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RELATIONSHIP BETWEEN RACE, ADEQUACY OF PRENATAL CARE, AND BIRTHWEIGHT IN LOW SOCIOECONOMIC WOMEN

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By

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ABSTRACT

RELATIONSHIP BETWEEN RACE, ADEQUACY OF PRENATAL CARE, AND BIRTHWEIGHT IN LOW SOCIOECONOMIC WOMEN

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This study was a secondary analysis of data to investigate differences in birthweight and adequacy of prenatal care between 321 low socioeconomic African-American and Caucasian women who received services at the same comprehensive prenatal care center. Adequacy of prenatal care was determined using a modified version of the GINDEX. Birth weight increased significantly as adequacy of prenatal care increased for the entire sample. No statistical differences were noted in the adequacy of care patterns or in birthweights between the racial groups. There was a weak non-significant interaction between race, adequacy of prenatal care, and birthweight. These findings confirm the commonly held assumption that adequacy of prenatal care does affect birth weight. Implications include the need for cultural sensitivity, individual holistic assessment, and cooperative planning with the client. Targeted services and special interventions for African-American women may be necessary to improve the utilization of prenatal care services.

DEDICATION

To my very special parents Lee and Jean, great in-laws Cathie and Gene, wonderful daughters Christi and Katie, and most of all my beloved husband Ed, who daily continue to teach me the power of the words, "Love, the perfect bond of unity" (Colossians 3:14).

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Introduction

In the last two decades our nation's progress in combating low birthweight (LBW) has slowed (Hogue & Yip, 1989; Stoto & Durch, 1991). The U.S. Surgeon General's 1990 Health Objective Goal (Institute of Medicine [IOM], 1985) of decreasing LBW to not exceed nine percent for all U.S. counties and ethnic groups went unmet. Statistically, African-American women continue to deliver a larger percentage of LBW babies and subsequent infant mortality than Caucasian women (U.S. Department of Health and Human Service [DHHS], 1990). In 1988, the LBW rate for Caucasians was 5.6 % while the African-American LBW was 13.0% (Rosenbaum, Layton, & Liu, 1991). In the same year the rate of African-American infant mortality was 17.6%, compared to 8.5% for Caucasian infants (Rosenbaum et al., 1991). Low birthweight in 1988 was almost twice as common in African-American infants as it was in Caucasians (DHHS, 1990). Inadequate prenatal care was documented for 15.5% of African-American women compared to 6.1% Caucasian women (Rosenbaum et al., 1991). In 38.9% of African-American live births in 1987, the mothers did not participate in first trimester prenatal care (DHHS, 1990).

The disparity in infant mortality, LBW, and prenatal care between African-American and Caucasian women continues to be a source of concern (Keinman & Kessel, 1987; Murray & Bernfield, 1988; Poland, Ager, & Olson, 1987; U. S. Department of Health and Human Services [DHHS], 1989). With each decade, the demographic fabric of the United States changes, resulting in a nation that is continually becoming more ethnically diversified. With the percentage of African-American population increasing (U.S. Bureau of Census, 1990), it becomes imperative that researchers delve deeper into the possible differences between African-American and Caucasian women in prenatal care and birthweight patterns to help improve the birth outcomes of all infants. A number of studies have been conducted on the rate of LBW (Collins & David, 1990; Kugler, Connell, & Henley, 1990; Lee, Ferguson, Corpuz, & Gartner, 1988) as well as prenatal care usage, especially related to limited or reduced prenatal care (Hulsey, Patrick, Alexander, & Ebeling 1991; Ingram, Makuc, & Kleinman, 1986; Petitti, Coleman, Binsacca, & Allen, 1990; Sable, Stockbauer, Schram, & Land, 1990). Many of these studies also have been conducted in higher risk, low socioeconomic women (Broekhuizen, Utrie, & Van Mullem, 1991; Gould & Leroy, 1988). Relationships between prenatal care and birthweight, particularly LBW have also been investigated (Moore, Aigel, Key, Renick, 1986; Ryan, Sweeney, & Solola, 1980). Less research has been conducted on the "normal" populations, ie.

those without complications, or those with normal birthweight babies (Hulsey et al., 1991; Schoendorf, Hogue, Kleinman, & Rawley, 1992). Few studies have looked at these normal birthweight populations in terms of the differences that might be identified within and between African-American and Caucasian women.

Based on clinical observations noted within a community as well as the literature, differences between African-American and Caucasian women with respect to prenatal care and birthweight appear to be a result of race as well as the effects of socioeconomic status, age, education, and marital status (Collins & David, 1990; Gould & Leroy, 1988; Greenberg, 1983; Kleinman & Kessel, 1987; Poland, Ager, Olson, & Sokol, 1990). Further research is needed to identify specific effects of race and prenatal care patterns that impact birthweight. Investigating the differences between African-American and Caucasian women should provide greater insight into the prenatal care needs of those women and assist providers of care to help women receive the full benefit of needed prenatal care services.

The purpose of this study was to conduct a secondary analysis of data to investigate differences in birthweight and adequacy of prenatal care between low socioeconomic African-American and Caucasian women who received services at the same comprehensive prenatal care center. The research questions were:

1) Are there differences in the adequacy of care patterns between African-American and Caucasian women?

2) Are there differences in birthweight for different adequacy levels of prenatal care?

3) Are there differences in birthweight between African-American and Caucasian neonates?

4) Is there an interaction between race and adequacy of prenatal care with respect to birthweight?

It is critical that possible differences in the area of prenatal care and birthweight in African-American and Caucasian populations are investigated to better direct our future planning and care delivery systems to reflect the needs of a growing minority population. Research on this question will expand the body of knowledge and hopefully identify further research needs and advanced nursing practice interventions.

Conceptual Framework

The conceptual framework developed by King (1981) is characterized by the concept of the process of human interaction. The subconcepts within the process of human interaction will provide a model to explain the relationship of the variables of the study: race, adequacy of prenatal care, and birthweight. The model will be defined in three levels: conceptual, theoretical, and operational. (See Figure 1)

