To the Graduating Council:

I am submitting herewith a dissertation written by Darlene Elizabeth Jesse entitled "Holistic Obstetrical Problem Evaluation (HOPE): A Midwifery Theory to Predict Maternal and Perinatal Health Outcomes." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Nursing.

Debra C. Wallace

Debra C. Wallace, PhD, RN, Major Professor

We have read this dissertation
and recommend its acceptance:

Martha R. Alligood

Martha R. Alligood, PhD, RN

Mary Ann Curry

Mary Ann Curry, RN, DNSc, FAAN

Patricia Droppleman

Patricia Droppleman, PhD, RN

Wm. L. Seaver

William Seaver, PhD

Accepted for the Council:

Lew Minkel

Associate Vice Chancellor and
Dean of the Graduate School

HOLISTIC OBSTETRICAL PROBLEM EVALUATION (HOPE): TESTING A MIDWIFERY THEORY TO PREDICT MATERNAL AND PERINATAL HEALTH OUTCOMES

A Dissertation
Presented for the
Doctor of Philosophy Degree
The University of Tennessee, Knoxville

Darlene Elizabeth Jesse
December, 1999

COPYRIGHT

Copyright © Darlene Elizabeth Jesse, 1999
All rights reserved

DEDICATION

This dissertation is dedicated to my companion, Ray Walker, who provided constant support during this academic endeavor, and to vulnerable mothers and their infants who are affected by disharmony of body, mind, soul or self.

ACKNOWLEDGEMENTS

Many persons provided encouragement and practical support throughout my doctoral studies. First, I would like to thank my committee members: My dissertation chair Dr. Debra Wallace encouraged me to work toward excellence. I appreciated her level of scholarship, expertise and excitement about my research ideas. I'll always remember Dr. Pat Droppleman as a mentor and as a compassionate and positive force for me personally and professionally. I thank Dr. Martha Alligood for voicing her level of enthusiasm with my academic growth and theoretical understandings, and her open-minded approach to teaching. I admired Dr. Curry's clear vision, concise direction, quick response and exemplar example for improving maternal and perinatal outcomes through teaching, policy and research. Dr. Seaver was a kind mentor whose sense of wonder encouraged me to discover new knowledge with statistics.

I appreciated Dr. Sandra Thomas' wisdom that was comforting, inspiring and challenging. Thank you to Dr. Charles Darling, Dr. Ran Neiger, and Jan Kaman who assisted me with access to clients and records within their practice sites, and to the staff members at these sites who generally looked out for me, whether it was pulling charts, sharing stories or helping me arrange the flow of patients for my interviews. I thank my bright and compassionate research assistant, Lisa Schultz for all of her hard work. Thank you to Sigma Theta Tau, Gamma Chi Chapter, for their financial support of my study. This funding allowed me to give back to the women who participated in my study.

I am grateful to the many people in my life whose love, faith and support have accompanied me throughout the long journey this dissertation symbolized: Ray Walker,

my companion, who provided tremendous "partner support" and unwavering confidence in me. My sons, Ethan and Jeremiah Fesperman, were my best cheerleaders along with my mom and dad and the Walkers! I was grateful for the ongoing emotional and intellectual support from my colleague and friend, Heidi Ehrenberger; the caring and kindness of Karen Reesman and Sheila Bowen; the encouragement from my friends Michelle Balliet, Kathy Kirkman, Corinne Rovetti, Martha and Norby Scott, Ruth Surgal, Bonnie Johnson, Barbara Rogers, Perline Gilpin, Rena Harris; the support from my church family; my neighbors, Dr. Carl Barth, Dr. Carl Wagner and Dr. Doris Gove, and from my work colleagues. Finally, I thank the women in my study for teaching me the importance of listening, so that I could gain new knowledge about the importance of body, mind and soul to health.

ABSTRACT

The primary purpose of this study was to test the Holistic Obstetrical Problem Evaluation (HOPE) theory, derived from Watson's Theory of Care (1979), by examining the relationship of socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components to birth weight, gestational age, APGAR score and unplanned cesarean birth. A prospective correlational research design was used. A convenience sample of 120 pregnant women, between ages 14-44 and 16-28 weeks gestation from three prenatal sites was interviewed using: (1) Socio-demographic factors; (2) the Prenatal Psychosocial Profile (PPP); (3) the Abuse Assessment Screen (AAS); (4) the Spiritual Perspectives Scale (SPS); and (5) perception of pregnancy questions. Biophysical data from prenatal records was transferred to the Bowman Gray Risk Index for scoring and birth outcomes were obtained from delivery records.

Multiple and logistic regression analysis revealed that the HOPE theory was partially supported to predict birth weight, gestational age and preterm birth and not supported for APGAR score. Socio-demographic factors, psychosocial, spiritual and perceptual components were significantly related to perinatal outcomes, while factors within the biophysical component were not.

African-American race from the socio-demographic factors and no support from partner from the psychosocial component were related to delivering lower birth weight infants. Lower levels of self-esteem and use of drugs and alcohol from the psychosocial component, and active religiosity from the spiritual component were associated with a shorter length of gestation at birth. Multiple logistic regression analysis revealed that

lower levels of self-esteem, from the psychosocial component, and more negative views towards the pregnancy from the perceptual component, emerged as significant predictors for preterm birth. Newly reported findings included the relationship of: 1) partner support with birth weight; 2) self-esteem and religiosity with weeks of gestation; and 3) self-esteem and perception of pregnancy with preterm birth. Two significant findings, the relationship of African-American race with birth weight, and use of drugs and alcohol with gestational age have been reported previously. Testing the HOPE theory to identify both risks and protective factors for delivering lower birth weight infants, delivering infants at an earlier gestation or at preterm gestation provided preliminary support for: 1) further development of the theory of HOPE; 2) a holistic approach to prenatal care assessments and interventions; 3) holistic instrument development; 4) delivery system models that allow time for a holistic approach to prevent lower birth weight, early gestation and preterm birth and; 5) policy and payment decisions that may improve birth outcomes. Further research on the HOPE theory with a larger and more diverse sample is needed.

TABLE OF CONTENTS

CHAPTER ONE: INTRODUCTION 1

The Problem, Background and Significance 3
Theoretical Rationale 8
Summary 14
Propositions in the HOPE theory: Holistic Obstetrical Problem Evaluation 15
Purpose 16
Theoretical definitions 16
Research questions 18

CHAPTER TWO: REVIEW OF THE LITERATURE 19

Risk Assessment Screening: Development and Description 19
Socio-demographic Factors 25
The Body: Biophysical Component 30
The Mind: Psychosocial Component 31
The Soul: Spiritual Component 40
The Self: Perceptual Component 45
Summary 47

CHAPTER THREE: METHODS 50

Research Design 50
Sample 51
Operational Definitions 52
Measurement 54
List of Variables and How They Were Measured 55
Data Collection 62
Protection of Human Subjects 64
Data Analysis 65
Delimitations 66
Summary 69

CHAPTER FOUR: RESULTS 70

Sample 70
Descriptive Information 71
Sociodemographic Factors 72
Biophysical Component 73
Psychosocial Component 74

Spiritual Component 77
Perceptual Component 78
Measurement 79
Birth Outcomes 79
Descriptive Sample Summary 81
Multiple and Logistic Regression Analysis 82
Summary 92

CHAPTER FIVE: DISCUSSION 94

Question One: Relationship of the HOPE Theory and Birth Weight 95
Question Two: Relationship of the HOPE Theory Gestational Age and Preterm Birth . 97
Question Three: Relationship of the HOPE Theory and APGAR Score 103
Question Four: Relationship of the HOPE Theory and Cesarean Birth 104
Conclusions 104
Limitations 107
Strengths 108
Implications and Recommendations 110
Summary 116
References 118
Appendices: 136
Appendix A. Socio-demographic Measures 137
Appendix B. Biophysical Measures 139
Appendix C. Psychosocial Measures 141
Appendix D. Spiritual Measures 148
Appendix E. Perceptual Measures 153
Appendix F. Outcome Measures 155
Appendix G. Power analysis 157
Appendix H Smiley Faces and Anchors 160
Appendix I Letters of Support 163
Appendix J Permission to Use Instruments 167
Appendix K Informed Consent 173
Appendix L IRB Letters 175
Vita 179

LIST OF FIGURES

FIGURE **PAGE**

1. Holistic Obstetrical Problem Evaluation 9

2. HOPE Theory and Birth Weight 86

3. HOPE Theory and Gestational Age 89

4. HOPE Theory and Preterm Birth 91

LIST OF TABLES

TABLE **PAGE**

1. List of Variables and How They Were Measured 55

2. Socio-demographic Data on Partner, Ethnicity, Insurance, and Problems with Access to Prenatal Care 71

3. Socio-demographic Data on Education, Gravida, Parity, Number of Prenatal Visits at Time of Interview, and Weeks of Gestation at Time of First Prenatal Visit 73

4. Psychosocial Profile for Stress, Partner Social Support, Other Social Support and Self-Esteem 74

5. Psychosocial Profile for Depression, Lifestyle Risks and Abuse 76

6. Average Birth Weight, Gestational Age and APGAR Score 79

7. Birth Outcomes: Low Birth Weight (LBW), Preterm Birth (PTB), APGAR <7 @ 5 Minutes and Unplanned Cesarean Birth 81

8. Description of LBW Infants 81

9. Comparison of Scores: Stress, Partner Support, Other Support, Self-esteem and Abuse 82

10. HOPE Theory and Birth Weight 85

11. HOPE Theory and Gestational Age 87

12. HOPE Theory and Preterm Birth: Reduced Model. 90



Geddes - Jack & Maneesha
© Ann Geddes
Published and Distributed by
Portal Publications Ltd.
Corte Madera, California
Litho in U. S. A, Canada 350

CHAPTER ONE

INTRODUCTION

The purpose of this study was to test the Holistic Obstetrical Problem Evaluation (HOPE) theory derived from Watson's Theory of Human Caring (1979) by examining the relationships of socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components to the incidence of low birth weight babies and other adverse outcomes of pregnancy. Low birth weight (LBW), defined as less than 2500 grams, or 5 pounds, 8 ounces (World Health Organization, 1950), and preterm birth (PTB) defined as born prior to 37 completed weeks of gestation (Ventura, Martin, Curtin, & Mathews, 1997) are public health problems of the first order, prevalent both in the nation and in the state of Tennessee. In 1996, approximately 7.4% of infants born in the United States and 8.8% of infants born in Tennessee were LBW. In 1995, 11% of infants born in the United States and 12.6% of infants born in Tennessee were preterm. This rate of preterm birth in the United States has steadily risen17% since 1981 (Kids Count Data Book, 1997; United States Department of Health & Human Services (USDHHS, 1996; Ventura et al, 1997).

Prevalence of LBW and preterm birth (PTB) is even higher among African-American babies, with low birth weight reaching to 13% in the United States and to 14.2% in Tennessee. In 1996,17.7% of African-American infants in the United States and 18.7 % of African-Americans infants in Tennessee were preterm, whereas10.9% of white infants in Tennessee were preterm (Ventura et al, 1997; March of Dimes, 1999). Babies born LBW and/or preterm have increased risk for neonatal mortality, morbidity,

respiratory and neurodevelopmental problems, and other long term disabilities. Infants born preterm are 28 times more likely to die within their first month of life than are term infants (37-41 weeks of gestation) (Paneth, 1995; Ventura et al, 1997). These trends must be changed for our nation to meet the Healthy People 2000 target wherein low birth weight would be no more than 5 percent of all live births and very low birth weight babies (VLBW), defined as less than 1500 grams (Ventura et al, 1997, no more than 1 percent of live births by the year 2000 (USDHHS, 1996).

The following elements of need to be addressed to abate the trend of LBW and PTB: 1) work to eliminate poverty and racism; 2) provide women pre-pregnancy counseling to prevent the occurrence of birth defects, to control for medical problems, and to reduce lifestyle behaviors harmful to fetal development; 3) assure women's access to user friendly and culturally congruent prenatal care services; 4) provide prenatal care that includes health promotion as well as early and continuous risk assessment screening; 5) encourage sensitive and appropriate technological, clinical, and psychosocial support interventions; 6) build greater community involvement that creates a culture of care; and finally, 7) advance risk assessment research to identify and understand patterns which place women and their babies at greater perinatal risk (Hogue & Hargraves, 1993; Ruzek, 1993; Shiono & Behrman, 1995). This research explored the seventh element by seeking to identify and understand patterns of perinatal and maternal risk for low birth weight, preterm birth and other adverse pregnancy outcomes as a holistic approach to improving maternal and infant health.

