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Length of Pregnancy and Birthweight Between Black and White Women

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LENGTH OF PREGNANCY AND BIRTHWEIGHT BETWEEN BLACK AND WHITE WOMEN

A RESEARCH PROPOSAL

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AUTHOR's NOTE

To Joan, I thank you for
your patience
and
To my Mom, Dorothy,
without you it would not
have been possible.

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Abstract

The pregnancies of Black women are complicated by adverse outcomes, such as prematurity and low birthweight, at twice the rate of complications in pregnancies of White women (Taylor, Katz, & Moos, 1995). Early access to and adequate utilization of prenatal care services are essential for successful pregnancy and birth outcomes (Rowley, 1994). The purpose of this study was to determine if there was a difference in length of pregnancy and birthweight between Black and White women at risk for preterm birth in a Preterm Delivery Prevention Program. A chart review of 79 clients enrolled in the Preterm Delivery Prevention Program from September 1, 1996 through August 31, 1997 for ages 14 - 40 was done. There were no statistically significant differences in the length of gestation and newborn birthweights between Black and White women. Further research needs to be done to explore why there was no disparity between Black and White females.

A Research Proposal

Research Problem

The pregnancies of Black women are complicated by adverse outcomes, such as prematurity and low birthweight, at twice the rate of complications in pregnancies of White women (Taylor, Katz, & Moos, 1995). Although the cause of this racial disparity is unknown, it is most likely multifactorial. The increased incidence of adverse outcomes may be strongly affected by adequacy of prenatal care (Taylor, Katz, & Moos, 1995). Early access to and adequate utilization of prenatal care services are essential for a successful pregnancy and birth outcomes (Rowley, 1994).

Use of early prenatal care is lower among Black women (Rowley, 1995). In 1992, for example, 65% of Black women in the United States began prenatal care in the first trimester, and 10% began in the third trimester or received no prenatal care. For White women the percentages were 81% and 4%, respectively (Rowley, 1995),

The purpose of this study was to determine if there is a difference in length of pregnancy and birthweight between Black and White women at risk for preterm birth enrolled in a Preterm Delivery Prevention Program in a major urban low income area.

The significance of this study was that it will assist

health care providers working with women with high-risk pregnancies to understand potential problems that can develop which could alter pregnancy outcomes. If there is a difference between length of pregnancies and birthweights, along with possible causes, nurses could provide education to prevent potentially undesirable outcomes.

Research Question

Was there a difference in length of pregnancy between Black and White women at risk for preterm birth enrolled in a Preterm Delivery Prevention Program?

Was there a difference in birthweight between Black and White women at risk for preterm birth enrolled in a Preterm Delivery Prevention Program?

Explanation of Concepts and Working Definitions

For the purpose of this study, the following definitions apply:

1. Birthweight (a) very low, less than 1,500 grams, (b) low 1,500 - 2,449 grams, (c) average, 2,500 - 4,249 grams, and (d) high is 4,250 and more grams.

2. Black: Females who self-identify themselves as members of Black or Afro-American communities in the United States. Other examples might be Jamacian, Haitian.

3. Gestational Age: (a) very preterm, 32 weeks or less, (b) moderately preterm, 33 - 36 weeks, (c) preterm, 36 weeks or less, (d) term, 37-41 weeks, and (e) postterm, 42 weeks

and more.

4. Prenatal Care Access: The timely and periodic visits made for the use of services to examine and manage the health risk of pregnant women and the developing fetus. This includes but is not limited to physical assessment, support that would facilitate compliance with treatment, and facilitating transportation and access to needed resources.

5. Preterm Delivery Prevention Program: A program designed to improve and maintain the health of high-risk pregnant women; assist women at risk for preterm deliveries to carry their babies to term; reduce the problems associated with preterm deliveries in a major urban low income area through in-home health support and community based social service interventions.

6. White: White refers to females who self-identify themselves as members of White or Hispanic communities in the United States. Examples might be Ango-Saxon, Hispanic, including Mexican, Cuban, Puerto Rican.