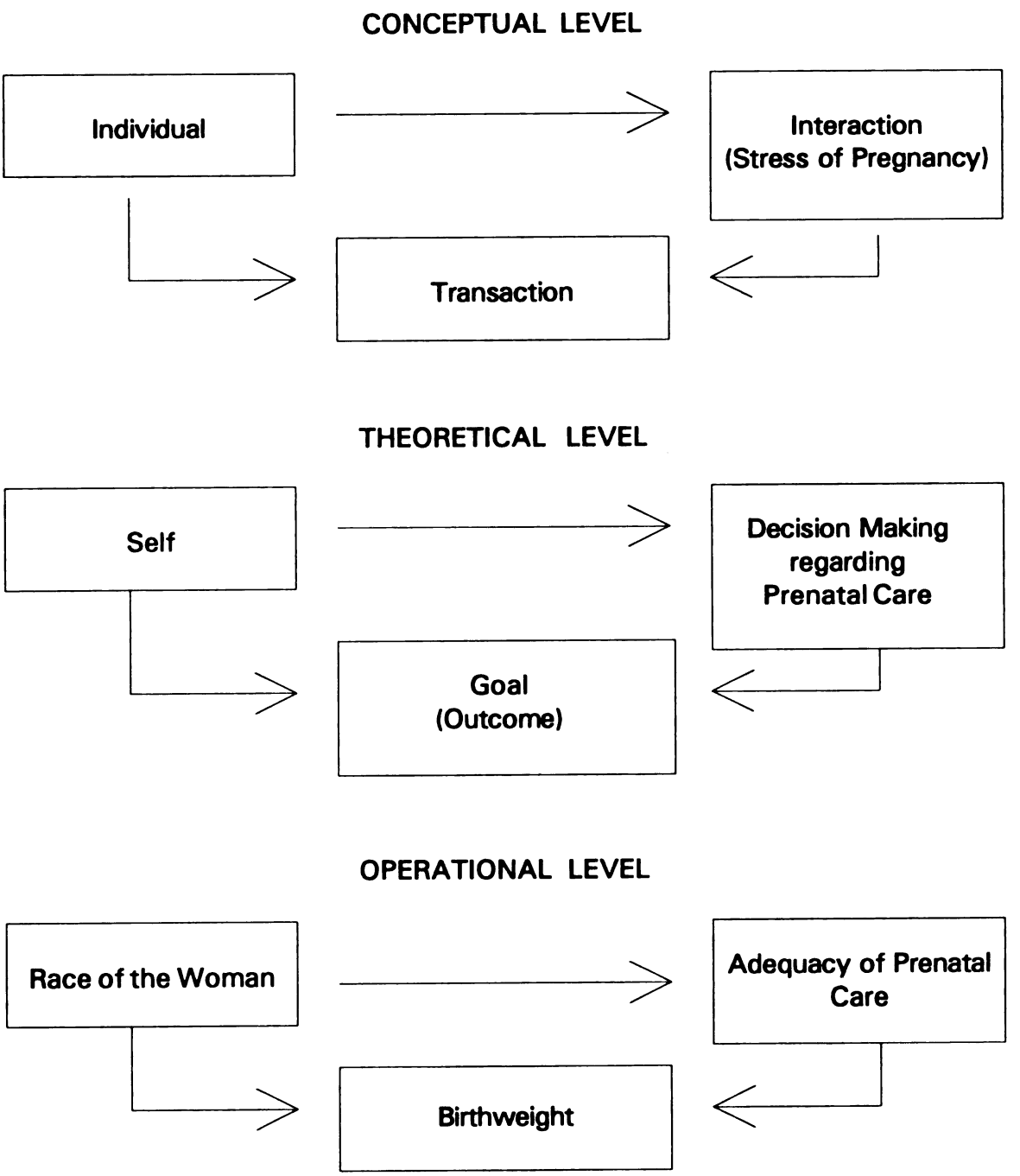

Figure 1. Conceptual Framework for the Study of Relationship of Race, Adequacy of Prenatal Care, and Birthweight.

Conceptual Level

The individual within the conceptual framework can also be described as a total human being. Conceptually, perception, growth and development, body image, time and space are part of the individual as well as his/her perception of self which influences the way he/she responds to others and events (King, 1981). As a part of a dynamic state, human beings interact with the environment to maintain balance for growth, development, and performance, which involves exchange of energy and information between the person and the environment for the regulation and control of stress (King, 1981).

Stress is a concept essential to understanding the interaction process (King, 1981). Stress is everywhere and is an essential component of life. The level of stress one experiences constantly changes. Pregnancy has been identified as stress. As a life change, pregnancy affects the woman not only physiologically, but psychologically and socially as well.

Transactions are a process of interaction. King states, "Transactions are valued by the individual because the goal is meaningful and worth achievement" (King, 1981, p. 82). According to King, when transactions occur, stress is decreased in a situation.

Theoretical Level

Self is defined as a dynamic individual, an open system which is both unified and complex. Within the study, self

is identified as the woman receiving prenatal care. "Each person is unique in genetic inheritance, in experiences, and in perceptions of the external world" (King, 1981 p.27). A person's self is also described as the sum total of all one can call his or hers. "Each self is a whole person who grows and develops in a specific society ... is reflected in patterns of growth and development and in the structure and function of human beings" (King, 1981 p.28).

The stress of pregnancy influences the process of human interaction as well as the decision-making in accessing prenatal care services. Decision-making is a personal, individual process. It is a critical component in making judgments, choosing, and acting upon those choices of when and how often prenatal care is received and determining the adequacy of prenatal care. It is a continuous and ongoing process throughout the pregnancy. The stress of pregnancy can be perceived as both positive and negative, and the pregnant woman responds based on her unique perceptions and interpretations of the pregnancy. Decision-making in prenatal care is seen as a series of events in time used to achieve a transaction or goal (Sieloff-Evans, 1991).

Goals or outcomes are the result of transaction that occur as a consequence of an individual's decision-making and taking some action on those decisions (King, 1981). The decision to receive prenatal care and attend prenatal visits may influence birth outcomes.

Operational Level

Race of the mother, as one of the study variables, can be operationalized within the definition of self. Race is an integral part of self, part of not only the genetic inheritance that is unique, but of perceptions and experiences as well. Race will have an impact on the interactions that occur.

The decision-making process of the pregnant woman impacts the adequacy of prenatal care. Adequacy of prenatal is the operationalization of interaction. It may influence the birth outcome and therefore birthweight. Birthweight is one component of birth outcome, in which the pregnant woman with her health care provider communicate to achieve goals that are valued.

Birthweight is influenced by a number of factors, which may include race of the mother and adequacy of prenatal care (DHHS, 1989; Shino, Klebanoff, Graubond, Buendes, & Rhoads, 1986; Wilcox & Russell, 1990). In this study the concept of birthweight is not being described as positive (normal birthweight) or negative (low birthweight). The purpose, however, is to describe the differences in birthweight that may be noted between adequacy of prenatal care groups and race.

Using King's concept as a framework for the study problem, the race of an individual woman (African-American or Caucasian), who is experiencing the stress of pregnancy, influences decisions regarding her participation in prenatal

care, described in terms of adequacy of prenatal care. Race and adequacy of prenatal care will influence birthweight of the infant, conceptualized as transaction.

Conceptual Definition of the Variables

Adequacy of prenatal care

Prenatal care has been identified as early as the turn of the century as having a positive impact on birth outcomes (Merkatz & Thompson, 1990). Prenatal care has been described both qualitatively and quantitatively (Greenberg, 1983; Hansell, 1990). The majority of studies have described prenatal care from a quantitative standpoint, focusing primarily on the timing of the first visit and the frequency of scheduled visits throughout the duration of the pregnancy (Alexander & Cornely, 1987). While it is true that this is not a measure of quality, as McDonald and Corbin (1988) indicated, and quality is not specifically addressed, it does imply that quantity is a necessary condition for quality of care to occur. That is, that the woman has to begin care early and continue care frequently in order to be exposed to the qualitative aspect or content of care.

Kessner and his colleagues (Kessner, Sinder, Kalk, & Schlesinger, 1973) developed an index for measuring adequacy of prenatal care patterns. The index focused on timing and frequency of prenatal care and adjusted for gestational age at delivery. The three factors considered in determining level of adequacy of prenatal care were: a) trimester

prenatal care began; b) the number of prenatal care visits meeting American College of Obstetrics and Gynecology (ACOG) guidelines set at that time and that have since been updated (ACOG, 1989); and c) gestational age which is utilized to adjust for early births.

Adequate care is identified as care initiated in the first trimester and following the recommended (ACOG, 1989) number of visits for gestational age. Inadequate care is defined as care initiated in the second or third trimester and less than one-half the visits that would be received in the adequate care group. Intermediate prenatal care is defined as all other categories of visits (Kessner et al., 1973).

The Kessner index continues to be utilized as a research measurement tool and follows current Standards for Obstetric-Gynecologic Services (ACOG, 1989) as well. Alexander and Cornely (1987) altered the index to accommodate women who make more than the expected number of visits in a normal pregnancy. These extra visits are viewed conceptually by Alexander and Cornely (1987) as indicators of morbidity or complications. (See Alexander and Cornely, 1987 for complete delineation of the categories).