The Problem, Background and Significance

Low birth weight, and its major predecessor, preterm birth, are more common in the United States than in Western European nations and the frequency of these two problems accounts for our nation's high infant mortality rate. Unlike the United States, many European countries such as Sweden have taken the lead in preventing high risk pregnancy. However, the United States has lagged behind, ranking 22nd among nations for infant mortality. The United States has one of the highest rates of LBW of any industrialized country and as a consequence, a high incidence of infant morbidity and mortality, especially among African-American women and the poor (Institute of Medicine, 1985; Paneth, 1995). In 1996, more than 287,000 low birth weight babies were born in the United States (7.4/1000) and both infant mortality (8.0/1000) and low birth weight and preterm birth appear to be on the rise in the United States, particularly in the South (Kids Count Data Book, 1997, Ventura et al, 1997).

Within the United States, Tennessee ranks among states with the worst record. Tennessee is among six states with the highest percent of low birth weight babies (8.8/1000) and among the 10 states in the nation with the highest rate of infant mortality (8.9/1000) (Kids Count Data Book, 1997). The risk of death within the first year of life is more than twice as high for African-American infants than for white infants in the United States generally, and the disparity is even greater in Tennessee. The infant mortality rate for African-American infants in Tennessee (18.0 /1000) is three times that of whites (6.2/1,000) and low birth weight for African-American infants (14.7/1000) is more than double that of whites (7.1/1,000), suggesting that inequality of opportunity in life is

experienced from birth (Paneth, 1995; Tennessee Department of Health,1990, 1994).

A review of the literature revealed that in spite of the potential benefits of perinatal/maternal risk assessment as one preventive approach to addressing the problem of low birth weight, it is a national objective yet to be achieved. The Institute of Medicine's (1985) evaluation of 13 risk assessment instruments, Selwyn's (1990) evaluation of 60 risk assessment systems, and Wall's (1988) review of risk assessment systems revealed that most risking instruments correctly identify high risk pregnant women who subsequently have an adverse pregnancy outcome only 30-70% of the time. Traditionally, risk assessment has had a biological/medical and epidemiological focus that emphasized testing sensitivity and specificity of biophysical risk assessment instruments. Gains in instrument sensitivity, defined as, correctly identifying pregnant women as high risk who subsequently have poor outcomes, may compromise the levels of instrument specificity, defined as, correctly identifying women as low risk who subsequently have healthy birth outcomes. As a result of increasing the likelihood of identifying women who may have a poor birth outcome, low risk women may be identified as high risk who subsequently have good birth outcomes. This imbalance of sensitivity to specificity in risk assessment instruments results in either costly and unnecessary interventions for low risk women, mistakenly considered high risk, or/or the mislabeling of high risk women as low risk, thus denying the women needed interventions.

Few risk assessment approaches (from which risk assessment tools are developed) included risk factors that were modifiable or preventable, such as lifestyle risks. Instead, assessments concentrated on demographic and biophysical risk factors that are not modifiable such as race, age, education, or previous history of delivering a LBW baby. Another limitation of most risk assessment systems has been the lack of attention to the influence of social and psychological factors to pregnancy outcomes, even though prediction of maternal risk is improved when biomedical and psychosocial factors are combined (Herrera, Salmeron, & Hurtado, 1997; Smilkstein, 1986).

In addition, nursing models for assessing high risk pregnancy are in the early stages of development. Only two published reliable and valid nursing instruments were found that measured psychosocial factors related to pregnancy outcomes (Curry, Campbell & Christian, 1994; Norbeck, Lindsey, & Carrieri, 1981). Also, few nursing outcome studies that used tested instruments examined prenatal factors and birth outcomes (Curry, 1997; Norbeck & Anderson, 1989; Norbeck, DeJoseph & Smith 1996; Norbeck & Tilden, 1983). There are few birth outcome studies in the nursing literature that use tested instruments and include a theoretical base, and the outcome studies in the medical literature have a biophysical emphasis. This review pointed to the need for a holistic evaluation of maternal/perinatal risks.

Although there are problems developing risk assessment criteria, the Institute of Medicine (1985) and experts in the field (Repke, 1995) suggested that further developments and research in the area of risk assessment are vital to determining specific risk factors that may be linked to low birth weight and other adverse pregnancy

outcomes. Also, managed care is emphasizing standardized risk management criteria as part of the prenatal record to enhance a provider's clinical judgement, reduce high risk pregnancy, contain costs, and decrease law suits (Brown, 1995). Often traditional prenatal care emphasized biophysical risk factors and minimized psychosocial or behavioral factors, even though prediction of LBW has been greater when prenatal care included both biophysical and psychosocial factors (Herrara, Salmerson & Hurtado, 1997; Dower, Miller, O'Neil & the Task Force on Midwifery, 1999).

The positive birth outcomes associated with midwives have been attributed to this holistic and preventative philosophy wherein the client is included in all aspects of care (Roberts, 1996). There are several examples of research that examined the effectiveness of midwifery philosophy on birth outcomes. Fischler & Harvey's (1995) study of low income women (N=717) who received prenatal care from midwives. Women who were cared for by midwives delivered higher birth weight babies than women cared for by other providers when other factors known to affect birth weight were controlled. In addition, women whose prenatal care was provided by midwives also had a reduced rate of low birth weight than women cared for by physicians (Brown & Grimes, 1995). A 1995 meta-analysis of nine studies compared the birth outcomes of women attended by nurse-midwives with those attended by physicians. Although there were many differences in care, there were few differences in outcomes. The most common difference was a reduced rate of low birth weight babies born to women attended by nurse-midwives (Brown & Grimes, 1995).

Because of the increasing financial pressures and time constraints traditional health care models focused on productivity standards in prenatal care, limited time associated with care, emphasized the medical model and minimized the benefits of a midwifery model of care. Unlike traditional health care models, collaborative models looked at costs for an entire episode of pregnancy and the long term benefits of preventing costly birth outcomes such as low birth weight, preterm and cesarean birth. Emerging systems of health care will increasingly be moved by empirical data that find ways to reduce costs, increase client satisfaction and improve quality of care. This challenges midwives and nurse-practitioners to scientifically evaluate a holistic view as it relates to positive birth outcomes, and to provide caring holistic interventions, based on theory and science, to lower costs, improve outcomes, improve profitability, enhance consumer satisfaction or some combination of these objectives (Dower et al, 1999).

Discovering more about the multifaceted and synergistic influences of LBW and preterm birth is one step toward developing standardized holistic criteria for risk instruments that may lead to more effective care for clients and reduce both financial and human costs. It is highly relevant for nurses and midwives to contribute expert clinical skills and knowledge toward preventive approaches to this problem. In addition, incorporating the pregnant woman's perceptions of her pregnancy may improve birth outcomes by helping her recognize her own developing pattern of risk, thus giving her the opportunity to change.

Theoretical Rationale

A Holistic Approach

Watson's Theory of Human Caring (1979) was used as the rationale for the development and testing of the Holistic Obstetrical Problem Evaluation (HOPE) theory with maternal and perinatal health outcomes. Although this research is in accord with Watson's theory generally, the most meaningful aspect of Watson's theory was the proposition that the harmony of body, mind and soul leads to the highest form of health. The emphasis on harmony of body, mind and soul leading to health or disharmony of body, mind and soul leading to health or illness provided the rationale for development and testing of the theory of HOPE (Holistic Obstetrical Problem Evaluation, Figure 1).

The unity of mind-body-soul is described within Watson's (1979, 1985) evolving and emergent world view. Watson's (1979, 1989) theory of care proposes a holistic-dynamic approach wherein the body, mind and soul are interrelated, each part a reflection of the whole, yet the whole is greater than the sum of the parts. Watson (1989) quotes Emerson (1982, p. 220), "A leaf, a drop, a crystal, a moment in time is related to the whole and partakes of the perfection of the whole."

Watson (1979) defines health as unity and harmony of the body, mind and soul and as a process of adapting, coping, and growing that continues from conception to death. Health includes: (1) a high level of overall physical, mental and social functioning; (2) an adaptive-maintenance level of daily functioning; and (3) the absence of illness, or efforts leading toward ameliorating illness.

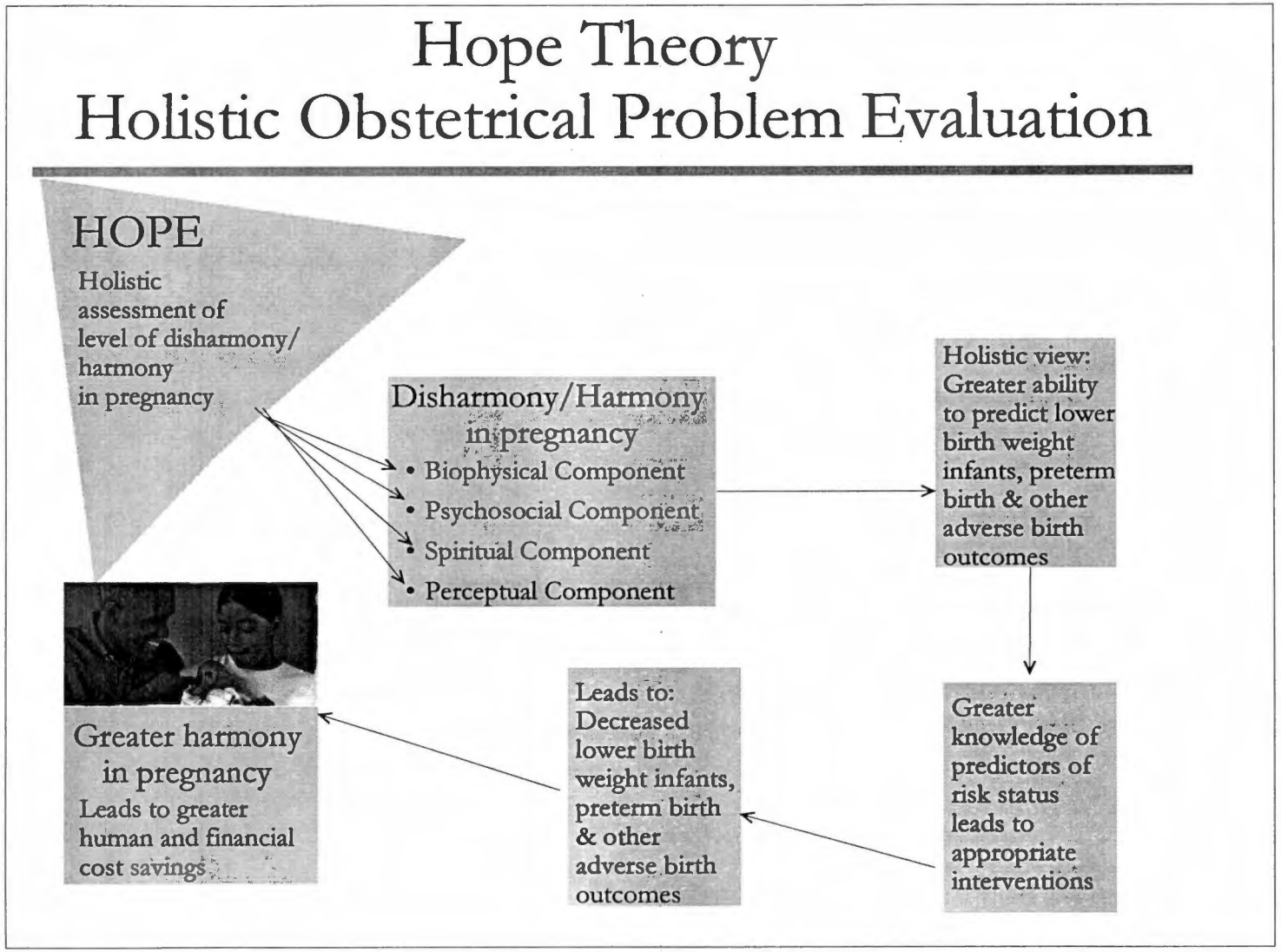

Hope Theory
Holistic Obstetrical Problem Evaluation
HOPE
Holistic assessment of level of disharmony/ harmony in pregnancy
Disharmony/Harmony in pregnancy
• Biophysical Component
• Psychosocial Component
• Spiritual Component
• Perceptual Component
Holistic view: Greater ability to predict lower birth weight infants, preterm birth & other adverse birth outcomes
Greater knowledge of predictors of risk status leads to appropriate interventions
Leads to: Decreased lower birth weight infants, preterm birth & other adverse birth outcomes
Greater harmony in pregnancy
Leads to greater human and financial cost savings

Figure 1

Watson described illness as the subjective turmoil or disharmony within a person's inner self or soul, or disharmony within the spheres of mind, body and soul that can lead to disease. Health and illness simultaneously stabilize and balance one's life.