Literature Review

The importance of prenatal health services during the first trimester of pregnancy has been well documented (American College of Obstretricians & Gynecologists, 1988). In the 1990 - 1993 case control study of prenatal care and prevention of preterm birth, a clear and significant relationship was observed between the number of prenatal visits, the trimester of the first visit, and the adequacy of care according to

the composite index. The later variable, reflecting a more stringent standard of prenatal care, was selected by a stepwise logistrics repression analysis as the best predictor for preterm birth risk (Gomez, Delgado, Bueno, Molina, & Galvez, 1996).

The broad objective of prenatal care is "to promote the health and well being of the pregnant woman, the fetus, and the family up to one year after the infant's birth" (Public Health Expert Panel on Prenatal Care, 1989). Prenatal care includes three basic components, (a) early and continuing risk assessment, (b) health promotion, and (c) medical and psychosocial interventions with follow up (Public Health Expert Panel on Prenatal Care, 1989). However, in order for prenatal care to be effective it must be made accessible and be adequately used.

Previous research by Gortmaker & Greenberg, as well as Showstack, Budetti, & Winkler (as cited in Taylor, Katz, & Moos, 1995) has established that timely and adequate prenatal care is effective in reducing the likelihood of low birthweights and other adverse pregnancy outcomes. At least two other studies by Murray & Bernfield; and Showstack, Budetti, & Minkler (as cited by Rowley, 1995) suggest that early prenatal care has a more positive effect on birth outcomes for Blacks than for Whites.

Adequate prenatal care is believed to result in better pregnancy outcomes, including reduced maternal infant

morbidity and mortality, reduced risk for preterm delivery, and for low birthweight (Morbidity and Mortality Weekly Report, 1996/August 2).

For expectant mothers of all ages and income groups, the same advice has been given. Early prenatal care increases the chance for a healthy baby. However, a new Johns Hopkins Study (Health Newsfeed #563, American Journal of Public Health, 1997) suggests the story is a little more complicated than that. It found that mothers who live in high-risk neighborhoods, marked by crime, poverty and violence, had more low birthweight babies, even when they received regular prenatal care. It is not clear why such a link exists. It may be due to stress, fear, or other factors.

Investigators have demonstrated that the incidence of no prenatal care is higher for women who are teenagers, unmarried, Black, or of other non-white racial/ethnic groups; have less than 12 years of education; were born outside of the United States; and have given birth to more than two children (Elam-Evans, Adams, Garguillo, Kiely, & Marks, 1996).

The overall reduction in risk for poor pregnancy outcomes has been attributed to a number of factors, including better availability and higher use of prenatal care (Brett, Schoendorf, & Kiely, 1994). Most studies show that Black women are less likely to receive timely prenatal care than are White women (Brett, Schoendorf, & Kiely, 1994).

Many factors, such as stress, knowledge about prenatal care,

health risk behaviors, social class and ethnicity, cultural differences, and differences in the use of prenatal technologies have been examined in an effort to understand the disparity in prenatal outcome between White and Black women (Brett, Schoendorf, & Kiely, 1994; Cooper, Goldenberg, DuBar, & Davis, 1994; Lobel, 1994; Parker, Schorndorf, & Kiely, 1994).

The incidences of several adverse pregnancy outcomes, including low birthweight, prematurity, and neonatal morbidity and mortality are higher in Black women than in White women (Taylor, Katz, & Moos, 1995). The cause for the racial disparity is unclear. Investigators have postulated that differences in socioeconomic status, access to the use of prenatal care, biologic variations, such as incidence of hypertensive disorders, and differences in health care providers may be the causes of the disparity (Taylor, Katz, & Moos, 1995).

Taylor, Katz, & Moos (1995) when discussing racial disparity in pregnancy outcomes, stated the following:

> We hypothesized that the racial disparity in adverse pregnancy outcomes would be strongly affected by the amount and timing of prenatal care. We believed that if we could match groups for the variables of socioeconomic status, access to health care and use of health care, and control

> time of onset of prenatal care, we might reduce the racial disparity. By using a teen clinic at the University of North Carolina, Chapel Hill, who have high-risk complications, the decrease in racial disparity for pregnancy outcome and overall improvement in pregnancies outcomes for this high-risk population occurred. Intensive and comprehensive prenatal care did decrease the racial disparity in adverse outcomes within their cohort (p. 482).