The Public Health Service (1989) Expert Panel on the Content of Prenatal Care defined prenatal care qualititatively, as the following:

> "Prenatal Care consists of health promotion, risk assessment, and intervention linked to the risks and conditions uncovered. These activities require the cooperative and coordinated efforts of the woman, her family, her prenatal care providers, and other specialized providers. Prenatal care begins when conception is first considered and continues until labor begins. The objectives of prenatal care for the mother, infant, and family relate to outcomes through the first year following birth. " (p. 10)

For the purpose of this study, adequacy of prenatal care is defined quantitatively according to Alexander and Cornely (1987) by three factors: 1) when prenatal care was first initiated; 2) total number of prenatal care visits; and 3) gestational age of infant at delivery to adjust for premature birth (which would reduce the optimal number of visits being delivered).

These patterns will be divided into four groups: intensive, adequate, intermediate, and inadequate as defined by Alexander and Cornely (1987). Four patterns of care will be defined.

Adequate prenatal care. Adequate prenatal care will be defined as the client initiating care in the first trimester and following the recommended schedule for prenatal care visits for gestational age.

Intermediate prenatal care. Intermediate prenatal care is identified as care initiated in the first or second

trimester and having approximately half the visits that are considered to be adequate when adjusted for gestational age.

Inadequate prenatal care. Inadequate prenatal care is defined as very limited visits for gestational age and/or late entry into care.

Intensive prenatal care. Intensive prenatal care refers to a higher number of prenatal visits than would normally be required throughout the pregnancy regardless of time of entry to care and would indicate an increased need for services either for a physical or psychosocial risk factor (Alexander & Cornely, 1987; DHHS, 1989).

The categorization of adequacy of prenatal care will allow observations to be made on the patterns within each racial group studied and to compare the groups.

Race

The second concept is race. The impact that racial background and ethnicity may play on prenatal care practices and birthweight continues to be deliberated (Dowling & Fisher, 1987). Shiono, Klebanoff, Graubard, Berendes, and Rhoads (1986) found large differences in birthweight between Caucasian, African-American, Hispanic, and Asian infants. Differences among foreign-born and U.S. born women in birth outcomes have also been demonstrated (Cabral, Fried, Levenson, Amaro, & Zuckerman, 1990).

Race has been described as adding to the diversity of our world as well as giving variation to the population. Race may be defined simply as a group of people with a set

of complex hereditary factors (Montague, 1964), or as "a group of mankind, members of which can be identified by the possession of distinctive physical characteristics" (Brace, 1964, p. 145). Some authors describe race from a framework of a breeding population (Goldsby, 1971). For this study, race of the mother will be defined as a geographically and culturally determined collection of individuals who share a common gene pool and are similar in many characteristics and identify themselves as part of that group (Molnar, 1983).

Birthweight

Birthweight is frequently used as an outcome variable to measure the effectiveness of prenatal care (Scholl, Miller, Salmon, Cofsky & Shearer, 1987) with LBW identified as a major determinant of the overall neonatal mortality. LBW was categorized by Yippo as early as 1919 (Merkatz & Thompson, 1990) as those infants weighing less than 2500 grams. While little statistical evidence was used to determine that arbitrary cut-off for birthweight, it has remained the standard over the last 80 years for both male and females and for all races and ethnic groups.

Generally birthweight is classified as: 1) normal- 2500 grams or greater; 2) low birthweight- less than 2500 grams; and 3) very low birthweight- less than 1500 grams (Collins & David, 1990; Hulsey et al., 1991,; Joyce, 1990; Kleinman & Kessel, 1987; McCormick, 1985; Peoples & Seigel 1983). Wilcox and Russell (1990), as well as others have questioned the use of maintaining one single standard of birthweight

for all babies, regardless or race or sex. Birthweight for the purpose of this study is defined as a continuum of weight in grams of the infant at birth.

Review of Literature

Adequacy of Prenatal Care

Prenatal care initiated within the first trimester and continuing throughout the pregnancy has been associated with reducing LBW, especially for women at highest risk (DHHS, 1989; Hulsey et al., 1991; IOM, 1985; Peoples & Seigel, 1983; Scholl et al., 1987; Showstack, Budetti, & Minkler, 1984). Low socioeconomic status, irrespective of race, has been identified as a variable linked to lower levels of prenatal care (Poland et al., 1987). Research has also identified African-American women as often starting prenatal care later and having fewer prenatal care visits than Caucasian women (Burks, 1992; Greenberg, 1983; Ingram et al., 1986; Petitti et al., 1990; Sable et al., 1990).

Alexander and Cornely (1987), found increased utilization of prenatal care was associated with higher mean birthweight and gestational age. In reporting demographic information, however, they did not report the data by race.

Race and Birthweight

Demographic factors including race, age, economic status, education, and marital status are all frequently identified as possible risk factors for increased incidence of LBW (Greenberg, 1983; Ketterlinus, Henderson, & Lamb, 1990; Kleinman & Kessel, 1978; Moore et al., 1986). Wilcox

and Russell (1990) indicate in their research that African-American infants consistently have mean birthweights approximately 250 grams less than Caucasian infants throughout the range of birthweight and gestational age. In one study of mothers without pregnancy complications, the average birthweight of an African-American baby was 181 grams less than Caucasian babies (Hulsey, Levkoff, & Alexander, 1990). In multi-ethnic studies, large differences in birthweight have been noted between ethnic groups. These differences persist even after controlling for demographic differences as well as medical risk factors (Shiono et al., 1986). The relative mean difference in birthweight for Asians was 210 grams less, for African-Americans 246 grams less and Hispanics 105 grams less than Caucasian babies.

The question of the etiology of these differences in birthweight and the possible inherent biological differences that may influence birthweight has also been considered (Kleinman & Kessel, 1987). Low birthweight and very low birthweight rates in the same study group were found to be higher in African-American infants than Caucasian infants even for college educated parents (Schoendorf et al., 1992). Interestingly, even though the overall rate for infant mortality for African-American babies is higher, some studies have found African-American infants weighing less than 2500 grams to have lower mortality rates than Caucasian infants of the same weight. At weights greater than 3,000

grams, African-American infants have higher mortality rates than Caucasians (Binkin, Williams, Hogue, & Chen, 1985; Wilcox & Russell, 1990).

However, African-American infants born to college educated parents were not found to exhibit a higher mortality rate at a weight greater than 2500 grams (Schoendorf et al., 1992). Comparison of African-American and Mexican American women of low socioeconomic status in Chicago showed startling differences in the LBW ratio with 16.6% of the African-American women delivering babies with LBW compared to 5.9% for Mexican-American women (Dowling &Fisher, 1987).

Adequacy of Prenatal Care, Race, and Birthweight

Murray and Bernfield (1988) determined that adequate prenatal care levels positively improved birthweight, very low birthweight, and term gestation. This had a greater impact on African-American women than Caucasian women. The percentage of LBW is found to be the lowest in adult Caucasian women who have adequate prenatal care (Gould & Leroy, 1988). Several studies indicate that even African-American women of middle class income and those with prenatal care available (such as enrollees in an HMO), delay the start of prenatal care and have a higher incidence of lower birthweight babies (Collins & David, 1990; Lieberman, Ryan, Monson, & Schoebaum, 1987; Murray & Bernfield, 1988).

Higher education has a stronger relationship in increasing prenatal care usage and increased birthweight

(Kugler et al., 1990) than other demographic variables, although Schoendorf, Hogue, Kleinman, and Rawley (1992) found in their study on college educated parents that the African-American infant mortality was still almost twice as high as Caucasian women. However, the rates were lower than the general African-American population.