The Body: Biophysical Component

Biophysical factors were not emphasized in Watson's theory (1979, 1985). Instead Watson referred readers to other texts for information on biophysical aspects of nursing care. Biophysical factors such as illness, diagnosis, disease treatment and surgery, while important, are described as a more dominate focus in our health care delivery system than an interest in psychosocial or socio-demographic factors. Watson ranks biophysical and psychophysical needs lower on a pyramid than psychosocial, interpersonal relationships and self actualization needs. While in Watson the biophysical component is described from a human needs perspective, this study described the biophysical component from a holistic assessment perspective that may lead to holistic interventions. Although Watson did not emphasize socio-demographic factors, she described a complex interrelationship among physiologic functions, psychological states, environmental and lifestyle factors.

The Mind: Psychosocial Component

The mind, or psychosocial component, is described as the person's emotional state. While Watson emphasized caring interventions for psychosocial needs, this study emphasized the relationship of the psychosocial component to low birth weight and other adverse pregnancy outcomes. Factors within the psychosocial component in the HOPE theory were drawn from Watson (1979) and included factors that may be related to low

birth weight and other adverse pregnancy outcomes such as the pregnant woman's level of stress, partner and other social support, self-esteem, depression, life style behaviors and abuse.

Watson defines stress as anything that interrupts a particular plan, sequence, lifestyle or pattern of behavior. Three characteristics of stress she described are: 1) magnitude of perceived stress; 2) level of chronic daily hassles; and 3) level of support in the environment. Stress is magnified according to the person's appraisal of the significance of the interruption or change. Change causes various levels of stress according to the meaning the person gives to the event. It is necessary to obtain the patient's appraisal of the effect of the stress-change in order for the nurse to develop a more realistic perception of the situation to help her cope. Clinical evidence cited by Watson supports her proposition that greater life changes associated with stress increased the likelihood of a disease onset. On a larger scale, populations at risk for greater stress will experience more disease. The magnitude of life change and the seriousness of illness experienced are described by Watson and affect prognosis of patients with long term illness. The prognosis would be more accurate if the provider accounted for the ability of the patient to adapt to social stresses (Watson, 1979).

The second kind of stressful input described by Watson (1979) was the level of chronic daily hassles. Hassles may include dealing with troubled children, unresolved developmental conflict, hostile interpersonal relationships at work or home, difficulty in marital and family relationships and financial worries. The third kind of stress affecting health and illness is described as the level of support and the milieu of the person's

environment. A milieu is defined as a system of stimuli that influence the people in their environments.

Studies were cited by Watson (1979), wherein the long term medical prognosis was more accurate when the health professional took into account the patient's psychosocial factors such as social stresses, coping ability and situational support. Watson (1979) describes studies wherein increased emotional and social support led to: decreased hospital stays; increased rates of healing and rehabilitation; increased coping ability; impulse control, confidence, extroversion; and decreased anxiety. A person's lifestyle behaviors, personality and environment are further described as a more frequent source of stress and illness than are biological or bacterial causes that in the past, health care providers did not acknowledge the effect that these lifestyle factors and behaviors had on health status. Watson suggests that correction of this neglect may diminish the frequency and severity of illness generally (Watson, 1979, 1985).

Watson defines depression broadly as sad facies, tearfulness, a feeling of being down, disgusted, fed up, discouraged or blue and believing there is no future. Depression, anxiety, unhappiness and tension were described as leading to physical disease by lowering the body's resistance, and leading to more negative lifestyle behaviors such as smoking, drinking and overeating. Watson suggests that nurses should evaluate the effect these psychosocial factors have on health outcomes. In addition, Watson advocates for caring interventions, derived from the holistic assessments, that promote health and high level wellness (Watson, 1979).

The Soul-Spiritual Component

The Holistic Obstetrical Problem Evaluation theory, inspired by Watson, includes the spiritual component. The spiritual component of the HOPE theory is the value the pregnant woman places on feeling close to God or a higher power in prayer; talking with family and friends about spiritual matters; reading spiritual related materials; practicing prayer or meditation; believing in the value of forgiveness; seeking the meaning of life, and valuing religion and wanting to attend or actually attending religious services.

Spirituality, defined by Watson, is an "honoring or a sense of presence higher and deeper than human. It is an awareness of an inner connection of this higher presence, a sense of connectedness, and transcendence; spirituality can be inclusive of one's religious faith" (Watson, 1997, personal communication). The concept of soul is defined as the geist, spirit, inner self, or essence of the person, which is tied to a greater sense of their own self-awareness, higher consciousness, inner strength and transcendent power. The soul is considered the most powerful force in human existence.

Holistic caring, described by Watson, values spirituality as an important part of a person's needs and concerns. Watson (1979) describes spiritual and religious awareness as a nurse's responsibility. Appreciation and respect for a person's spirituality (regardless of belief) can be a comfort to the individual. Watson believes that nursing science will benefit by emphasizing the value of spiritual aspects linked with human care. Based on this author's clinical experience as a midwife, it was noted that clients having a spiritual base, from a variety of faiths and belief systems, had better birth outcomes. Though not

formally tested, this clinical experience was instrumental in the development of this theory.

The Self: Perceptual Component

Watson supports additional scientific knowledge, practice and research efforts to explore the effects that personal views have on health. Watson (1979) states that healing power of belief should never be overlooked; medicine and nursing must focus on the individual's view of his or her health to improve health outcomes. Watson queries whether health or illness is an objective state defined by medicine and society, or a subjective state that exists in the mind and body of the person, concluding that an individual person has more control over his or her own health and illness than traditionally assumed (Watson, 1979). While Watson's theory does not specifically emphasize the person's perception of self, the significance of respecting and including the woman's view of pregnancy is upheld. This study explored the relationship of a woman's feelings toward her own pregnancy ranging from happiness to unhappiness, acceptance or denial and level of optimism toward the birth outcome.

Summary

Key concepts from Watson's theory provided the structure for developing the HOPE theory to predict risk in pregnancy. Watson describes mind-body-soul as a unity within her evolving and emergent world view. She does this to make explicit the spirit and/or spiritual, which she believes remains silent in thesis and other models. This research is in accord with Watson's theory generally, yet the most meaningful aspect of Watson's theory for this study is the proposition that harmony of body, mind and soul

leads to the highest form of health. The emphasis on harmony or disharmony leading to health or illness is supportive of research that examines maternal and perinatal health outcomes.

Propositions in the theory of HOPE:

Holistic Obstetrical Problem Evaluation

Watson's theory describing caring, holism and harmony within the spheres of mind, body, and soul provided the rationale for the Holistic Problem Evaluation (HOPE) theory that explored the relationship of body, mind, and soul to birth weight, gestational age and other adverse pregnancy outcomes. Propositions in the HOPE theory include:

1. When the Holistic Obstetrical Problem Evaluation (HOPE) theory assesses pregnant women holistically and includes the woman in this process,
2. And when viewing pregnant women holistically more accurately recognizes disharmony and more complex patterns of risk in pregnancy than viewing women from a purely biophysical perspective,
3. And when harmony is associated with low risk pregnancy and positive pregnancy outcomes (ie. adequate infant birth weight, full term baby), and disharmony is associated with higher risk pregnancy and more adverse pregnancy outcomes (ie. lower infant birth weight, preterm birth),
4. Then a Holistic Obstetrical Problem Evaluation (HOPE) approach to perinatal maternal health will more accurately measure evolving patterns of risk (disharmony) that could lead to low birth weight and other adverse

pregnancy outcomes, than a majority biophysical approach to perinatal and maternal health.

5. More accurate measures of risk status could enable appropriate interventions in the future and lead to improved birth outcomes.

Purpose

The purpose of this study was to test the Holistic Obstetrical Problem Evaluation (HOPE) theory by examining the relationship of socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components to low birth weight and other adverse pregnancy outcomes. The primary aim was to test the Holistic Obstetrical Problem Evaluation (HOPE) theory for prediction of maternal and perinatal health outcomes. The broad goal of this project was to discover a more precise and predictive risk profile of pregnant women that could lead to instrument development and interventions aimed at reducing low birth weight and other adverse pregnancy outcomes such as preterm birth. A unique aspect of this study was the examination of the relationship of spiritual factors to outcomes of pregnancy.

Theoretical Definitions

The following theoretical definitions for the Holistic Obstetrical Problem Evaluation (HOPE) theory were derived from Watson (1979).

Holism--The body, mind and soul are interrelated within the whole and the whole is greater than the sum of these (Watson, 1979).

Harmony--A unity of the pregnant woman's body, mind, soul; a process of adapting, coping and growing that results in perinatal health, infants and positive birth outcomes.

Disharmony --A subjective turmoil within a pregnant woman's inner self or soul or lack of harmony within the spheres of body, mind, and soul that can lead to evolving patterns of risk in pregnancy.

Pregnancy outcomes--Maternal and perinatal manifestation harmony or disharmony (low or high risk) of the pregnant client including birth weight, gestational age, preterm birth, APGAR score and unplanned cesarean section.

Socio-demographic factors--Of the environment: Environmental and social conditions that form a complex relationship with the woman's physiologic functions and psychological state such as partner status, health insurance coverage, barriers to access to prenatal care and race.

Biophysical component--Of the body and primarily physiologically based antepartum factors such as weighing less than 100 pounds, previous history of a premature or LBW baby, or frequent urinary tract infections.

Psychosocial component--Of the mind and the pregnant woman's emotional state including levels of stress, social support, self-esteem, depression, lifestyle risk behaviors and physical abuse.

Spiritual Component--Of the soul, an "honoring of a sense of presence higher and deeper than human" (Watson personal communication, 1997). It is an awareness of the pregnant woman's inner connection of this higher presence and a sense of connectedness

and transcendence. Spirituality can be inclusive of the pregnant woman's religious faith and practices (Watson, personal communication, 1997).

Perceptual Component--Of the self: A woman's own view of her pregnancy (rather than others' views) including the level of happiness, wantedness and acceptance of the current pregnancy and positive expectations for a normal birth.

Research Questions

The research questions to be examined were:

1. What is the relationship of socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components in mid-pregnancy with birth weight?
2. What is the relationship of socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components in mid-pregnancy with gestational age?
3. What is the relationship of socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components in mid-pregnancy with APGAR score?
4. What is the relationship of socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components in mid-pregnancy with unplanned cesarean birth?

CHAPTER TWO

REVIEW OF THE LITERATURE

The purpose of this study was to test the Holistic Obstetrical Problem Evaluation (HOPE) theory by examining the relationship of socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components to low birth weight and other adverse pregnancy outcomes. The review of the literature begins with a background and description of perinatal risk assessment. This is followed by a discussion of socio-demographic factors, biophysical, psychosocial, and spiritual components and the woman's perception of her pregnancy that are related to low birth weight and other adverse pregnancy outcomes.

Risk Assessment Screening- Development and Description

Early efforts to measure the cumulative effect of single and multiple factors associated with poor pregnancy outcomes have grown within the last 15-20 years (Selwyn, 1990; Wall, 1988). Medicine developed risk assessment in the late 1960's to formalize and aid obstetricians to help predict a client's chances for complications later. Risk assessment had a biologic focus and an epidemiologic approach that validated the sensitivity and specificity of the developing risk instruments. The factors from risk instruments are traditionally included in the history form of all prenatal records. Instruments with greater sensitivity, finding women at risk for poor outcomes, are used more often (Hobel, 1982).

Midwives, family physicians and nurse practitioners use risk assessment criteria to help with decision making regarding levels of the client's risk status and need for referral to specialty care. Based on the client's risk status and birth setting, midwives may "risk out" a client, keep a client in their care, or co-manage care with a family physician, obstetrician or perinatologist. Standardized risk assessment enhanced the clinician's ability to predict the likelihood of poor perinatal maternal outcomes by measuring the impact of cumulative synergistic effects of risk, such as the impact of single adolescent motherhood, smoking and history of preterm birth (Institute of Medicine, 1985; Selwyn, 1990; Wall, 1988; Wall, Sinclair, Clark, Nelson, & Toffler, 1989).

Risk systems traditionally had a biophysical emphasis that excluded psychosocial or spiritual factors and initially did not include lifestyle risk factors such as smoking and use of drugs or alcohol. Physiological variables chosen for inclusion were primarily derived from investigator opinion, and/or ease of access, (e.g., information from the patient's chart) and medical rather than the nursing or psychological literature . The source of variables for risk assessment tools and larger multivariate studies were often derived from small or univariate studies, such as the relationship of smoking with infant mortality and low birth weight (Hebel, Nowicki, & Sexton, 1985), the relationship of income or race to birth outcomes (Hogue & Hargraves, 1993), and the association of prenatal abuse with low birth weight (Bullock & McFarlane, 1989).