Basic knowledge about the importance of prenatal health and utilization is essential in the prevention of preterm delivery and adverse birth outcomes (Sharma, Synkewecz, Raggio, & Mattison, 1994). Lack of prenatal care is strongly associated with an increased risk for low birthweight (< 2,500 g) infants, preterm delivery, and maternal and infant mortality (Sharma, Synkewecz, Raggio, & Mattison, 1994). Preterm delivery and very low birthweight (< 1,500 g) continue to be major contributors to infant mortality despite the efforts of prenatal care programs to reduce the incidence of complications for both mother and infant (Creasy, 1993). Some investigators have argued that inadequate utilization of prenatal care is to be considered when trying to explain the high rate of preterm delivery and adverse birth outcomes

(Kotelchuck, 1994).

Infants who weigh less than 5.5 pounds (2,500 grams) are considered low birthweight and are 40 times more likely to die during the first month of life than normal birthweight infants (Klein, 1996). They are also three times more likely to experience serious health and developmental problems throughout their childhood (Klein, 1996).

Theoretical Perspective/Conceptual Framework

Pender's model on Health Promotion forms a conceptual framework which helps base an understanding of individual, family, and community health definitions. Such definitions provide the foundation on which health promotion efforts for persons and aggregates can be based. To address the promotion of health, one must know what is the desired health outcome and how its achievement will be measured at individual, family and community levels (Pender, 1997, p. 34).

Cognitive-perceptual factors that are proposed in the Health Promotion Model as directly affecting predisposition to engage in health-promoting behaviors include importance of health, perceived control of health, perceived self-efficiency, definition of health, perceived health status, perceived benefits of health-promotion behaviors, and perceived barriers to health-promoting behaviors (Pender, 1997, p. 66).

A number of modifying factors are proposed as indirectly

influencing patterns of health-behaviors. These factors include demographic characteristics, biological characteristics, interpersonal influence, situational factors, and behavioral factors. According to Pender's Health Promotion Model, modifying factors exert their influence through the cognitive-perceptual mechanism that directly affects behavior (Pender, 1997, p. 68).

The Health Promotion Model is proposed as an explanation of why individuals engage in health actions. Using this model as a foundation may explain why different individuals react differently to health promotion activities, such as prenatal care, life stresses, and situations which can influence health outcomes positively and negatively. The health status of individuals and families is impacted by cultural, occupational, and physical environments. Prevention and health promotion are both individual and social issues and consequently must be dealt with at cognitive-perceptual levels. Individual changes in behavior without a supportive environment to make continuing enactment of change possible will result in frustration and failure of health-promotion efforts (Pender, 1997).

Research Design and Methodology

This was a nonexperimental ex-post facto research design, summarizing data on single live births. Data was collected from convenience sample of medical records of 79 clients

who participated in the Preterm Delivery Prevention Program from September 1, 1996 through August 31, 1997. The records were of Black and White females only between the ages of 14 and 40.

Data was obtained by chart review of clients who were enrolled in the Preterm Delivery Prevention Program and continued with the program until delivery occurred (see Appendix A - Chart Review). The participants, in order to be in the program, had some preexisting factors putting them at risk for preterm delivery, such as previous preterm or LBW delivery, a teen, substance abuse, physical/emotional abuse, prior or current pregnancy complications, history of sexually transmitted diseases.

Information summarized included (1) race of mother, (2) gestational age of infant, and (3) birthweight of baby. Other demographic data collected included total number of participants in the program in the specified time period and total number of participants of other ethnic origins. During chart review, confounding variables needed to be identified such as, age of mother, occupation, economic status, medical problems, prenatal care, substance abuse, prior pregnancies, physical/emotional abuse, marital status, smoker, and highest level of education.