Critique of the Literature

The majority of prenatal care, LBW, and infant mortality research is compiled using vital statistics data. While the use of this data makes large samples available and fairly easy to access, it does have limitations. The researchers are limited in the variables available, the reliability and consistency of the data, as well as a large amount of missing data (Alexander, Tompkins, Peterson, & Weiss, 1991).

Current literature, although identifying African-American infants at higher risk for infant mortality and LBW, as well as smaller mean birthweights, seems to remain uncertain and/or reluctant to identify the basis for these differences. Suggested explanations include the effect of cultural, socioeconomic or biological differences (Kliegman, Rottman, & Behrman, 1990; Wilcox & Russell, 1990). Certainly this area needs continued research.

The goals of prenatal care should be to identify components or combinations of prenatal services that are effective in preventing various poor pregnancy outcomes in well defined groups of women (McLaughlin, Altemeier,

Christensen, Sherrod, Dietrich, & Stern, 1992; Moore et al., 1986). There are several studies indicating improved outcomes to high risk women (both African-American and Caucasian) when prenatal care was delivered through a comprehensive care center versus a private physician (Handler & Rosenberg, 1992; Leppert, Namerow, & Barker, 1986; McLaughlin et al. 1986).

Literature seems to be limited in describing different patterns of prenatal care other than those identified by Kessner's (1973) Index (Melnikow, Alemagno, Rottman, & Zyzanski, 1991). Although Alexander and Cornely (1987) developed an alternative expanded method to measure patterns of prenatal care, it has had little use. Knowledge of the impact of increased visit patterns over the recommended and accepted standards currently used may well be useful in evaluating the need for changes in service delivery (DHHS, 1989). Comparison of these patterns between African-American and Caucasian women may also be useful in evaluating prenatal care needs for women.

As indicated in the literature review, the studies exploring the relationships between prenatal care and race for LBW infants are plentiful. There is little, however, to indicate the effects of the relationships of prenatal care, race, and normal birthweight infants. Further research related to race and its effect on birthweight (IOM, 1985), is needed to provide a sound rationale for modifying current methods of delivering prenatal care services.

Methods

Design

Secondary analysis of the data was employed in this research study. The current study was conducted as an ex post facto, descriptive, correlational design where the intent of the investigator was to explore relationships between the variables under discussion. The primary data were generated from a quantitative evaluation study of comprehensive prenatal services conducted through retrospective chart review.

Sample

The sample consisted of 321 African-American and Caucasian women, with singleton deliveries receiving care at one comprehensive prenatal care center who were not referred to other physicians for specialized ongoing prenatal care management and/or delivery. Only those cases identified with Medicaid insurance reimbursement (pregnant women with maximum income of 150% of poverty) were included to ensure low income status. Cases where infant birthweight and gestational age at birth were missing were excluded from this sample.

The primary initial data set was obtained from a retrospective chart review of 412 cases of women delivering between February and September, 1990 at a not-for-profit comprehensive prenatal care center in a mid-size midwestern city. The total sample for the primary study consisted of 116 African-American women and 273 Caucasian women. The

data set included women provided with prenatal care services of at least one prenatal visit over a nine month period and resulted in the delivery of 406 singleton births and 6 sets of twins. Medicaid was the reimburser for 89.4% of the women in the total sample. Basic demographic data for each client, as well as service utilization data and birthweight were also contained within the data set.

The data provided the researcher with a sample of African-American and Caucasian pregnant women who had equal availability within the community for prenatal care services. The center served primarily low income women and provided a comprehensive range of services to clients. Prenatal care, childbirth education, and counseling were provided by a staff of certified nurse midwives, physicians, medical social workers, dieticians, and nurses.

Operational Definitions

The variables of interest to the study include adequacy of prenatal care and race as independent variables, and birthweight as the dependent variable. These variables have been defined conceptually from the literature and specifically for this study. The operational definitions of the concepts are as follows:

Prenatal care. Prenatal care visits were defined as regularly scheduled visits for routine assessment by either a certified nurse-midwife or a physician as recorded in the patient record.

Trimester Prenatal Care Began. Trimester prenatal care began is based on the week of gestation the pregnant woman first obtained services for the current pregnancy and as recorded on the initial record based on the date of the Last Menstrual Period. Prenatal visits initiated by week thirteen were considered first trimester visits. Second trimester was considered weeks 14 through 27. Care initiated after the 28th week were considered third trimester care.

Gestational age at Delivery. Gestational age at delivery was defined as the number of completed weeks of pregnancy, calculated from the first day of the last menstrual period as recorded on the labor and delivery record immediately after birth and found in the patient record.

Adequacy of Prenatal Care. Four classifications of prenatal care (based on the GINDEX model, see Alexander and Cornely, 1987) were used to describe adequacy of care. (Refer to Table 1 for specific category combinations). Categories take into account the trimester prenatal care began, number of prenatal care visits, and gestation at delivery.

Intensive prenatal care began during the first, second, or third trimester and includes a minimum of seven visits (for the shortest gestational period), with a woman generally receiving more prenatal care visits then would be the ordinary standard during pregnancy.

Table 1

Adapted GINDEX: Criteria for Adequacy of Prenatal Care

Trimester Care Began	Weeks of Gestation at Delivery	Adequacy of Prenatal Care Patterns			
		Intensive Care	Adequate Care	Intermediate Care	Inadequate Care
		(By Number of Prenatal Care Visits)			
First	13 or less	> 7	1 - 6		
	14 to 17	> 9	2 - 8	1	
	18 to 21	> 11	3 - 10	1 - 2	
	22 to 25	> 13	4 - 12	2 - 3	1
	26 to 29	> 14	5 - 13	2 - 4	1
	30 to 31	> 15	6 - 14	3 - 5	1 - 2
	32 to 33	> 16	7 - 15	4 - 6	1 - 3
	34 to 35	> 16	8 - 15	5 - 7	1 - 4
	36 to 42	> 16	9 - 15	5 - 8	1 - 4
Second	11 to 13	> 7		1 - 6	
	14 to 17	> 9		1 - 8	
	18 to 21	> 10		1 - 9	
	22 to 25	> 11		2 - 10	
	26 to 29	> 12		2 - 11	1
	30 to 31	> 12		3 - 11	1 - 2
	32 to 33	> 13		4 - 12	1 - 3
	34 to 35	> 13		5 - 12	1 - 4
	36 to 42	> 14		5 - 13	1 - 4
Third	21 to 25	> 9			1 - 8
	26 to 31	> 10			1 - 9
	32 to 35	> 11			1 - 10
	36 to 42	> 13			1 - 12

Adequate care was initiated in the first trimester and followed the recommended schedule for prenatal care visits (ACOG, 1989) for the length of gestation. Intermediate prenatal care was initiated in either the first or second trimester but with fewer visits than was normally considered sufficient for the gestational period. Inadequate care was insufficient care for the length of gestation or initiation of prenatal care in the third trimester and fewer visits for gestation than was normally considered sufficient.

Race. The independent variable of race was the self-reported racial heritage of the mother identified as African-American or Caucasian. The information was obtained from the patient record for the primary study.

Birthweight. Weight in grams at time of birth was identified by patient records from the labor and delivery charts and entered as part of the primary data set.

Data Analysis

Descriptive statistical analysis included percentages, means, and standard deviations as appropriate for the demographic characteristics of the sample and for all variables in the study. The research questions under discussion were analyzed using several statistical tests. Question 1, differences in adequacy of prenatal care was investigated using cross tabulation with chi-squares statistic, a 2 x 4 factorial ANOVA was used to test research questions 2, 3, and 4. An alpha level of significance was set at .05.

Research Assumptions

With the secondary nature of the data, it is this investigator's assumption that data from the study were obtained accurately and without systematic error. The presumption is made that while the study was only able to identify quantity of prenatal care services, that quality is somewhat implied by the classification of care, although that remains a weak substitute for the measurement of quality. It is also assumed that availability of prenatal care was equal regardless of race. Stratifying the sample to include only those women with Medicaid reimbursement is assumed to control for socioeconomic level.