Unfortunately, despite the positive benefits of risk screening to prevent infant mortality and low birth weight, the literature revealed many methodological and conceptual problems that make traditional risk screening usefulness and interpretation

both controversial and difficult (Institute of Medicine, 1985; Selwyn, 1990; Wall, 1988). While important strides have been made, a review of these risk assessment systems revealed that these systems have methodological flaws and differ in kind of emphasis, level of complexity, focus of measurement, weighting of variables, and type of scoring. Many of these instruments have low predictive ability to determine risk. Current risk assessment tools can predict poor pregnancy outcome 40%-60% of the time (Ernst, Michielutte, Meis, Moore & Sharp, 1988; Wall 1988).

Providers often use technological predictors and interventions because risk factors have already been identified, rather than including them as a routine screen to improve birth outcomes. Therefore, while the relationship of technical advances, such as prenatal biophysical profile, ultrasound (U/S), fetal movement counting (FMC), Alpha-Fetal Protein (AFP) screening, Chorionic Villi Sampling (CVS), amniocentesis, and fetal fibronectin testing (Morrison, 1997) have contributed widely to positively predicting birth outcomes, these technological predictors were not addressed in the present study.

Description of Risk Assessment Systems and Instruments

The Institute of Medicine's (1985) evaluation of 13 risk assessment systems and Selwyn's (1990) evaluation of 60 risk assessment systems revealed that most risk assessment systems only contain data about the client's demographic characteristics, past pregnancies, and medical history. On the other hand, the classic Popras--III System, based on Hobel, Youkeles, & Forsythe's (1979) tool, is more comprehensive and contains a number of socio-demographic, psychosocial, behavioral and nutritional variables. However, Hobel et al's (1979) scoring instrument has a single limited category

labeled psychosocial. When three classic risk scoring systems were compared, Goodwin's system selected 27% of the high risk patients as compared to Hobel's 51% and Halliday's 54% identification of high risk prenatal patients (Kelly, Acheson, & Zyzanski, 1988). Gaining higher sensitivity of the instrument may compromise the specificity, resulting in costly and unnecessary interventions.

The often cited Oregon Health Sciences University's obstetric risk scoring system (Wall, 1988) is a physiologically based tool developed from the scales of Hobel (Hobel, Hyuarinen, & Okada, 1973; Hobel, Youkeles, & Forsythe, 1979) and Goodwin (Goodwin, Dunne, & Thomas, 1969). Wall found a positive correlation between initial risk score and maternal length of stay in the hospital and maternal hospital charges. Sensitivity and positive predictive abilities were both low, whereas specificity of the tool was reasonably high.

Studies attempting to identify women at risk for preterm babies have found risk factors such as a previous history of a preterm birth or low birth weight baby, spontaneous abortion, single adolescent status, and smoking (Ernst et al, 1988; Freda, Anderson, Dumas, Poust, Brustman, & Merkatz, 1990) have the strongest relationships to birth outcomes. Yet risk assessment for prevention of preterm birth, while important, has met with mixed results and effectiveness (Meis, Ernst, Moore, Michielutte, Sharp & Bueschen, 1987; Papiernek, Bouyer, & Dreyfus, 1985). Some studies have classified women as high risk and found a high relationship of this risk score to actual preterm birth, while others have not. For example, Creasy, Gummer & Liggens (1980) classic scoring system to predict preterm delivery has a 30% positive predictive value and a 64%

sensitivity rate.

Few risk assessment approaches included risk factors that are modifiable or preventable, such as lifestyle factors. Instead most approaches concentrate on demographic and biophysical risk factors that are not modifiable, such as race, previous history, education or age. Yet, twenty-five percent of preterm births are attributed to non-medical factors, such as smoking, and the reason for two-thirds of preterm deliveries are unexplainable (Alexander & Korenbrot, 1995; McGregor et al, 1990). In addition, few instruments assess relationship of risk to maternal/perinatal outcome using multivariate, reliable, and valid instruments that emphasize the composite and cumulative effect of biophysical factors, psychosocial and lifestyle factors. No instruments or assessments were found that included spiritual factors and birth outcomes (Herrera, Salmeron & Hurtado, 1997; Hobel, 1979, 1982; Institute of Medicine, 1985; Mawn & Bradley, 1993; Oakley, 1992; Sokol, Rosen, Stojkov, & Chik, 1977; Wall, Sinclair, Nelson & Toffler, 1989).

A holistic approach to risk screening should include biopsychosocial and spiritual aspects. Few, if any, holistic approaches were found that either described their research process or produced valid and reliable results. Grimes, Mehl, McRae, and Peterson (1983), considered leaders in the area of holistic approaches to prenatal care, conducted a qualitative phenomenological study that identified contributing factors to risk of pregnancy. From that study an instrument was developed to include psychological, psychosocial and spiritual factors not addressed in traditional obstetrical risk screening; however, the tool was not formerly tested. Although the researchers stated

that a phenomenological, holistic approach more accurately measured risk than medical models, their methods were not described. The authors stated "unfortunately, through limitations of time and space and our own knowledge we have not operationalized the procedures so that others can use our method" (p. 29).

Harlan (1985) developed a Holistic Prenatal Surety Risk Screening Tool, combining an adaptation of Mehl's (1981) assessment, a Health Locus of Control scale, a life stress score, and a physiologic screen adapted from the Tennessee Department of Health (Hoover-Dempsey & Simpkins, 1982). The form was lengthy, with each section requiring a complex scoring system. In addition, the poor layout and design detracted from ease in use. Harlan never published or tested this instrument.

Armetta and Jesse (1987) developed an unpublished Maternity Care Coding Form (MCCF), with a biophysical emphasis, to measure pregnancy outcomes with midwifery clients in out-of-hospital settings. Armetta (1989) tested the MCCF, finding that total antepartal risk scores were related to total birth outcome scores (combined neonatal and post partum problems), with fairly high sensitivity (predicted high risk outcome score with high maternal antepartum scores 76.5 percent of the time). However the specificity was lower, predicting low risk outcome score 38.7 percent of the time. There was no significant relation of antepartum risk score to birth weight or APGAR score. The scoring on this form was complex, the birth outcomes were combined and it was not tested for reliability and validity prior to use. Because the Maternity Care Coding Form did not include biopsychosocial and spiritual variables, Jesse (1988) developed the Holistic Antepartal Risk Assessment (HARA) for inclusion in the Maternity Care Coding

Form, to determine if HARA could more accurately predict adverse outcomes for both baby and mother. This instrument was not published or tested.

Other nurse researchers have developed risk assessment systems that also went untested. Sherwen and Mele (1986) described their holistic risk assessment in pregnancy based on Roy's Adaptation Model, yet no formalized testing or use of the assessment was explored. In Kalb's (1990) study of women at risk for preterm labor, guided by Margaret Newman's theory of pattern, pregnant women learned to recognize their symptoms of preterm labor as part of the explicate pattern of the whole. The nurse assisted them with recognition of this pattern. Unfortunately, Kalb described the process in practice without citing measurements or findings. Wolff and Hunt (1991) described a Holistic Caring Process, a synthesis of nursing process, holism and caring. From that work, they developed a Holistic Nurse Access tool to predict high risk pregnancy. Their instrument was not tested for reliability or validity, nor were results reported. Only two reliable and valid instruments developed by nurses to measure psychosocial risk in pregnancy were found in the nursing literature (Curry, Campbell & Christian, 1994; Norbeck, Lindsey & Carrieri, 1981).

Socio-demographic Factors

Socio-demographic factors such as African-American race (Paneth, 1995), low income, barriers to access to prenatal care (Hogue & Hargraves,1993); unpartnered status at either age extreme, teenage pregnancy and lack of education have been shown to have a negative influence on birth outcomes (Institute of Medicine, 1985). One hundred years ago African-American babies were twice as likely to die as white babies and this is true

today.The question remains, why the rate of infant low birth weight among African-American women continues after adjusting for biophysical, behavioral, psychosocial, economic and intervention factors (Hogue & Hargraves, 1993; Hughes & Simpson, 1995). Twenty one percent of African-Americans did not have health insurance in 1995 and African-American women receive less prenatal care than Caucasian women. (United States Bureau of the Census, 1996). Braveman, Egerter, Edmonston & Verdon's (1995) study (N = 217,416) revealed that African-American women experience increased rates of cesarean section delivery. African-American women were 24% more likely to undergo a primary cesarean section than were whites although cesarean delivery rates are lowest with Medicaid populations generally and highest among patients with private fee for service coverage.

Poverty

Poverty increases the risk of low birth weight, intrauterine growth retarded (IUGR) babies and infant mortality (Goldenberg, Patterson & Freese, 1992; Hogue & Hargraves, 1993; Institute of Medicine, 1985). Women in poverty also have factors related to these birth outcomes such as lower levels of education, work in low-wage jobs, fewer social resources, lack of health insurance, and barriers to prenatal care (Goldenberg, Patterson & Freese, 1992; Hogue & Hargraves, 1993; Hughes & Simpson, 1995).

Lack of nutritious food, often associated with poverty, appears to have only modest effects on birth weight in the United States. Pagel et al (1995) found no relationship between pre-pregnant weight and weight gain during pregnancy and infant

birth weight. While a weight gain of <15 pounds during pregnancy and a weight of less than 100 pounds was associated with LBW, and lifestyle factors showed a consistently strong association with LBW. Poor women often have lifestyle behaviors, such as smoking, that are associated with low birth weight more often than women with higher incomes (Paneth, 1995).

Barriers to Care

Barriers to prenatal care have been classified as internal and external. Internal barriers to prenatal care include psychological factors, such as fear or denial of the pregnancy, lack of awareness of the need for prenatal care, negative attitudes toward health care providers, family problems or cultural beliefs (Goldenberg, Patterson & Freese, 1993). External barriers are often out of the woman's control and include difficulty getting into the system of prenatal care because of lack of finances, no health insurance or child care, transportation difficulties, problems finding a provider who accepts Medicaid (TennCare in Tennessee), meet with unfriendly systems or racism (Goldenberg, Patterson & Freese, 1993; Hogue & Hargraves, 1993; Melnikow, Alemagno, Rottman, & Zyanski, 1991). Barriers affect prenatal care enrollment. Mothers who do not have health insurance do not seek prenatal care as often as women who have insurance. Although barriers to care can affect birth outcomes, most risk assessment systems do not inquire about barriers to receiving prenatal care. Providence Health System's risk form in Portland Oregon (Crisiwell, personal communication, 1996) is an example of a system that inquired about barriers to care and also incorporated aspects of the psychosocial variables from the Prenatal Psychosocial Profile into their prenatal

forms to gain greater understanding of risk in pregnancy. So far, 4000 women have been screened to determine risk status and level of intensity of care. Women who were found to need greater intensity of care were referred to a case manager. Providence Health System is now researching whether case management programs reduce interpartum hospital stays and costs (Curry, 1998, personal communication). Information about barriers to care will be included in this study. .

Prenatal Care

Experts do not agree on the effectiveness of prenatal care to reduce poor pregnancy outcomes. Fiscella's (1995) critical review of the effectiveness of prenatal care concluded that prenatal care in the United States does not have a positive impact on low birth weight. However this review only included studies comparing adequate with inadequate prenatal care, rather than including studies comparing little to no prenatal care to some prenatal care. Women who received late or no prenatal care have an increased risk of poor pregnancy outcomes (Eisner et al, 1979; Sokol, Rosen, Stojkov, & Chik, 1979).

The relative risk of low birth weight and perinatal mortality is more than doubled or tripled for women who receive little or no prenatal care. Eisner et al (1979) found that women who received no prenatal care were five times more likely to deliver an infant weighing less than 2500 gms than a woman who had received some prenatal care. Melnikow et al (1991) (n = 120) revealed that women who had less than three prenatal visits had a lower mean birth weight (2816 gm) than women (n = 120) who had three or more prenatal visits (3164 gm) and woman with less than three prenatal visits also had

five times the rate of prematurity (<36 weeks). Twenty-five women in this sample delivered before 36 weeks in the group that received two or fewer prenatal visits, compared to five women in the group that received three or more prenatal visits. In addition, a profile of women with minimal or no prenatal care in this study included higher parity, drug and tobacco abuse, low educational levels and a higher rate of delivering lower birth weight babies.