The basic purpose of ex-post facto research is essentially the same as quasi experimental research, to determine the

relationship among variables. The investigator does not have control of the independent variables because it had actually occurred (Polit & Hunger, 1991). The dependent variables of length of pregnancy and birthweight were not changed; however, the independent variable of prenatal care could potentially alter outcome.

In order to determine if statistically significant differences in birthweight and length of pregnancy for Black and White females occurred, a Chi square (II) test was done. Using data obtained from the chart reviews, a statistical mean was obtained for Black and White females for birthweight.

Types of errors which may have been encountered include inadequate population distribution between the two groups, inadequate sample size, and multiple confounding variables which have been previously described.

Analysis

A Chi square (II) test was done incorporating Black clients of 37 weeks gestation and greater and less than 37 weeks gestation, as well as White clients of 37 weeks gestation and greater and less than 37 weeks gestation. The level of significance is set at .05.

There were 18 Black clients less than 37 weeks gestation and 41 Black clients 37 weeks gestation or greater. There were 4 White clients less than 37 weeks gestation and in the 37 weeks gestation or greater there were 16 White clients. There was a total of 79 clients (see Table B1, Appendix B).

The expected frequencies for Black clients of less than 37 weeks was 16.43, and for Black clients 37 weeks or greater it was 42.57. White clients expected frequencies for less than 37 weeks gestation was 5.57 and White clients expected frequencies for 37 weeks gestation or greater was 14.43 (see Table B2, Appendix B).

The observed and expected outcomes are shown in Table B3, Appendix B. The Chi square (II) value rounded to the nearest hundredth place is .82. df = 2 (Sharp, 1982, p. 41). Table value = 5.99 per critical values of Chi square (II) (Sharp, 1982, p. 230).

Thus, the null hypothesis was accepted. There was no statistically significant difference between Black and White women in this sample for length of gestation.

The mean birthweight of Black clients in the Preterm Delivery Prevention Program was 2926.87 grams for single live births. The mean birthweight for White clients was 3291.2 grams for single live births.

A Chi square (II) test was done incorporating Black clients who delivered infants 2,500 grams or greater and < 2,500 grams, and for White clients who delivered infants 2,500 grams or greater and < 2,500 grams (see Table C1, Appendix C).

There were 44 Black clients who delivered infants 2,500 grams or greater and 15 Black clients who delivered infants who were < 2,500 grams. A total of 59 Black clients was

analyzed. For White clients who delivered infants 2,500 grams or greater there were 16. For deliveries < 2,500 grams there were 4, making a total of 20 White client deliveries. The expected frequencies (Table C2, Appendix C) for Black clients delivering infants of 2,500 grams or greater was 44.81; for <2,500 grams it was 14.19. The expected frequencies for White clients delivering infants of 2,500 grams or greater was 15.19, and for < 2,500 grams it was 4.81. The observed and expected outcomes are described in Table C3, Appendix C. The Chi square (II) value rounded to the nearest hundredth place is .24. df = 2 (Sharp, 1982, p. 41). Table value = 5.99 per critical values of Chi square (II) (Sharp, 1982, p. 230).

Thus, the null hypothesis was accepted. There was no statistically significant difference between Black and White women in this sample for birthweight.

Results

The results obtained from this group of subjects in the Preterm Delivery Prevention Program were not statistically significant. However, this does not mean that they were not clinically significant. Clients enrolled in this Preterm Delivery Prevention Program, whether they were Black or White, had similar outcomes. The research done has shown that differences in length of gestation and birthweight between Black and White women were obliterated among clients enrolled in this program, thus making the result clinically significant.

Discussion

Information obtained cannot be generalized to the population of Black and White pregnant females who are at high risk for preterm delivery. This program had limitations since it had predominately Black clients (the White group also included Hispanic pregnant females). The clients that participated in the program had already known high-risk factors, such as previous preterm delivery and/or labor, substance abuse, domestic/emotional abuse, diabetes and other medical problems.