Several limitations were also implicit in this investigation. Minimal generalization is possible with this data. The retrospective, non-random, as well as non-experimental design certainly implies that a causal relationship cannot be identified. Possible intervening variables including known medical risks, weight gain during pregnancy, smoking, alcohol, and drug use during pregnancy were not controlled for (Broekhuizen et al., 1991; Merkatz & Thompson, 1990; Heidger, Scholl, Belsky, Ances, & Salmon, 1989). Only visits indicated as regular prenatal care visits were counted for inclusion in the sample. Visits to other medical care providers, including specialists and emergency room visits were not included. These visits are generally not included in calculations for adequacy of care and may limit the accuracy of the results.

Generally, only an associative relationship can be established in correlational data. Hopefully, this research may identify other more rigorous studies that may be needed to further explore the area under study.

Protection of Human Subjects

Approval to access the primary data set was obtained from the University Committee On Research Involving Human Subjects (UCRIHS) prior to access to data and data analysis (Appendix A). The primary study was approved by UCRIHS. This investigator did not have access to any information that would identify the subjects. Only coded subject identification was provided to the investigator. All data was reported in aggregate form. Written agency administrative approval was also obtained prior to data analysis. A copy of the research results will be given to the prenatal care center.

Results

Sample Description

The sample consisted of 321 records. Demographic and pregnancy characteristics of the sample were computed for the entire sample and by race, using cross tabulation, chi-square and descriptive statistics, including means and standard deviations.

Ninety African-American (28%) and 231 Caucasian women (72%) constituted the racial mix of the sample (see Table 2). The average age of the women was 22.4 years for both groups. A GED or high school diploma was the educational

preparation for 50% of the African-American women and 43.2% of the Caucasian women. The sample was comparable between races in employment levels, only 6.4% of the African-American and 15.3% of the Caucasian women were employed. Demographic variables were quite similar, with the exception of marital status. Eighty-two percent of the African-American women were single, compared to 52.4% of the Caucasians. Only 14.6 % of the African-American women, compared with 38.5% of the Caucasian women were married or cohabiting.

Pregnancy characteristics for the sample were similar for both groups as well. As seen in Table 3, first time pregnancies constituted 27% of the African-American pregnancies and 29% of the Caucasians. The mean gestation at the time of the first prenatal visit was 21.5 weeks (SD 7.8) for African-Americans and 19.2 weeks (SD 7.2) for Caucasian women. Only 24.3% of the total sample initiated care in the first trimester with mean prenatal visits of 8.3 (SD 3.3) for African-Americans and 10 (SD 3.6) for Caucasians. There were no significant differences between groups for the pregnancy characteristics.

Table 2

Demographic Characteristics by Race

Characteristics	African-American n=90 Number (%)		Caucasian n=231 Number (%)	
Age				
13-20	32	(35.6)	94	(40.7)
21-24	38	(42.2)	71	(30.7)
25-40	20	(22.2)	66	(28.6)
Education level				
< High School	3	(3.4)	15	(6.6)
Some High School	32	(36.4)	93	(41.0)
HS Diploma, GED	44	(50.0)	98	(43.2)
Some College	9	(10.2)	21	(9.3)
Marital Status *				
Single	73	(82.0)	121	(52.4)
Married/Cohabitating	13	(14.6)	89	(38.5)
Divorced/Separated	3	(3.4)	21	(9.1)
Employed				
Yes	5	(5.5)	26	(15.3)
No	65	(72.2)	144	(62.3)

* χ=27.26; df=2; p=<.05

Table 3

Pregnancy Characteristics by Race

Characteristics		African-American n=90		Caucasian n=231	
First Prenatal Visit (mean gestation)		21.5	(SD 7.8)	19.2	(SD 7.2)
Mean Number of Prenatal Visits		8.3	(SD 3.3)	10	(SD 3.6)
		Number	(%)	Number	(%)
Gravida					
1		24	(27.0)	69	(29.9)
2		19	(21.3)	59	(25.5)
3		21	(23.6)	49	(21.2)
4		8	(9.0)	28	(12.1)
>4		13	(14.6)	18	(7.8)
Trimester at First Prenatal Visit					
1	(1-13 weeks gestation)	17	(18.9)	61	(26.4)
2	(14-26 weeks gestation)	50	(55.6)	131	(56.7)
3	(27-40 weeks gestation)	23	(25.6)	39	(16.9)
Total Prenatal Visits					
1-5	visits	16	(17.8)	27	(11.7)
6-10	visits	49	(54.4)	96	(41.5)
11-15	visits	23	(25.6)	99	(42.9)
16 >	visits	2	(2.2)	8	(3.9)

There were no differences between the groups on selected birth outcomes. Three hundred and seven of the women (95.6%) delivered neonates 37 weeks gestation or greater. The type of delivery was also similar between groups with 77.9% of the sample delivering vaginally. The sample included no infants with very low birthweight and only 5.2% were in the LBW category (see Table 4). Normal birthweight African-American neonates were delivered 92.2% of the time and Caucasian babies 95.7%.

Results Related to Research Questions

The results of the research questions are as follows:

1) Are there differences in the adequacy of care patterns between African-American and Caucasian women?

Question 1 was examined by Chi-square analysis of association and no differences were found between race and adequacy of prenatal care patterns (see Table 5).

Intermediate prenatal care was the largest category of care for both racial groups accounting for 54.8% of the sample. Inadequate care accounted for 26% of the care for African-Americans compared to 16.9% of the care for Caucasian women.

Table 4

Birth Outcomes by Race

	African-American Number (%)		Caucasian Number (%)	
Gestation at Delivery				
>37 weeks	84	(93.3)	223	(96.5)
34-36 weeks	4	(4.4)	7	(3.0)
28-33 weeks	2	(2.2)	1	(.4)
Type of Delivery				
Vaginal	67	(74.4)	183	(79.2)
VBAC	1	(1.1)	5	(2.2)
C-Section	22	(24.4)	43	(18.6)
Birthweight Classification				
Very Low Birthweight (VLBW) < 1500 grams	0	(0)	0	(0)
Low Birthweight (LBW) 1500-2500 grams	7	(7.8)	10	(4.3)
Normal Birthweight > 2500 grams	83	(92.2)	221	(95.7)

Table 5

Adequacy of Prenatal Care by Race

	African-American Number (%)		Caucasian Number (%)	
Intensive	3	(3.3)	14	(16.1)
Adequate	13	(14.4)	52	(22.5)
Intermediate	50	(55.6)	126	(54.5)
Inadequate	24	(26.7)	39	(16.9)

χ=6.161; df=3; NS

Table 6

Mean Birthweight by Adequacy of Prenatal Care

Adequacy of Prenatal Care	Number (%) (n=321)		Mean Birthweight Weight (SD)	
Intensive	17	(5.3)	3679	(648)
Adequate	65	(20.2)	3454	(527)
Intermediate	176	(54.8)	3314	(502)
Inadequate	63	(19.6)	3308	(554)

Note. Birthweight in grams, rounded to nearest gram.

F=3.104; df=3, 320; p=.027

A 2 X 4 Factorial Analysis of Variance was used to test research questions 2, 3, and 4. The analysis resulted in a significant overall F ratio (F= 3.289; df 4; 313; p=.012). Assumptions for the 2 X 4 Factorial Analysis were tested for individual variables using univariate ANOVA. Tests for homogeneity of variance were non-significant. Although there was uneven sample size between groups which may have resulted in uneven cell sizes, the distribution of the dependent variable birthweight was found to be normal for the total sample as well as for the African-American and Caucasian groups individually. Results of the tests of the two main effects and the interaction are described below.