Partner Status, Age, Education and Parity

Unmarried or unpartnered women consistently deliver a higher percentage of low birth weight babies than those who are partnered or married. The significance of this factor becomes more of an issue when viewing the high number of unmarried women bearing children (Institute of Medicine, 1985). In 1994, 29% of Tennessee's families with children were headed by a single parent compared to 26% nationally (Kids Count Data Book, 1997). Often unmarried mothers are adolescents. Women under 18 years (and over 35 years) have higher rates of LBW in the United States (Institute of Medicine, 1985). Many teen mothers have profiles that increase the likelihood of low birth weight babies, such as low income and unpartnered status and African-American racial ethnicity. In addition, teens are usually less educated, less likely to begin early prenatal care, weigh less and are shorter than older pregnant women (Institute of Medicine, 1985). The high rate of teen birth in Tennessee (43/1000) compared to the national rate (38/1000) placed Tennessee among the seven states in the nation with the highest rate of teen pregnancy in 1994 (Kids Count Data Book, 1997). Multiparous women in general deliver infants of slightly earlier gestational age and somewhat lower APGAR score, yet

nulliparous women more often have a cesarean birth (Pagel et al, 1990).

The Body: Biophysical Component

Biophysical risk assessment is a common and valued part of a woman's prenatal history at her initial visit (Institute of Medicine, 1985). The design of traditional biophysical risk assessment instruments begins with decisions about biophysical factors relevant to poor maternal and perinatal outcomes based on the literature or the experience of the one designing the instrument. For example, a history of prior preterm birth is often included in biophysical risk assessment because it is the single best predictor of both preterm labor and preterm birth.

Preterm babies are 28 times more likely to die within the first month of life that term babies (37-41 weeks) (USDHHS, 1997). Preterm birth is the principle cause of low birth weight in developing countries (Center for the Future of Children, 1995). In addition, various genital tract infections (chlamydia, bacterial vaginosis, group B strep) have also been linked to preterm delivery and low birth weight (Goldenberg & Andrews, 1996). Other authors argue that these studies are not conclusive (Chomitz, Cheung & Lieberman, 1995; McGregor et al, 1990).

Ernst et al (1988) (n = 11,623) discovered biophysical and medical history factors that had the strongest relationship to low birth weight and preterm birth (P-LBW). These were: Less than one year since the last birth, premature delivery or birth less than 2,500 grams, two or more stillbirths or neonatal deaths, uterine anomaly, DES exposure, and a history of placenta previa. While this model improved the ability to identify women at risk for a P-LBW baby, it still was unable to detect half of the resulting P-LBW

deliveries. The authors concluded that further research was needed to improve the ability to predict this high risk group. Other predominant medical factors that increase the likelihood of low birth weight and preterm labor include intrauterine growth retardation (IUGR), first pregnancy, short stature, low pre-pregnancy weight, history of spontaneous abortions, medical complications and frequent urinary tract infections during pregnancy (Ernst et al 1988).

The Mind: Psychosocial Component

Numerous prospective and retrospective studies have examined the relationship of psychosocial risk factors to outcomes of pregnancy. Psychosocial risk factors such as stress (Cooper et al, 1996); decreased social support (Norbeck, DeJoseph & Smith, 1996); self esteem (Harvey, 1991); depression (Webster, 1994); lifestyle factors (Chomitz, Cheung, Lieberman, 1995); and abuse (McFarlane, Parker, Soeken, 1996) have been found to affect birth weight, gestational age and APGAR score; however they seldom are included within risk assessment. Curry, Campbell & Christian (1994) tested the Prenatal Psychosocial Profile (PPP) and found that stress was negatively correlated with level of satisfaction with support from partner, support from others, and self esteem. High stress, low self esteem, and depression often lead to lifestyle behaviors, such as substance abuse, that are harmful in pregnancy (Copper et al, 1996). There is also an association between physical abuse during pregnancy, increased substance use and low birth weight (Parker, McFarlane & Soeken, 1994).

Stress

Maternal life stress has been associated with adverse neonatal outcomes both directly and indirectly. The majority of research points to a positive association between higher stress levels and adverse pregnancy outcome (Copper et al, 1996; Lobel et al, 1992; Newton & Hunt 1984; Norbeck & Tilden,1983; Wadwha, Sandman, Porto, Dunkel-Schetter & Garite, 1993). Norbeck and Tilden's (1983) and Nuckolls, Cassel, & Kaplan's (1972) classic studies were influential in the development of research regarding the relationship of stress and social support to pregnancy outcomes. Studies on stress are often linked with social support. Norbeck and Tilden's (1983) theoretically based study of medically healthy pregnant women (N = 117) linked high life stress and low social support to gestational age and newborn complications. They found that maternal disabling difficulties were positively related to infant complications. Pregnant women with high levels of perceived stress and low levels of support had the highest rate of labor and delivery complications. The interactional effect accounted for 9.1% of the variance in newborn outcomes. Neither of these studies controlled for smoking and drinking, or separated out specific newborn complications. Instead multiple birth outcomes were clumped into a general category, normal and abnormal birth outcomes.

Several recent studies reported a significant relationship between prenatal stress and birth outcomes (Copper, et al, 1996; Pagel et al, 1990; Schmitz & Reif, 1994; Wadhwa, et al, 1993). Schmitz & Reif (1994) reported a significant relationship between psychosocial high risk score (financial status, family stressors, coping attachment and environmental health) and neonatal APGAR score @ five minutes. However, this small

study (N = 41) lacked investigator control and used untested psychometric instruments. Pagel et al's (1990) study (N = 100) used a prospective design and controlled analysis to find that increasing life events before pregnancy were significantly associated with lower infant birth weight after controlling for biomedical and psychosocial variables. In Copper et al's (1996) large study (N = 2593) using tested instruments, high stress was significantly associated with both spontaneous preterm birth and LBW after adjusting for maternal demographic and biophysical characteristics. Nordentoft, et al (1996) (N = 2432) also found that delivery before the end of 37 weeks gestation occurred significantly more often for each one point increase in psychosocial stress as measured by the Psychosocial Stressor Scale (American Psychiatric Association,1987)

Stress can effect pregnancy directly and/or indirectly (Ivstan, 1986; Ogrocki, 1994). The direct effect of stress and anxiety is physiological, with increased levels of anxiety in labor affecting plasma catecholamine and cortisol levels, which in turn affect uterine activity to produce longer labors (Lederman, Lederman, Work, & McCann, 1979). A biopsychosocial model of maternal neuroendocrine responses to the stress affecting fetal physiologic characteristics and pregnancy outcomes has been supported (Wadhwa et al, 1993). Anxiety and stress may alter body chemistry and the physiological process of birth, resulting in reduced blood flow and oxygen to the placenta and uterus, resulting in what midwives have coined "a white uterus." Decreased blood flow to the uterus reduces its ability to contract effectively resulting in longer labors, and less oxygen profusion to the fetus, which increases the likelihood of fetal distress, contributes to poor fetal growth, and possible increased liklehood of a cesarean birth (Lobel, Dunkel-

Schetter, & Scrimshaw, 1992; Simpkin, 1986; Wadhwa et al, 1993).

The indirect effect of stress may include destructive lifestyle behaviors and health habits perceived as soothing and as a way to cope with psychological stressors. These harmful lifestyle habits often include smoking and alcohol or drug abuse, rather than more positive health habits such as exercise or eating well (Copper et al, 1996; Lia-Hoagberg et al, 1990; Rutter & Quine, 1990).

Social Support

Social support acts as a buffer to stressors in pregnancy and has been linked to birth weight (Norbeck & Anderson, 1989; Norbeck, DeJoseph & Smith, 1996; Rothberg & Lits, 1991). Nuckolls' (1972) study of Army wives was one of the first to reveal social support had a stress-buffering effect in pregnancy. Norbeck and Tilden (1983) furthered this work in the general population, controlling for biophysical risk factors and using standardized but lengthy psychosocial instruments. Subjects with high stress and low social support were found to have the highest rates of labor and delivery complications. Social support acted as a buffer for high stress. Further research validated these findings (Norbeck & Anderson, 1989; Norbeck, DeJoseph & Smith, 1996). Norbeck and Anderson (1989) reported that social support provided by key people is related to pregnancy outcomes. Level of support from spouse and partner was the highest predictor of labor complications accounting for 19.5% of the variance for total pregnancy outcomes and 9.1% of the variance for gestational age. Level of support by the woman's mother was the next best significant predictor of all labor related complications. Higher level of support from friends was associated with higher rates of labor complications,

having a reverse effect of that expected. The authors also reported that because of the high incidence of infant mortality and low birth weight among African-American women, the value of social support as an intervention for African-American women lacking a partner or mother support could have a significant effect on reducing infant mortality and low birth weight. This finding was confirmed in their follow up study on social support.

Norbeck, DeJoseph, & Smith's (1996) study of African American pregnant women (N = 319) identified 114 subjects with low social support from male partner or mother. The women without social support were randomly assigned to a social support intervention group with their male partner/mother or a control group without a support intervention. The rate of LBW was 9.1% in the social support intervention group compared to 22.4% in the control group without the social support intervention, revealing the social support intervention was effective in reducing LBW. Increasing levels of family social support also have been associated with higher APGAR scores at 1 and 5 minutes (Pagel et al, 1990). A recent ground breaking study by Herrera, Salmerson & Hurtado (1997) assessed biopsychosocial risks, finding these more predictive of LBW than examining biophysical factors alone. The weakness of this study was limiting psychosocial variables to anxiety, depressed mood and family support, and the validity and reliability of the tool (Hamilton, 1959) to measure anxiety and depression was not described.

Early studies on stress and support often failed to control for socio-demographic, biophysical risk factors and other intervening behaviors, used standardized instruments

that were often lengthy and complex to use, and rarely included information on abuse. Additional flaws were that the subjects were usually drawn from middle class samples; outcome measures were not defined well, and methodological problems such as retrospective designs and lack of control for biophysical and demographic factors (smoking, drinking) on birth outcomes before evaluating the influence of psychosocial factors (Istvan, 1986; Norbeck & Tilden, 1983).

Self Esteem & Depression

Few studies were found that focused on the relationship of self esteem with birth outcomes. More often studies cite the indirect relationship of self esteem with birth weight through lifestyle behaviors. Copper et al (1996) reported that women with poor psychosocial well being as measured by stress, depression, and low self esteem had more maladaptive health behaviors, such as smoking and use of drugs and alcohol. Harvey (1991) reported that women with high self-esteem were significantly more likely to obtain prenatal care and reported higher levels of social support than women with lower self esteem.

Depression has been associated with pregnancy complications and outcomes, such as gestational age, APGAR score, and length of labor (Adler & Hayes, 1990; Chalmers, 1983; Molfese, Bricker, Manion, Beadnell, Yapel & Moires, 1987). Webster (1994) found positive relationships between maternal depression, measured in the first and second half of the pregnancy, to lower newborn APGAR scores at five minutes. Steer, Scholl, Hediger, & Fischer (1992) reported that as depression scores on the Beck Depression Inventory increased, indicating higher levels of depression, the risk of LBW

and preterm labor increased. Stein, Campbell, McPherson & Cooper (1987) concluded that psychological state did not predict LBW and preterm labor. Herrara et al's (1992) study (N = 214) revealed that biomedical risk alone was not significantly related to perinatal complications whereas psychosocial predictors (emotional tension, anxiety, depressive humor, dissatisfaction with time, space and money share with family) were related. The weakness of this study was grouping nine perinatal complications together into one dependent variable (complication or not) rather than specifying birth outcomes. Additionally, the reliability and validity of the instruments was not described. Herrara et al (1997) later addressed this problem by specifying low birth weight as a pregnancy outcome, and again confirming that anxiety, depressed mood and family support were related to birth outcomes, specifically LBW. It is difficult to know whether high levels of anxiety and depression are caused by pregnancy complications, or whether anxiety and depression levels increase the existence of these pregnancy complications which lead to adverse birth outcomes (Norbeck & Tilden, 1983).

Lifestyle Behavior Risks

Maladaptive lifestyle behaviors such as smoking, and substance abuse during pregnancy are associated with higher frequency of LBW and prematurity. These behaviors are also more prevalent among pregnant women who are stressed. Numerous studies have shown that active smoking (>10 cigarettes a day) is related to intrauterine death after the first trimester, preterm birth, full term low birth weight babies, intrauterine growth retardation (IUGR), and low APGAR scores (Ahlborg & Bodin, 1991; Chomitz, Cheung, & Lieberman, 1995; Pagel, 1990; Windsor, Qing, Lowe,

Perkins, Ershoff, & Glynn, 1993). Like smoking, moderate and heavy alcohol consumption and/or illicit drug use in pregnancy is associated with poor pregnancy outcomes such as low APGAR scores, lower gestational age and low birth weight (Chomitz, Cheung & Lieberman, 1995; Copper et al, 1996; Institute of Medicine, 1985; Jack & Culpepper, 1991; Lia-Hoagberg, Knoll, Swaney, Carlson & Mullett, 1988; Pagel, 1990; Rutter & Quine, 1990) and abuse (Parker, McFarlane & Soeken, 1994).

