit them into prenatal care, and to design appropriate individualized plans for their care. In partnership with an indigenous community outreach worker, the nurse monitored health status, provided education, and developed and improved linkages with needed

social, health, and obstetrical services in a culturally appropriate manner.

The sample consisted of 102 ROMPP and 132 control women who gave birth between the years 1988 and 1994. All the women resided in Malheur County in Eastern Oregon and delivered at Holy Rosary Medical Center.

Retrospective data collection included birthweight in grams, gestational age in weeks, and length of infants' and mothers' hospital stay in hours. The data was obtained from the medical records of the mothers and infants.

The four research questions were analyzed by t-tests. There were no statistically significant differences between the infants' birthweights or mothers' length of hospital stay. However, control women had twice as many LBW infants, that while not statistically significant is clinically significant. The gestational age of the control infants' was significantly older ($p < 0.04$) by a half a week. However, this is not clinically significant. ROMPP infants' hospital stay was significantly shorter ($p < 0.02$) than control infants which may have been a result of fewer LBW infants' in this group. However, this may also have been impacted by the change in care provider practices and insurance reimbursement policies over time. The control group sample came from women who delivered in the years 1988 to 1991 and the ROMPP intervention occurred during 1992 to

1994. The greatest decline in hospital stay occurred between 1990 and 1991, during the control group period.

This retrospective study had five apparent limitations. First, the shortening of standard lengths of stay that occurred nationwide probably influenced infant's and mother's length of hospital stay. The control group was selected by birth certificates from 1988 to 1991, while the intervention occurred from 1992 to 1994. With this in mind one would have anticipated a shorter length of stay in the intervention group even in the absence of a significant effect.

Second, a convenience sample of women living in Malheur County provided the data base. Although this population had many similar characteristics, one cannot assume the two comparison groups began pregnancy with the same risks. Third, the sample size was small, 102 intervention and 132 control mother-infant pairs. There were nine LBW infants' in the control group and four in the ROMPP group.

Fourth, physicians provided care for the control group while the intervention group received most of their care by certified nurse midwives. The focus of prenatal care may be different between physicians and certified nurse midwives.

Last, patients who entered the ROMPP intervention did so by choice. Those with the most prenatal care barriers

may not have felt free to participate. The fear of immigration reprisal, cultural ideologies, and general mistrust of the health care system may have interfered with participation in the program.

The Hispanic culture, unlike other ethnic groups, has relatively infrequent low birthweight infants even though inadequate prenatal care is often received. Further prospective randomized studies are needed to explain this and answer other questions that arose in this research project. First, why do Hispanic women deliver appropriate size infants with limited prenatal care? Second, how often do Hispanic women need to be seen during pregnancy to have favorable birth outcomes? Third, what prenatal programs will be utilized by Hispanic women, including WIC and other social services? Fourth, what needs to be included in the prenatal visits that is culturally appropriate for these women?

This study proposed that when two Hispanic groups are compared, a ROMPP case managed group and a control group, the intervention group would have increased birthweight, and gestational age; and decreased maternal and infant complications measured in hospital stay hours following delivery. The results indicated a statistical difference in gestational age with longer gestations for control infants'. However, there was a statistically significant decrease in

ROMPP infants' length of stay. Although, birthweight was not statistically significant, there were five fewer LBW infants in the ROMPP group which is clinically significant. In light of these results, the benefits of culturally appropriate prenatal care and the need to reduce LBW infants warrants further investigation into Hispanic prenatal care.

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Table 1**Birthweight in Grams**

| | Number | Mean | S.D. | P Value | Low Range | High Range |
|------------|--------|----------|---------|---------|-----------|------------|
| ROMPP | 102 | 337.647 | 460.290 | | 2233 | 4616 |
| Control | 132 | 3295.409 | 564.970 | | 1388 | 5153 |
| Difference | | 42.238 | | 0.52 | | |

Gestational Age in Weeks

| | Number | Mean | S.D. | P Value | Low Range | High Range |
|------------|--------|--------|-------|---------|-----------|------------|
| ROMPP | 102 | 38.951 | 1.531 | | 32 | 42 |
| Control | 132 | 39.424 | 1.977 | | 30 | 43 |
| Difference | | -0.473 | | 0.04 | | |

Length of Infants' Hospital Stay in Hours

| | Number | Mean | S.D. | P Value | Low Range | High Range |
|------------|------------------|---------|--------|---------|-----------|------------|
| ROMPP | 101 ¹ | 35.446 | 47.538 | | 6 | 364 |
| Control | 132 | 57.098 | 94.129 | | 8 | 792 |
| Difference | | -21.653 | | 0.02 | | |

Length of Mothers' Hospital Stay in Hours

| | Number | Mean | S.D. | P Value | Low Range | High Range |
|------------|--------|--------|--------|---------|-----------|------------|
| ROMPP | 102 | 40.598 | 39.633 | | 11 | 290 |
| Control | 132 | 50.348 | 37.537 | | 9 | 252 |
| Difference | | -9.750 | | 0.057 | | |

¹There was one fetal demise in the ROMPP group at 37 weeks gestation. The gestation age and the birthweight were recorded.