2) Are there differences in birthweight for different adequacy levels of prenatal care?

Differences in mean birthweight for different adequacy levels of prenatal care was found to be statistically significant. As seen in Table 6, the mean birthweight for the four adequacy categories ranged from 3308 grams for the inadequate group to 3679 grams for the intensive category. The mean birthweight of the entire sample increased as the adequacy of care increased. Post hoc tests conducted by one way analysis of variance with Scheffe tests did not indicate any two groups to be significantly different at the .05 level.

Even with exploration of the confidence intervals, group significance could not be determined due to overlapping confidence values.

3) Are there differences in birthweight between African-American and Caucasian neonates?

Differences in mean birthweight between African-American and Caucasian neonates yielded no statistical significance (see Table 7). The Caucasian neonates did, however, have a mean weight 127 grams higher than the African-American neonates mean birthweight.

4) Is there an interaction between race and adequacy of prenatal care with respect to birthweight?

As indicated in Table 8, the interaction for adequacy of prenatal care and race is not significant. The results do approach significance as best illustrated in the graph of interaction in Figure 2. As the adequacy of prenatal care increased from inadequate to intensive, the mean birthweight of the Caucasian neonates increased. African-American neonates demonstrated a increase in mean birthweight from the intensive to inadequate group. The inadequate group had the highest mean birthweight for African-American neonates. The mean birthweight for African-American neonates was also higher than the Caucasian mean birthweight in the Inadequate category alone.

Table 7

Mean Birthweight by Race

	African-American n=90	Caucasian n=231
Mean Birthweight	3269 (SD 519)	3396 (SD 533)

Note. Birthweight in grams rounded to nearest gram.

F=2.687; df=1, 320; p=.102

Table 8

Mean Birthweight by Adequacy of Prenatal Care and Race

Adequacy of Prenatal Care	African-American Mean Weight (No.)	Caucasian Mean Weight (No.)
Intensive	2994 (3)	3825 (14)
Adequate	3277 (13)	3499 (52)
Intermediate	3253 (50)	3337 (126)
Inadequate	3333 (24)	3292 (39)

Note. Birthweight in grams, rounded to nearest gram.

Interaction F=2.202; df=3, 313; p=.088

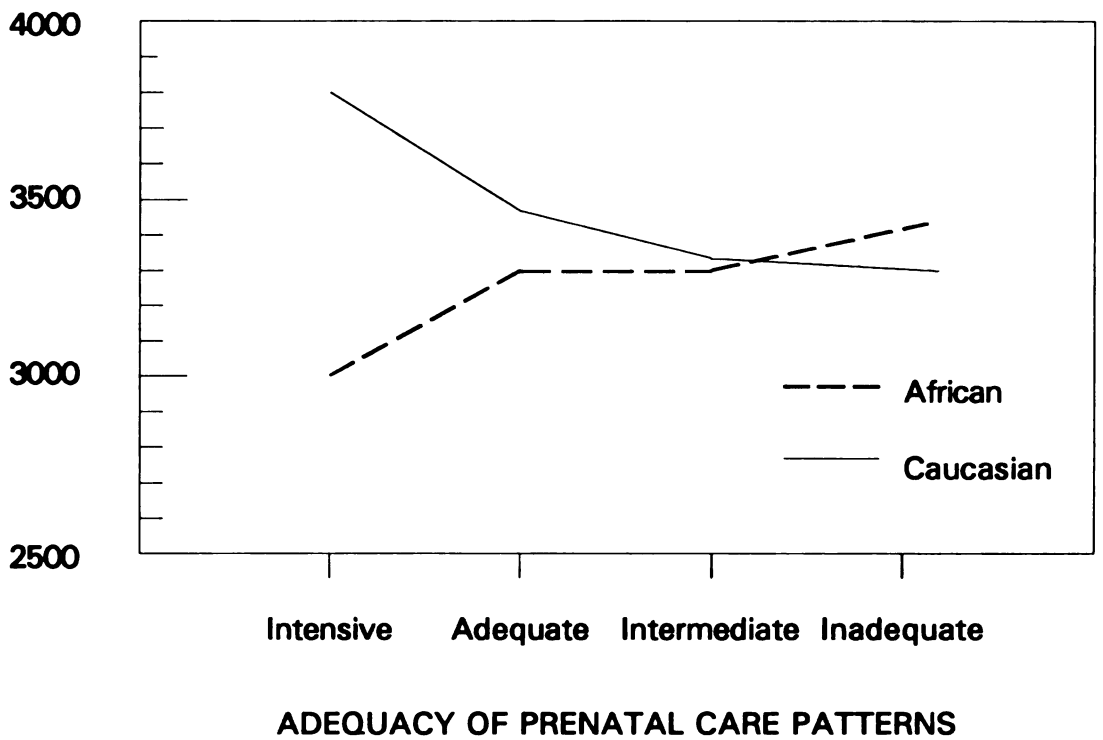

Figure 2. Graph of Interaction of Birthweight by Race and Adequacy of Prenatal Care (GINDEX).

Birthweight ranged from 2994 grams in the intensive category and increased to 3333 grams in the inadequate category for African-American neonates as seen in Table 8. The Caucasian neonates ranged from a mean birthweight of 3825 grams in the intensive category and decreased to 3292 grams for the inadequate group.

Discussion

Interpretation of Findings

The study does indicate that even within normal birthweight ranges, a relationship between birthweight and adequacy of prenatal care is statistically significant. Other research questions related to race, adequacy of prenatal care and birthweight, while not of significance statistically, certainly are of clinical importance.

Analysis of demographic characteristics as described earlier, demonstrated homogeneity between the two groups on socioeconomic, pregnancy characteristics, and selected birth outcomes. Of note, marital status was the only demographic factor that demonstrated group differences. The study design did not explore the effect of marital status on the research questions. The literature does describe marital status as a variable affecting LBW as well as prenatal care. Petitti, Coleman, Binsacca, and Allen (1990) found that African-American women who were never married, or were divorced or separated had a higher level of first trimester care than Caucasian women. In interpreting the current study results, the findings are inconsistent with the

existing research. The sample contained a high number of single African-American women, who did not begin prenatal care in the first trimester.

Adequacy of Prenatal Care

Adequacy of prenatal care patterns are determined by trimester of first prenatal visit (gestation at first visit), number of prenatal care visits, and gestation at birth. These factors directly affected the overall study results, even though significant statistical differences were not found in these individual variables, nor in the combination of these variables as an index of adequacy of care, further interpretation of the findings are important to the study results.

Although the women in the study sample delivered neonates of basically normal birthweights, the majority of the women began prenatal care in the second trimester, with 55.6% of the African-American women and 56.7% of the Caucasian women initiating care at that time. Although not considered statistically significant, there is concern that a higher percentage of African-American women (26%) began care in their third trimester compared to 16.9% of the Caucasians.

Some of the literature indicates that race does not influence when prenatal care begins (Sable et al., 1990). That does not seem to be the case in this study. McDonald and Coburn (1988) indicate that poor women start care later, and that other factors, including travel time, planned

pregnancies, and financial coverage are predictors of late prenatal care. In this sample, financial status was controlled by using only women utilizing Medicaid for prenatal care services reimbursement. With care equally available to all women in the study, financial barriers should have been decreased. However, low socioeconomic women still did not, on average, begin prenatal care early.

One possible explanation for delayed care may be that the women were not aware of the Medicaid program available to them or that the system for becoming eligible was time consuming and caused delays for the client in initiating care. The State of Michigan, where this study was conducted, has guaranteed availability of prenatal care coverage either by increasing the income level at which the reimbursement by Medicaid is still covered or by a special program for eligible women not covered by any other sources.