The indirect effects of these destructive health behaviors, tend to cluster, such as polysubstance abuse associated with abuse in pregnancy, poor nutrition, poor weight gain, missed prenatal appointments, or sexually transmitted diseases. These behaviors can contribute to adverse birth outcomes, complicating the ability to examine the individual effects of these destructive behaviors (Chomitz, Cheung & Lieberman, 1995; McFarlane, Parker & Soeken, 1996). A highly stressed woman with little social support is unlikely to have the motivation, time, energy, and resources to practice a nutritious diet, rest, exercise, and otherwise plan positive prenatal care practices.

Abuse

Physical abuse in pregnancy is another psychosocial risk factor for low birth weight. Finding women who are abused varies depending on the kind of questions asked. Although questions on abuse are now included on a few prenatal history records, many do not include this issue. The question, "have you been abused," included on prenatal forms is commonly asked by providers although this is not as sensitive as specific questions asking "have you ever been pushed, slapped or physically hurt by someone." More specific questions result in more accurate responses (McFarlane, Parker, Soeken &

Bullock, 1992) leading to appropriate identification and interventions for these abused women.

In Parker, McFarlane & Soeken's (1994) prospective study (N = 1203), 24% of urban pregnant teens and adults receiving prenatal care in public clinics reported physical and sexual abuse within the last year. Although teens reported a significantly higher rate of abuse (28%) than adult pregnant women (23%), the adult abused women reported more severe physical and emotional abuse. Bullock and McFarlane (1989) reported that women who were physically abused before or during pregnancy delivered low birth weight babies 17.5% of the time, versus women who were not abused during or before pregnancy delivering low birth weight babies 4.2% of the time. The likelihood of women abused in pregnancy delivering a LBW baby was also reported (14.2% for abused and 8.6% for non-abused) in a prospective cohort analysis of 1,203 African American, Hispanic and Caucasian women (McFarlane, Parker & Soeken, 1996). Women abused in pregnancy delivered infants weighing 133 gms less than women who were not abused. Although African American and Caucasian women were equally abused (18% and 17%, respectively), Caucasian women experienced more frequent and severe episodes of abuse. Also, women who are abused may neglect chronic medical conditions that affect pregnancy outcomes (Chomitz, Cheung & Lieberman, 1995).

In summary, instead of a comprehensive approach, studies with a psychosocial focus were often separate from those with a biophysical focus even though each contributed to predicting low birth weight and adverse pregnancy outcomes, and few included information on domestic violence (Herrera, Salmerson & Hurtado, 1997).

Studies have not consistently controlled for the influence of socio-demographic, biomedical and lifestyle factors such as smoking and drinking when assessing the influence of psychosocial factors (Norbeck & Tilden, 1983; Pagel et al, 1990). While nursing has developed a body of knowledge about the importance of valuing psychosocial aspects of pregnancy and birth, few formalized nursing studies testing the relationship of psychosocial factors to birth outcomes have been reported (Copper et al, 1996; Curry, 1997; Norbeck & Anderson, 1989; Norbeck, DeJoseph & Smith, 1996; Schmitz & Reif, 1994).

The Soul: Spiritual Component

Although nursing has taken the lead in stressing the importance of providing spiritual care, the effect of spirituality on pregnancy has seldom been addressed. The past two decades have revealed nursing literature stressing the importance of providing spiritual care and indicating that spirituality is integral to the practice of holistic nursing (Loyer, 1995). As previously noted, Watson defines spirituality as an "honoring or a sense of presence higher and deeper than human. It is an awareness of an inner connection of this higher presence and a sense of connectedness and transcendence. Spirituality can be inclusive of one's religious faith" (Watson, personal communication, 1997). There are various and increasing emphases on gaining knowledge about spirituality in lay literature, as well as in nursing and medical science. Emphasis on the soul is returning to Western culture, as reflected in the more than 800 books exploring the meaning of soul, published since 1994. Thomas Moore's Care of the Soul, ran for 150 weeks on the New York Times best seller list (Woodward, 1997).

Research suggests that spiritual well being is a valuable resource that facilitates psychological well being, inspires hope and coping in times of illness or stress, helps individuals find meaning, and garners internal resources when faced with uncertainty (Carson, Soeken, & Grionnon, 1988; Landis, 1996; Post-White et al, 1995; Smucker, 1993). Studies examining the relationship between religion and /or spirituality and health have focused on heart disease, cancer and mental illness (Mullen, 1990); health risk behaviors, such as smoking, drinking and use of drugs (Lanig, 1994); stress and depression (Fehring, Brennan, & Kellen, 1987); hardiness (Carson & Green, 1992); prenatal care expectations (Morgan, 1996); and birth weight (Fonnebo, 1994).

Studies seem to be clustered in either the effect of religion, or denominational affilitation (eg. Catholic vs Seventh Day Adventist) as a demographic factor (often referred to as religiosity) or the effect of spirituality on health. Fewer studies examined the relationship of spirituality to health. Levin & Vanderpool's (1987) review of more than 250 articles examined epidemiological, sociomedical and biophysical investigations of the effect of a person's religion and denominational affiliation on health, but found no consistent trend. However the authors reported that few studies gave a primary focus to the health effects of religion. Rather, religion was included as a demographic factor and reported anecdotally. Studies that emphasized religiosity beyond a demographic factor revealed a positive relationship of religiosity to wellness and decreased religiosity with health compromising behaviors and illness (Oleckno & Blacconiere, 1991).

According to Levin & Vanderpool (1987) there are problems that need to be addressed when asking about religious attendance. The researchers suggest that answers

to frequency of religious attendance may be an indication of functional ability and transportation rather than an indicator of level of religiosity. Only asking about frequency of attendance can result in misleading conclusions, thus missing those who may not physically be able to attend. Few studies ask about desire to attend as well as actual attendance.

Fehring et al (1987) examined spirituality and health outcomes. This correlational study of freshman nursing students demonstrated a positive relationship between spiritual well being, existential well being, and spiritual outlook. In addition, spirituality showed a strong relationship with a negative mood; lower spirituality was related to increased frequency of a negative mood state. The study also confirmed the existence between increased stress responses and lower spirituality scores.

Few studies were found that investigated the role of religion and spirituality on birth weight and other adverse pregnancy outcomes. One study was found that specifically examined the effect of religion on birth weight (Fonnebo,1994) and no studies were found that examined the effect of spirituality on birth weight. Two studies, one qualitative and one quantitative, and a review of the literature on the effect of religion on birth outcomes were found that related spirituality and/or religion to maternal and perinatal expectations and pregnancy outcomes.

The goal of Morgan's (1996) qualitative, ethnonursing study (N = 33), guided by Leininger's Theory of Culture Care, discovered that culturally congruent prenatal care for African-American women included four themes: 1) cultural care included protection, presence and sharing; 2) women's social structure greatly influenced their health and

well being and included spirituality, kinship and economics; 3) distrust of noncaring professionals led to barriers to care; and 4) these women incorporated folk beliefs, practices and lay professional providers in their care. Key informants were pregnant African-American pregnant women and general informants were family members, friends, community leaders and health care professionals. The authors explored the values, beliefs and practices of African-American pregnant women that influenced them to use prenatal care services. In theme number two the women's social structure that affected their health and well being included spirituality. Key informants described that spirituality enabled African-American women "equanimity" (equilibrium). Both urban and rural pregnant key informants described spirituality as an essential element of life. Few, if any of the key informants were affiliated with any particular church and no particular denomination was preferred. Yet, much discussion centered on the belief in God, such as, "I trust in the Lord and everything will be all right." Morgan concludes that these findings should encourage nurses to "explore, understand, and accept spiritual beliefs and practices of African-American women" (p. 7). This knowledge could help health care professionals provide culturally sensitive prenatal care that incorporates spirituality to increase the health and well being of African-American clients.

Fonnebo (1994) studied the health effect of Seventh Day Adventist (SDA) religious practice by examining pregnancy outcomes as part of a larger study examining the association between SDA faith and the incidence of disease, cancer, and mortality. The sample of all Seventh Day Adventists (N = 7285) included 98% of all SDA's who were registered in Norway's national health registries. Birth weight of babies from SDA

mothers was significantly higher (99 g), birth length was 3mm longer and gestational age was identical to the matched control group. Relative risk for infant death in the SDA group from 28 weeks and longer was low (.87). However no comparison of infant death with the non SDA control group was described, nor was this matched control group described. The authors discuss that the magnitude of these differences (birth weight, length and gestational age) is similar to babies born to non-smoking and smoking pregnant women in the general population. The healthy diet practiced by Seventh Day Adventist combined with decreased lifestyle risk behaviors, such as smoking, and drinking were attributed as possible reasons for these differences in the SDA versus the control group. Non- pregnant SDA subjects in this study were also reported to have increased life expectancy, lower cancer rates and lower rates of cardiovascular disease. Estimating the effect of religion on health is difficult unless comparisons could be made between a matched control sample of different faiths with similar lifestyle habits and statistically control all other factors.

Margana and Clark's (1995) literature review gathered articles relevant to the relationship of religiosity, health and birth outcomes of Mexican Americans. Their review led to the proposition that religiosity is a potentially powerful reason why Mexican American women have positive pregnancy outcomes, despite poverty and infrequent prenatal visits. The authors suggested further study of the effect of religious and spiritual dimensions to pregnancy outcomes with Mexican American women.

The Self: Perceptual Component

Although a pregnant woman's own perception of her pregnancy can potentially affect birth outcomes, this concept is seldom addressed. One qualitative and two quantitative studies (Corbin, 1987; Oakley, 1992; Sable, Spencer, Stockbaurer, Schramm, Havell & Herman, 1997) were found that reviewed the effect of a woman's perception of her pregnancy on low birth weight and other adverse pregnancy outcomes. Corbin's (1987) grounded theory study revealed that a chronically ill pregnant woman's own beliefs and perception of her risk status affected her compliance to the providers' plan of care. The authors concluded that women often made decisions about their prenatal care based on their own beliefs of risk and perceived options, rather than the provider's assessment and management plan. If the women did not agree with the provider's diagnosis of risk, they did not follow the plan of care, which ultimately could have affect birth outcomes.

Oakley (1992) examined the effect of women's perception of their pregnancy after being labeled high risk by the provider (defined as having a previous low birth weight delivery <2500 gms). One of the questions asked by the midwife researchers during the first home interview with the subjects in this study was "How do you feel about this pregnancy now?" Twenty percent of the women felt very happy with the pregnancy, 36% happy, 33% all right, and 5% unhappy or very unhappy and 6% didn't know. Oakley (1992) suggested that asking women how they feel about their pregnancy during this home visit in early pregnancy may be a better guide to subsequent problems than conventional medical risk assessment. Significant relationships were reported

between positive and negative feelings the women had of their pregnancy with low birth weight and a greater rate of neonatal transfer to a special care unit. The authors refer to a table for the study findings, where p values are recorded; however, no other information on their methodology was given. Furthermore, the subjects level of happiness with their pregnancy may also be influenced by their label as a high risk group for low birth weight.

Sable et al (1997) examined the relationship between pregnancy wantedness, a woman's feelings about her pregnancy and low birth weight and very low birth weight (n = 2,828). The wantedness of the pregnancy was measured by the traditional wantedness question, often seen on an obstetrical history form, *was your pregnancy planned?* In addition, the authors included questions about the woman's feelings about her pregnancy to test the strengths and weaknesses of the more traditional question. The measures of a woman's feelings about her pregnancy and the traditional questions were measured on a four-point likert-scale. The strength of the relationship of the following six independent variables to low and very low birth weight was measured: unintended, mistimed, unwanted, unhappy about, unsure, and denial. Logistic regression analysis revealed that mothers of very low birth weight infants were significantly more likely than those who had a normal weight infant to report unhappiness about the pregnancy. Interestingly no association was found between low birth weight and the answer to the traditional unwantedness question, noted as above. A major weakness of this study was its retrospective nature. The women were questioned during their post partum stay or up to three months after their delivery about their feelings "during pregnancy." Such data collection timing may not adequately reflect a woman's feelings during pregnancy. This

suggested a need for a prospective approach to a woman's perception of her pregnancy, one aspect of the HOPE theory and this study.