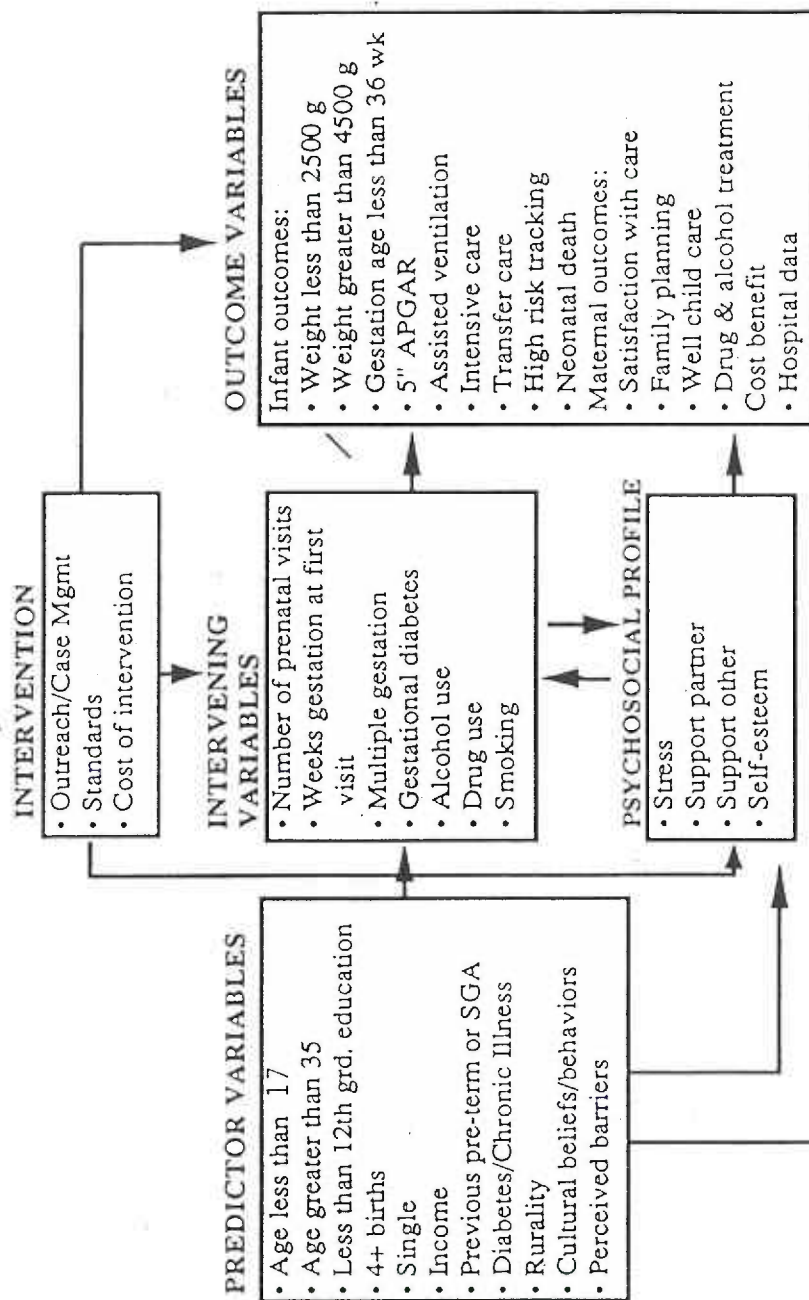
Table 2**Control Group**

| Infants' Hospital Stay | | | | Mothers' Hospital Stay | | |
|-------------------------------|--------|------|-------|-------------------------------|-------|------|
| Year | Number | Mean | S.D. | Number | Mean | S.D. |
| 1988 | 22 | 55.6 | 46.0 | 22 | 61.5 | 49.6 |
| 1989 | 25 | 56.9 | 52.7 | 25 | 50.6 | 27.9 |
| 1990 | 40 | 68.4 | 108.2 | 40 | 57.0 | 44.2 |
| 1991 | 45 | 47.9 | 115.2 | 45 | 38.8 | 25.1 |
| Total/Mean | 132 | 57.2 | | 132 | 51.98 | |

ROMPP Group

| Infants' Hospital Stay | | | | Mothers' Hospital Stay | | |
|-------------------------------|--------|------|------|-------------------------------|------|------|
| Year | Number | Mean | S.D. | Number | Mean | S.D. |
| 1992 | 9 | 44.3 | 56.1 | 9 | 37.8 | 23.0 |
| 1993 | 50 | 35.9 | 58.2 | 51 | 39.1 | 37.1 |
| 1994 | 42 | 33.1 | 28.8 | 42 | 43.0 | 45.6 |
| Total/Mean | 101 | 37.8 | | 102 | 40 | |

ROMPP CONCEPTUAL MODEL INDIVIDUAL MODEL



Appendix B

Data Collection Flowsheet

| | | | | | |
|---|--|--|--|--|--|
| Client ID number (ROMPP or comparison) | | | | | |
| Birthweight (Grams) | | | | | |
| Gestational age (Weeks) | | | | | |
| Length of infant's hospital stay (Hours) | | | | | |
| Length of mother's hospital stay (Hours) | | | | | |
| Client ID number (ROMPP or comparison) | | | | | |
| Birthweight (Grams) | | | | | |
| Gestational age (Weeks) | | | | | |
| Length of infant's hospital stay (Hours) | | | | | |
| Length of mother's hospital stay (Hours) | | | | | |

Data Collection flowsheet developed by Norris, J. and Riger, C. 1994.