As seen in Table 3, the highest percentage of total prenatal visits for African-American women fell in the 6-10 visit range, accounting for 54.4% African-American women, with 41.5% of the Caucasian women having the same service frequency. Caucasian women had a higher percentage of visits in the 11-15 range (42.9%) than African-American women (25.6%). As the African-American women entered care later, the lower number of total visits was an expected finding in this study.

Both the Kessner Index (Kessner et al., 1973) and GINDEX calculation used in this study (Alexander & Cornely,

1987), automatically categorize prenatal care as intermediate or inadequate when initiated after the first trimester, even when the frequency of visits may be exactly as required for the gestational period that the women entered service. A methodological limitation of the adequacy of care index used for this study (GINDEX), as well as in literature, is that the index does not allow the researcher to determine the actual pattern of visits of the pregnant women. Looking at the exact patterns of care may determine that adequacy and it's relationship to outcomes may vary not only as adequacy is conceptualized currently, but by other factors also. In this study, the pattern of care may have impacted on birth outcomes, and may account for the higher number of normal birthweight babies than might be expected in a higher risk group of women, entering care after the first trimester. It is possible that once the women established care they received an appropriate number of visits for the time span remaining in the pregnancy, which may be considered adequate except for the delayed entry to care.

The gestational age of infants in the sample at birth, and categorical birthweight distribution also has relevance to the study results. The study results concur with findings reported by Hulsey et al. (1991) indicating higher birthweights are directly correlated with length of gestation. Gestational age was 37 weeks or greater for 96.5% of the African-American infants and for 93.3% of the

Caucasian infants (Hulsey et al., 1991) and the mean birthweight of the entire study population was 3360 grams. Birthweight by classification (see Table 4) indicates 7.8% of the African-American infants had LBW compared to 4.3% of the Caucasian infants. Traditionally LBW in African-American infants is more than twice that of Caucasian infants (Binkin et al., 1985). However, that is clearly not the case in this study.

The lower percentage of LBW and high percentage of full term gestation can be accounted for in part by the sample selection and by the standard of practice at the center. Protocols at the center included referral to a tertiary care center and perinatology for management of high medical risk patients, as the majority of the prenatal care was delivered by certified nurse midwives. All cases from the primary study where care was transferred to the tertiary care center were deleted from the sample.

Race, Adequacy of Prenatal Care, and Birthweight

It is of interest that while not statistically significant, Caucasian women had a higher percentage of prenatal care in the adequate and intensive prenatal care category and the African-American women had higher percentages in the intermediate and inadequate care group. The literature indicates African-American women receive less prenatal care than Caucasians (Petitti et al., 1990). Also indicated by the literature, fewer African-American receive prenatal care in the first trimester (Hulsey et al., 1991)

and this was substantiated in this study. Only 17.3% of the African-American women received first trimester care compared to 26.4 % of the Caucasian women. Only 23% of the total sample population received early prenatal care, which is certainly of concern. Of methodological concern, when cases with missing data on gestational age and birthweight were deleted from the sample (as they were needed to calculate adequacy of prenatal care) it was noted that 12.6% of the cases with missing data were African-American and only 5.7% were Caucasian. It is perplexing why a larger portion of the African-American data was missing, and this portion may have affected the results in some manner.

Differences in birthweight by adequacy of prenatal care were found to be significant (see Table 6) and that is supported in the literature (Murray & Bernfield, 1988; Scholl et al., 1987). The post hoc Scheffe did not show differences between groups. However, this is probably due to the conservative nature of that test and to the small size of the intensive group. The total sample showed (refer to Table 6) the highest mean birthweight in the intensive prenatal care group. Alexander and Cornely (1987) cited the intensive group as having the highest mean birthweight, and this study supports those findings. It is interesting that the range of birthweight between inadequate and intensive groups is only 371 grams and there is only a 6 gram difference between the intermediate and inadequate groups. The fact that the overall mean birthweights are in the

"normal" range may explain why the differences between the groups are small.

Comparisons between the African-American and Caucasian birthweight did not show statistical significance (refer to Table 7), although the African-American infants did weigh 127 grams less. In this comparison, the unequal group size may have had more of an effect on the results, with a larger amount of variance possible in the larger Caucasian group due to the larger group size compared to the African-American group. The literature supports differences in birthweight between African-Americans and Caucasians, but generally the differences are 50-90 grams more than this sample (Hulsey et al. 1991; Peoples & Siegel, 1983). Again, the fact that the majority of birthweights are normal may decrease the differences between the groups. Lack of literature on "normal" birthweight populations makes comparison difficult.

Differences in birthweight by race and adequacy of prenatal care were not statistically significant. However, the pattern of birthweights by group is interesting (see Table 8). African-American neonates had a higher mean birthweight than Caucasian neonates in the inadequate prenatal care group. The literature generally describes African-American infant birthweights ranging from 181 to 220 grams less than Caucasians, regardless of birthweight range or gestational age, when compared to like counterparts (Hulsey et al., 1990; Shino et al., 1986). In the adequate

care group, the African-American infants had a mean birthweight of 227 grams less than the Caucasian infants which supports birthweight differences reported in the literature (Hulsey et al., 1991; Shino et al., 1990; Wilcox & Russell, 1990). Also, of interest, is that in the intensive category there is an 831 gram difference between African-American infants and the Caucasian infants. Alexander and Cornely (1987) described the intensive group as being at the highest risk, but also having the most preferred outcomes of all the care groups. While both groups within the sample had fairly normal birthweights, the Caucasians had the highest mean birthweight in the intensive group while the African-Americans had the lowest in this care group. The reason for the higher birthweight in lower prenatal care levels is not explained, although the African-American women may have had conditions which were more likely to cause LBW.

The interaction between race, adequacy of prenatal care and birthweight, although again not statistically significant, was certainly approaching significance as seen in Figure 2. The graph of the interaction and the probability level of .08 demonstrates that the relationship is approaching significance where the African-American and Caucasian birthweights intersect at approximately 3300 grams. It appears that Caucasian infants have higher birthweights as adequacy of prenatal care increases which is supported by the literature (Alexander and Cornely, 1987;

Hulsey et al., 1991). Binkin et al. (1985) described a higher infant mortality rate for African-American infants compared to Caucasians at birthweights greater than 3000 grams. It is certainly of interest that the intersection in the relationship between race, adequacy of prenatal care and birthweight does occur at a weight greater than 3000 grams and in the intermediate care category.

Obviously, the higher birthweight at the lowest level of prenatal care for African-American women remains of clinical importance. The literature would not, however, support this finding; as stated previously, little is written on normal birthweight populations and most literature concurs that those at highest risk, have improved outcomes with increased prenatal care (Hulsey et al., 1991; Ryan et al., 1980).

Conceptual Framework

The conceptual framework for the Study of Relationship Between Race, Adequacy of Prenatal Care and Birthweight guided the research questions. In the process of human interaction (King, 1981) within the research study, race of the woman had some apparent impact on decision-making regarding prenatal care patterns although this is seen more on a clinical level than a statistical level. Decision-making regarding interaction with the health care providers to receive prenatal care did seem to make an impact on the goal or outcome identified as birthweight.

Further study is certainly indicated to validate if the weak interaction seen between race and adequacy of prenatal care is indeed present. The model may need to be adapted if these interactions are not found with larger samples. Also other factors that may influence outcomes within the conceptual framework should be investigated. Variables of investigation may include reasons for accessing care, barriers and decision-making regarding initiating prenatal care.