Summary

Few studies on maternal and perinatal risk assessment reviewed were guided by a theoretical framework and often nursing studies that were guided by a theoretical framework failed to test these theories. In spite of the potential benefits of perinatal/maternal risk assessment, it is a national objective not yet achieved. There are few outcome studies in the nursing literature, and the outcome studies in the medical literature emphasize biophysical factors that are not modifiable, rather than lifestyle or psychosocial factors that are modifiable. Risk assessment approaches with a biophysical emphasis have low to moderate ability to determine risk in pregnancy. Often, studies with a psychosocial or biophysical focus are not inclusive of the other, even though each focus has helped predict low birth weight, preterm labor and adverse pregnancy outcomes, and combined would be more predictive of poor outcomes.

Subjects in early studies on biophysical or psychosocial risks in pregnancy were often drawn from middle income populations, excluding African-American and other minority subjects. Other limitations included retrospective rather than prospective designs, use of untested instruments, small sample sizes, collapsing adverse birth outcome measures into one category rather than specifying birth outcomes, and not fully describing methodological procedures. No study was found that had a holistic focus, which included socio-demographic, biophysical, psychosocial and spiritual components and the woman's perception of her pregnancy and examined the cumulative effect of

these components to birth weight, weeks of gestation and other adverse pregnancy outcomes.

In this review, birth weight, gestational age, APGAR score and unplanned cesarean birth were significantly related to socio-demographic factors (Braveman, Egerter, Edmonston & Verdon 1995; Hogue & Hargraves, 1993, Melnikow et al 1991), psychosocial factors including stress (Copper et al, 1996), and social support (Copper, et al, 1996). Self esteem was an intermediary factor for behavioral risks in pregnancy (Copper, et al, 1996) and lack of prenatal care (Harvey, 1991). Birth weight was related to depression (Herrera, Salmerson & Hertado, 1997), lifestyle factors (prenatal visits, smoking and drugs) (Chomitz, Cheung & Lieberman, 1995), abuse (McFarlane, Parker & Soeken,1996), religious faith (Fonnebo, 1994) and the woman's own perception of her pregnancy (Sable et al, 1997). Preterm birth was linked to stress (Copper et al, 1996) and lifestyle factors (Chomitz, Cheung & Lieberman, 1995). Stress contributed to dysfunctional labor (Simpkin, 1986) which could lead to unplanned cesarean birth. Lower APGAR scores were associated with maternal depression (Webster, 1994) and unplanned cesarean section was related to race.

Experts suggest that further developments in research in the area of risk assessment is vital to determine specific risk factors linked to low birth weight, preterm labor and other adverse pregnancy outcomes. Managed care is also emphasizing standardized risk criteria within prenatal records to help providers with referral and to improve perinatal outcomes, thus saving money and lives, yet minimizing psychosocial and spiritual components that are included in a holistic approach. The HOPE theory

builds on Curry's (1997) research that examines the relationship of a biopsychosocial model (biophysical factors, stress, support by partner and other, self esteem, lifestyle factors and abuse) to low birth weight.

CHAPTER THREE

METHODS

The purpose of this study was to test the Holistic Obstetrical Problem Evaluation (HOPE) theory by examining the relationship of socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components to birth weight, weeks of gestation and other adverse pregnancy outcomes. The unique focus of this study was attention to spiritual factors and testing of a holistic theory to ascertain if it was more predictive of maternal and perinatal health outcomes than focusing on the separate effects of biophysical and psychosocial factors and the woman's view of her pregnancy. This chapter describes the study design and rationale, sample, operational definitions, research variables, instruments, data collection techniques, human subjects protection, data analysis and delimitations and limitations.

Research Design

This study used a prospective correlational research design since enough was known to go beyond an exploratory study. Independent variables in this study were socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components. These independent variables were drawn from Watson's holistic approach that described mind-body-soul as unity. Dependent variables were chosen that were conceptually linked to the independent variables and have been used as obstetrical standards for classifying health of the mother and baby. The dependent variables were birth weight, gestational age, APGAR score, and unplanned cesarean birth.

Sample

Participants for this study were selected from a convenience sample of pregnant women from three prenatal clinics. One site was an urban university tertiary care center where many high risk pregnant women received care, the majority of whom were low income, uninsured or received TennCare (Medicaid converted to a form of managed care) and where the majority of women from ethnic minority groups in the local community received prenatal care. Another site was the local health department prenatal clinic staffed by nurse-practitioners and physicians where primarily low income and low risk clients were served. The third site was a private obstetrical practice that primarily accepted women with private insurance. This site is staffed by five physicians and two nurse-practitioners.

Although the African-American population in East Tennessee and surrounding counties is small (African-American, Knox county, 9% and 3% other counties), two of the three sites (the health department and university prenatal clinics), included a larger percent of minority populations than the local community's general population. Twenty-seven percent of the prenatal patients at the health department are African-American (personal communication Jan Kaman, Tennessee Department of Health, Knoxville, 1997). In addition, the majority of women from ethnic minority groups in the community received prenatal care at a university medical center and local prenatal clinics. The majority of the university medical center prenatal patients were white and from 13 counties in the surrounding area. The patients usually have incomes below the poverty line, and educational levels are low. This low income combined with limited education

and isolation of the rural Appalachian residents results in an undeserved minority of poor Appalachian whites with a higher rate of low birth weight babies and infant mortality than the general US population (Kids Count Data Book, 1997). Overall, the population served by the university medical center prenatal clinics and the health department did not include American Indian/Alaskan Native, or Asian women.

Criteria for Inclusion

Criteria for inclusion were: women from the general population of prenatal patients who 1) spoke English, 2) had a singleton pregnancy between 16-28 weeks gestation, and 3) were 14-45 years of age. Criteria for inclusion for outcome variables included delivering a live infant. Criteria for exclusion included spontaneous abortion before gestational viability at 24 weeks. To determine sample size a power analysis was performed with SPSS after reviewing published studies that could be used as a template for entering criteria. Based on criteria of 18 variables, with a minimum power of .83, a cumulative R-squared of 0.20 (effect size), and an alpha a .05, (SPSS-SamplePower, 1997, Appendix G) a sample of 120 women was interviewed (100 interviews, and 20 additional interviews for potential loss of subjects.

Operational definitions

Socio-demographic Factors-- Socio-demographic factors included: partnered/not, type of health care insurance, level of difficulty obtaining access to prenatal care, weeks of gestation at first visit, and total number of prenatal care visits (Appendix A). Adolescent age groups, race and education were measured by the Bowman Gray Risk Index (BGRI) (Ernst et al, 1988).

Biophysical component--Biophysical factors were measured by a score from the Bowman Gray Risk Index such as previous history of preterm or low birth weight baby and increased frequency of urinary tract infections (Appendix B).

Psychosocial component-- Factors were measured by subscale scores from the Prenatal Psychosocial Profile (PPP) scale measuring stress, level of support from a partner and others, and self-esteem. Other variables in the psychosocial component included depression, lifestyle risk behaviors (measured by occurrence of smoking, alcohol and drug use) and abuse (Appendix C).

Spiritual component--Factors that are measured by scores from the Spiritual Perspectives Scale and selected questions from the Jarel Well-Being Scale including 1) value of spirituality and 2) importance of church attendance (Appendix D).

Perceptual Component--Six questions that were derived from Sable et al's study (1997) and one from the PI's clinical practice regarding the level of wantedness, happiness, and acceptance of the current pregnancy (Appendix E).

Pregnancy outcomes--Maternal morbidity was an unplanned cesarean birth, and perinatal outcome was defined by birth weight, estimated gestational age at birth, preterm birth (<37 weeks), and APGAR score at five minutes (Appendix F). If there was a discrepancy regarding correct gestational age at birth, a calculation of the mean from the last menstrual period and ultrasound dates were used to obtain the best expected date of delivery (EDD). Finally, the pediatrician/neonatologist's clinical exam of the infant (Dubowitz) was used to measure weeks of gestation when there was any discrepancy of the infant's gestational age.

Measurement

The Holistic Obstetrical Problem Evaluation (HOPE) theory was tested by determining the relationship of socio-demographic, biophysical, psychosocial, spiritual and perceptual components to birth outcomes using the following operationalization (see Table 1): A socio-demographic data form, the Bowman Gray Risk Index, the Prenatal Psychosocial Profile (PPP), depression and lifestyle risk questions, the Abuse Assessment Screen (AAS), the Spiritual Perspective Scale (SPS), the Jarel Well Being Scale demographic questions, and questions related to perception of pregnancy.

Socio-demographic: Socio-demographic factors were collected using the socio-demographic form and the Bowman Gray Risk Index (BGRI). Items included partnered/not, and TennCare insurance/not. Difficulty obtaining prenatal care was measured on a 4-point likert-scale; any level of problem was considered difficulty. Information on weeks of gestation at first visit and total number of prenatal care visits was used to identify characteristics of the sample. Age, race, and education were included and weighted on the Bowman Gray Risk Index. Because of the potential significance of race, this was analyzed as a separate indicator.

Biophysical: The Bowman Gray Preterm Birth and Low Birth Weight Risk Assessment (Ernst et al, 1988). This 16- item instrument identified significant medical history and biophysical factors as well as several socio-demographic risk factors for preterm and low-birth weight babies. Factors were present or not and each was assigned a weight based on the results of prior research. These weights were used to compute a total risk score that ranged from 0-41.

Table 1

List of variables and How They Were Measured

INDEPENDENT VARIABLES	INSTRUMENT	HOW MEASURED
Socio-demographic:		
Partnered	Question	Partnered/not
TennCare	Chart	TennCare/not
Difficulty obtaining PNC	Likert question	0=no, 1=yes
Race	Chart	African-American/not
Biophysical Component	Bowman Gray Risk Index	0=no risk to 41= high risk chart review + ask 2 quest.
Psychosocial Component:	Prenatal Psychosocial Profile:	
Stress	(PPP)	11=low to 44=high stress
Social support: Partner	(PPP)	11=low SS to 66=high SS
Social support: Other	(PPP)	11=low SS to 66=high SS
Self esteem	(PPP)	11=low to 44=high esteem
Depression	Depression screen- 2 questions	0=not depressed,1=depressed
Lifestyle:	Lifestyle questions:	
Smoking	1 question freq of use	0=no smoke, 1= smoke
Drug/ETOH	3 questions freq of use	0=no use, 1= use
Abuse	Abuse Assessment Screen	0=no abuse, 1=abuse
Spiritual Component		
Spirituality	Spiritual Perspective Scale	0=low, 6=high spirituality
Religion-total score	Jarel Spiritual Well Being	≤7=not active, 7>=active
Perceptual Component	6 questions Sable et al	1=accept, 10=unaccept
DEPENDENT VARIABLES	**Instrument**	**How measured**
Birth Weight	Medical Records	Grams at birth
Gestational Age	Medical Records	Weeks of gestation
Preterm Birth		<37 weeks (Yes/No)
APGAR Score	Medical Records	Score at five minutes
Unplanned Cesarean Section	Medical Records	Yes/No

High risk women were defined as having a score of 10 or greater. This instrument was tested with 11,623 pregnant women in a 20-county region of northwest North Carolina, a rural area, similar in culture, climate and health care access to that of East Tennessee (Debra Wallace, personal communication, 1999). Each risk factor was compared to the incidence of preterm and LBW babies. Chi-square analysis was performed and multiple regression analysis to test the relationship between each factor and preterm, low birth weight babies (P-LBW) to find risk factors with the strongest relationship to P-LBW. The full regression model identified 55% of the P-LBW births as true positives, compared to the reduced model with a simplified weighting system that identified 52% of preterm low birth weight babies.