Confounding variables, such as age of mother, occupation, economic status, prenatal care, prior pregnancies, marital status, smoker, and highest level of education could have influenced the data that was researched. However, these confounding variables were not addressed in this study and should be considered in future research.

Further research also needs to be done to identify possible causes of differences in length of pregnancies and birthweight in Black and White clients who are high risk. Identifying clients who are considered high risk when they enter prenatal care might influence their outcomes. An unusually high number of clients entered prenatal care in the first trimester. It is unknown as to why they entered prenatal care early; however, a possibility is that the clients had been previously identified as high risk. Having this knowledge, they entered prenatal care earlier than clients at low risk. This possibility cannot

be substantiated without further research.

The White clients in this program were a small group and incorporated the Hispanic clients, who were mostly undocumented with minimal prior health care. Many of the clients had identified other risk factors, such as domestic violence, emotional as well as physical abuse, other health problems (diabetes, hypertension) which could intensify complications and skew the results.

The sample size was a select group of clients who had been referred to the Preterm Delivery Prevention Program due to their identified high-risk status. Many of the women in this program had limited access to medical care, previous history of preterm birth or complications related to their previous pregnancies/births. Poverty was another factor which may have related to outcomes of clients' pregnancies.

In the White group there were 20 clients, of which 3 were teens (18 years or less). In the Black group of 59 clients, 13 were teens (18 years or less). Excluding these clients might have changed the results since many in this high-risk group had multiple factora which could influence their prenatal outcome.

There was no control over program interventions. Some of the interventions identified were education of clients and number of visits to the clients. These interventions, if measured, may have an effect on the outcome.

Early interventions and access to prenatal care continue to predominate the theme for this group. Multiple visits by the registered nurse and/or aide educated the clients in their prenatal care and potentially altered their prenatal outcome. Continued research in this area is warranted, as well as use of measurement tools designed to evaluate program interventions.

Pregnancies for Black women continued to be complicated by adverse outcomes of prematurity and low birthweight. More attention to factors that are affecting these outcomes is necessary. Educating the health professions on what interventions are needed will help to further understand reasons for pregnancy complications among Black women.

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APPENDIX A

CHART REVIEW

Patient Number	Length of Pregnancy	Birth-weight	Age	Occupa-tion	M/S	Income	Medical Problems	Substance Abuse	Physical/ Emotional Abuse	Prior Preg-nancies	Ethnicity

APPENDIX B

GESTATIONAL AGES AND EXPECTED FREQUENCIES AND OUTCOMES

Table B1

Deliveries of Greater/Lesser than 37 Gestational Weeks

Group	Less	Equal or Greater	Total
Black	18	41	59
White	4	16	20
Grand Total	22	57	79

Table B2

Expected Frequencies of Greater/Lesser than 37 Gestational Weeks

Group	Less	Equal or Greater
Black	22 X 59/79 = 16.43	57 X 59/79 = 42.97
White	22 X 20/79 = 5.57	57 X 20/79 = 14.43

Table B3

Observed Outcomes and Expected Frequencies of Greater/Lesser than 37 Gestational Weeks

	Less		Equal or Greater	
Group	Observed	Expected	Observed	Expected
Black	18	16.43	41	42.57
White	4	5.57	16	14.43

APPRNDIX C

BIRTHWEIGHTS AND EXPECTED FREQUENCIES AND OUTCOMES

Table C1

Birthweights of Greater/Lesser than 2,500 Grams

Group	Equal or Greater	Less	Total
Black	44	15	59
White	16	4	20
Grand Total	60	19	79

Table C2

Expected Frequencies of Greater/Lesser than 2,500 Grams

Group	Equal or Greater	Less
Black	60 X 59/79 = 44.81	19 X 59/79 = 14.19
White	60 X 20/79 = 15.19	19 X 20/79 = 4.81

Table C3

Observed Outcomes and Expected Frequencies of Greater/Lesser than 2,500 Grams

	Equal or Greater		Less	
Group	Observed	Expected	Observed	Expected
Black	44	44.81	15	14.19
White	16	15.19	4	4.81