Recommendations for future research

To validate the study results, a replication of the study by retrospective chart review would certainly be indicated. A larger sample with equal group sizes would reduce the data analysis limitations encountered in this study. Improved documentation of critical data (birthweight and gestational age) on the clinical record would assist in gathering a larger and more accurate sample. Also collecting more data on income level, as well as any identified difficulty in accessing services in the sample may give more information for interpretation of the results.

Continued research on assessment of adequacy of prenatal care is also necessary. This study did not completely substantiate Alexander and Cornely's (1987) findings regarding prenatal care patterns especially in African-American women. Also, as indicated earlier, a more comprehensive evaluation of the intermediate and inadequate care patterns might be helpful. The development of a

measure of adequacy that not only looks at time that care began, total visits, and gestation, but also the pattern of those visits, may be helpful in determining how prenatal care services quantitatively influence birth outcomes.

Currently, in the literature as well as for this study, prenatal care visits are only considered as routine when provided by the physician or nurse midwife (or Nurse Practitioner) in the center or office. In this sample, 30% of the women were hospitalized at some point in their pregnancy. These hospitalizations are not factored into the adequacy of care patterns, nor are any other additional visits that may have been provided through services offered to clients in the prenatal care center as well as in home visits, including nursing, social work, and/or dietitian services. These visits indeed may have accounted for improved birth outcomes in groups where prenatal care appeared limited. Research on the impact of non-standard prenatal care visits as part of adequacy of care is another research need. These visits may influence birth outcomes.

The study results put forth several interesting research questions for the future. Why do African-American mean birthweights appear to increase as women receive decreasing amounts of prenatal care, while Caucasian birthweights increase for higher levels of care? Does this phenomena only occur for women who deliver normal birthweight babies? Are there other factors that influence birthweight more than prenatal care?

Qualitative research regarding how women value services and why they come for services would certainly be important. Also, research using an experimental design with different patterns of prenatal care services established for each client group, might provide important information on the effect of patterns of prenatal care by demonstrating differences in outcomes.

Further research is indicated to assess the barriers to care, further assessment of prenatal care patterns, and qualitative analysis of the values and beliefs regarding prenatal care. This will promote improved health and outcomes for pregnant women and their infants.

Implications for Advanced Practice Nurses

The Family Clinical Nurse Specialist (FCNS) in advanced practice provides primary care to women before, during, and after pregnancy. In the role of primary health provider the FCNS can be a facilitator, educator, and counselor in promoting the use of prenatal care for all women, as the study indicated adequacy of prenatal care was related to birthweight in the sample population. The FCNS with advanced skills of assessment, health promotion and education, as well as family theory is able to provide holistic health care to clients and influence changes in client choices. Advocacy and coordination activities may also be a role for the FCNS to assist clients in accessing and continuing in prenatal care.

The need for cultural sensitivity and care planning based on the individual woman is also a role for the FCNS. The current study does indicate some differences between African-American and Caucasian women that are clinically significant and identifies that there are some differences in prenatal care usage between women. Being sensitive to differences and recognizing the need for willingness to be adaptable for differing client needs is crucial. Assessment of the woman's current knowledge related to prenatal care, risk status, and potential complications of pregnancy can help identify the client's individualized needs. Utilizing the assessment, developing a cooperative plan of prenatal care with the woman, and even defining a contract for visit frequency at the beginning of care, may be a more optimal strategy for prenatal care delivery. The advanced practice nurse as an assessor, as well as a collaborator and coordinator has the skills to develop and manage these alternative plans of care that could lead to improved birth outcomes.

Targeting services and special interventions may be necessary with African-American women, as the study indicated that though not statistically significant, they often begin care later and have fewer prenatal visits. Although this study does not substantiate other literature regarding the benefits of prenatal care for African-American women, prenatal care still needs to be promoted.

Accordingly, Caucasian women who have inadequate care are also at risk and may need special interventions.

The advanced practice nurse has key skills in the provision of prenatal care, teaching, assessment, and on-going risk appraisal. As seen in this study only 20.2% of the sample were classified having adequate prenatal care visits. With many women receiving less than the optimal number of visits, the FCNS needs to maximize interventions with each encounter. This may mean developing different methods of risk assessment and teaching. Assessing the woman's health beliefs, previous compliance with health regimens, and desire for care may be important in planning prenatal care. Also an in-depth assessment of know medical risk factors, such as substance abuse, past preterm labor, and nutritional deficiencies may assist the FCNS in planning care in a different manner, with visit frequency other than the "normal prenatal care pattern". Although this study did not investigate medical risk factors, the use of on-going risk appraisal tools and patient education materials may also assist the FCNS in maximizing encounters with pregnant women.

Only 24.3% of the total sample initiated prenatal care in the first trimester. The FCNS should promote prenatal care with women who are not currently pregnant in order to influence future decision-making regarding early and adequate prenatal care when they become pregnant. During family planning, well-baby visits, and physical exams the

FCNS can educate, inform, and encourage clients to access prenatal care early and offer assistance in accessing care. Anticipatory guidance in this area may help influence healthy behaviors.

Developing and providing community outreach services can also be a function for the advanced practice nurse. This sample was taken from a population where services were available in one community site. While services were available, that does not determine accessibility for all women. Taking services to the client in the community and increasing accessibility of services may impact on the client's ability to enter care earlier and being seen more frequently (Ryan et al., 1980).

This study explored the differences in birthweight and adequacy of prenatal care between low socioeconomic African-American and Caucasian women. The conceptual framework for the Study of Relationships Between Race, Adequacy of Prenatal Care and Birthweight based on King's (1981) process of human interaction was used to guide the investigation of the study variables. The findings support a relationship between adequacy of prenatal care and birthweight, and as adequacy of prenatal care increased, birthweight increased also. These findings indicate that differences do exist and although race was not a statistically significant variable within the study, the importance to clinical practice is evident.

The FCNS has a role to play in redefining patterns of prenatal care as well as coordinating and collaborating with other providers to ensure all women have access to adequate prenatal care.

APPENDIX

APPENDIX A

PROTECTION OF HUMAN SUBJECTS APPROVAL

MICHIGAN STATE UNIVERSITY

OFFICE OF VICE PRESIDENT FOR RESEARCH
AND DEAN OF THE GRADUATE SCHOOL

EAST LANSING • MICHIGAN • 48824-1046

April 2, 1993

TO: Ms. Sharon S. Davids
113 Geneva Avenue
Battle Creek, MI 49017

RE:	IRB #:	93-136
	TITLE:	RELATIONSHIP BETWEEN RACE, ADEQUACY OF PRENATAL CARE, AND BIRTHWEIGHT IN LOW SOCIOECONOMIC WOMEN
	REVISION REQUESTED:	N/A
	CATEGORY:	1-3
	APPROVAL DATE:	04/02/1993

The University Committee on Research Involving Human Subjects' (UCRIHS) review of this project is complete. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRIHS approved this project including any revision listed above.

UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Investigators planning to continue a project beyond one year must seek updated certification. Request for renewed approval must be accompanied by all four of the following mandatory assurances.

1. The human subjects protocol is the same as in previous studies.
2. There have been no ill effects suffered by the subjects due to their participation in the study.
3. There have been no complaints by the subjects or their representatives related to their participation in the study.
4. There has not been a change in the research environment nor new information which would indicate greater risk to human subjects than that assumed when the protocol was initially reviewed and approved.

There is a maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for complete review.

UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. Investigators must notify UCRIHS promptly of any problems (unexpected side effects, complaints, etc.) involving human subjects during the course of the work.

If we can be of any future help, please do not hesitate to contact us at (517) 355-2180 or FAX (517) 336-1171.

Sincerely,

David E. Wright, Ph.D.
UCRIHS Chair

DEW:pjm

cc: Dr. Rachel L. Schiffman

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