Psychosocial:

1) The Prenatal Psychosocial Profile (PPP) (Curry, Campbell & Christian, 1994) consists of 4 subscale scores that measure stress, social support (from partner and other), and self-esteem in pregnant women on a 44-item scale with likert responses. Summary data from 5 recent studies (Curry, Campbell, & Fields, 1998), wherein the PPP was administered to 3444 rural and urban women of all childbearing ages, support the validity and reliability of the PPP as a measure of stress, support from partner, support from others, and self-esteem with Caucasian and African-American women. Construct validity was evaluated by whether the direction of the subscales, stress, social support and self esteem correlated as described in the literature. With one exception (American Indian) high stress negatively correlated with level of support and self esteem, and high support correlated positively with self esteem. Correlations between the self esteem

scale, stress and support were found with Caucasian and African-American women and not consistently found among rural Hispanic or rural and urban American Indian women. Internal consistency reliabilities for the 4 subscales were evaluated using Cronbach's alphas. All four subscales exceeded .70 (Curry, Burton & Fields, 1998).

a) Stress: The first section of the PPP assessed level of stress. The 11 items on the stress scale were derived from the Daily Hassles Scale (Kanner, Coyne, Schaefer, & Lazarus, 1981). Women indicated the extent to which each item was a current stressor on a 4-point likert-scale (1= low stress, 4 = high stress). Item responses were summed (range 11- 44). Higher scores indicated more stress. Test-retest reliability ranged from .52 -.76, internal consistency reliabilities using Cronbach's alpha ranged from .67-.70. Convergent validity of the stress measure was tested using the Difficult Life Circumstance Scale (DLCS) (Barnard, 1988). The 11 items on the stress scale and the DLCS were highly correlated (Curry, Campbell & Christian, 1994; Curry et al, 1998).

b) Support: The second and third subscale of the PPP assessed level of support from partner and support from other using the Support Behaviors Inventory developed by Brown (1986). Eleven items measured support from partner and support from other on a 6-point likert-scale (1= low support, 6 = high support). Brown reported face validity and internal consistency reliabilities of .90 or greater when administered to a sample of pregnant women. Item responses were summed (range 11-66). Higher scores indicated more satisfaction with support. Convergent validity, internal consistency reliabilities >.90, and test-retest reliability have been reported (Curry, Campbell & Christian, 1994). In the present study, the partner support item created a measurement dilemma. Unlike

married and single women who stated they had partner support, a number of women who were single and stated they had no support, or who were married living alone, did not respond to the Prenatal Psychosocial Profile's (PPP) partner support subscale. Since they had no partner presence, they could not respond to the likert- style questions inquiring about level of satisfaction with partner support. Lack of response to questions about level of satisfaction with partner support by subjects without any support was considered missing data in the analysis, and these cases were omitted in a listwise fashion. To avoid losing valuable information about childbearing women without any partner support, a "partner support" dichotomous variable (yes, no) was created to capture the cases of women without any partner support.

c) Self-esteem: The fourth subscale of the PPP assessed level of self esteem. The self acceptance aspect of self-esteem was measured by 10 items derived from the Rosenberg Self-Esteem Scale (1965) and a 11th item concerning control over one's life. All items were on a 4-point likert-scale (1 = strongly agree and 4 = strongly disagree). Items were reversed scored to indicate higher scores with higher levels of self esteem. The response sets were summed (range 11- 44). Test- retest reliability has been reported as well as construct validity and internal consistency reliabilities >.80 (Curry, Campbell & Christian, 1994).

2) Depression: Two items were used to measure depression. The single item, "Do you often feel sad or depressed?" was recommended by a Yale Task Force on Geriatric Assessment. It has a response set of yes/ no and correctly identified depressed patients and outperformed a thirty-item questionnaire (Geriatric Depression Scale, GDS). The

GDS was well validated for screening affective status among older populations. The one question interview had a sensitivity of .69 and specificity of .90, correctly diagnosing 85.4% of depressed patients, compared to a longer tool (GDS) that had a .54 sensitivity and .93 specificity, correctly diagnosing 80% of the depressed patients (Mahoney et al, 1994). Chochinov, Wilson, Enns, & Lander (1997) also reported the single item screening question, *Are you depressed*? correctly identified the eventual outcome of every depressed patient (100% sensitivity), out-performing the Beck Depression Inventory and a visual analog scale. A second question was asked to assess level of depression: *Have you had a loss of interest in pleasurable activities,* was adapted from Spitzer, Endicott & Robins' (1978) (SADS) Schedule for Affective Disorders and Schizophrenia. This question has been well validated with medically ill patients (Chochinov et al, 1997). A yes/no response set was used to measure depression. A yes response to either of these questions indicated depression.

3) Lifestyle risk behaviors: Data on substance use included four questions asked regarding level of smoking, alcohol and drug use modified from Norbeck & Anderson's (1989) study and Curry's (1998) current study. A yes answer to any smoking was coded as a lifestyle risk. A yes answer to any of the drug and alcohol questions was coded as a lifestyle risk. Although smoking is also on the Bowman Gray Risk Index, because of its potential significance it was more appropriate to analyze it within the psychosocial component. There are extensive reports concluding that smokers have smaller babies than non-smokers. Since the 1970's the Surgeon General has reported smoking cigarettes during pregnancy is linked with fetal growth retardation and infant mortality (Chomitz,

Cheung & Lieberman, 1995).

4) Abuse Assessment Screen (AAS) (McFarlane, Parker, Soeken, Bullock, 1992). This tool was developed by the Nursing Research Consortium on Violence and Abuse to measure abuse status in pregnancy. The three dichotomous (yes/no) items on the shortened version of the AAS included specific information on being hit, slapped, kicked or otherwise hurt during pregnancy or within the last year and being forced into sexual activities in the last year. Content validity was established with a panel of 12 nurses who worked in the area of abuse. Internal consistency reliability has been reported at .79. The three item AAS was compared to a 30 item abuse tool (ISA) and found to yield valid and specific identification of abuse. The AAS detected 17% (1/6) prevalence of physical and sexual abuse during pregnancy in McFarlane et al's (1992) study. A positive answer to any of the three questions was coded as abused.

Spirituality: The Spiritual Perspective Scale (SPS) (Reed, 1986) measured saliency of spiritual views in a participant's life and is congruent with Watson's definition of spirituality. There are 10 items measured on a 6 point likert-scale (1 = low, 6 = high). The SPS is scored by summing responses of the 10 items (range10 to 60). The mean of this total score is then calculated and ranged from 1 to 6. Higher scores indicated greater value of spirituality. Reliability, estimated by Cronbach's alpha, was consistently above .90. Average inter-item correlations range from .54 to .60 across adult groups. All item-scale correlations were above .60 (Reed, 1987). The SPS has demonstrated criterion and discriminate validity. Women and lower socio-economic groups tended to score higher on the SPS and other similar instruments. Participants who

do not identify a religious background scored significantly lower on the SPS scale than those participants who identified a religious background (Reed, 1986, 1987).

Three demographic items measuring religiosity derived from the Jarel Spiritual Well Being Scale (Hungelman, Kenkel-Rossi, Klassen & Stollenwerk, 1985) were included. These items were derived from demographic data measuring the importance on a 4- point likert-scale (1= not important and 4 = very important) of attending religious services and how often religious services were attended on a 7- point likert-scale (1 = not at all, 7 = more than once a week). Item scores were summed. Total scores ranged from a low of 3 (not important, and not attending at all) to a high of 18, indicating very important and attending more than once a week. A score of 7 was measured as active religiosity, less than 7 was measured as inactive religiosity. The level of 7 and above must have indicated "important," and at least wanting to attend, or actually attending at least once a month.

Perceptual Component: The woman's own perception of her pregnancy was measured by one likert style question; five dichotomous (yes/no) questions similar to the pregnancy wantedness and happiness questions that were significantly related to low and very low birth weight in Sable et al's (1997) study and, one question derived from this midwife's clinical experience.

The first question, "how do you feel about being pregnant now?" was measured on a 5- point likert-scale (1 = very unhappy to 5 = very happy). This question was followed by the five dichotomous questions (0=false, 1=true), and one question based on clinical practice indicating level of acceptance of the pregnancy, "I expect to have a

normal birth." (Yes = 0, No = 1). All dichotomous questions were reversed for higher scores to indicate negative expectations. Total scores range from a low of 0 to a high of 5. Item responses from the likert question were summed with the 5 dichotomous questions for a total score range from a low of 1 to a high of 10. Higher scores indicated greater unhappiness, fearful expectations, pregnancy unwantedness and lower expectations for a normal birth. Sable derived these variables from the National Survey of Family Growth (NSFG), the most comprehensive source of information available on pregnancy and contraception for reproductive age women in the United States (London, Peterson & Piccinino, 1995).

Data Collection

Interview

Data was collected by the midwife researcher and a trained research assistant, who signed a confidentiality form. Participants in the study were recruited by the principal investigator (PI) or research assistant (RA) during the client's prenatal visit. The nursing staff at the respective sites agreed to facilitate this process. The PI or RA explained the details of the study, provided interested participants an introductory letter and an informed consent document. After the PI or research assistant obtained informed consent, a private area for obtaining interviews during routine clinic visits was provided. Interviews took place while patients were waiting for one hour Glucose Tolerance Test (GTT), after prenatal appointments, and were adapted to fit with the subject's appointment schedule. Each interview took approximately 10-20 minutes and consisted of questions using the 4 instruments, the lifestyle and depression questions, and socio-

demographic data. For ease of understanding, questions were administered verbally.

Flash cards with response sets in large smiley faces were used for the PPP likert-style questions; flash cards with numbers and anchors corresponding were used with the other response sets. Smiley-face response cards provided a visual picture of the responses with the likert-type scales in the PPP instrument. These cards were successfully used in five studies using the PPP instrument (Curry, 1998). These efforts helped to avoid problems with literacy (Appendix H).

Record Review

Biophysical information was gathered from the subject's prenatal record. This took approximately 10 minutes per record. Data was transferred from the patient's prenatal care record to the Bowman Gray Risk Index (BGRI) and weighted according to the assigned score for each item. The majority of the sixteen items included on the Bowman Gray Risk Index were recorded from the university medical center's prenatal record and then scored and summed according to the Bowman Gray Risk Index. Three items not on the university medical center and health department forms that are on the Bowman Gray Risk Index were added to the interview questions on the socio-demographic form. Outcome measures were obtained from the delivery records at the university medical center and a private-for-profit hospital. Both centers served patients from the prenatal clinics.

All data were coded with an ID number to connect interviewer and record data for each participant, and a master list of code numbers and names were locked in a file at a central location at UTK College of nursing. Completed data sets were kept in a locked

file and destroyed after analysis. The researcher stored this data set on a diskette per UTK IRB protocol. Total activities for this project were completed in 12 months. For quality assurance, all data were entered and verified before analysis to rule out error.

Protection of Human Subjects

Approval was obtained from the College of Nursing human subjects review committee, the University of Tennessee's Institutional Review Board, and other sites involved including the University of Tennessee's Medical Center at Knoxville, Woman's Health Associates, Knox county Health Department, and Methodist Medical Center in Oak Ridge, Tennessee. Letters of access to sites are included (Appendix I). Each participant was informed of the purpose of the study before being asked to participate. Written consents were obtained and participants were informed that they were not obligated to participate and they may withdraw at any time. Their decision to participate, or not, would in no way effect the care they received. The informants were assured of confidentiality of information.

After the interviews, all subjects were asked if this interview brought up concerns or questions they would like to discuss with the prenatal care provider or whether they would like the interviewer to approach the prenatal care provider with their concern or question. In addition, all women in the study were offered a card with community resources for chemically dependent and abused women. Participants were also given a card with community resources for chemically dependent treatment programs.

There was potentially a slight risk for women who participated in this study. It was possible that the interview may be stressful to the pregnant woman. However, results of studies that used risk assessment suggested that the potential benefits of discovering markers of risk, such as lack of social support, stress, battering and unhealthy lifestyles, that could lead to appropriate interventions, would modify these risks and thus improve birth outcomes (Brown, 1995; Institute of Medicine, 1985; Selwyn, 1990). Immediate follow-up by health care providers at the site was available for subjects experiencing any problems with questions related to the HOPE assessment. In addition, the PI was a certified nurse-midwife with 24 years of experience, sensitive and experienced in addressing these situations.

As a result of these questions several women asked the PI or the research assistant to speak with their provider about a concern, and others stated their plans to speak with their provider directly about a concern brought up by the interview. As a result of their request, the woman was either referred to a social worker for consultation or to their health care provider to further address their concerns. The providers often made notations about these concerns in the patient's charts. Interventions initiated as a result of these referrals and follow up may have positively altered maternal and infant outcomes, yet not to act in the face of information potentially harmful to the woman, would have been unethical.

Data Analysis

Analysis of data was divided into three areas, the descriptive measures of central tendency, reliability, and testing of the research questions. The descriptive analysis provided a profile of the subjects who participated and included frequencies, means, standard deviations, ranges, proportions and percentiles for all variables as appropriate to the level of measurement. The second phase included computing Cronbach alpha reliability coefficients for the Prenatal Psychosocial Profile (PPP) subscales and the Spiritual Perspectives Scale. The investigator assessed multicollinearity and no threats to generalizability were found. In the third phase the investigator determined the components and factors significantly related to the incidence of the outcome variables. Multiple and logistic regression analyses were used to answer research questions 1-4. All independent variables were entered into the regression equations simultaneously in order to allow a comprehensive view of pregnancy risk, as described by the HOPE theory. The *All Possible Regression Procedure* and logistic regression analysis from NCSS 2000 (Number Cruncher Statistical Systems, 1999) Version 6.0 for Windows 95 (Hintz, 1998) was used for analysis of the data. Statistical significance was set at .05 for all tests.

Delimitations

A holistic risk assessment model can aid nurse-midwives, nurse-practitioners, and physicians with identification and thus prevention of poor perinatal/maternal outcomes in the following ways:

1) Identifies significant risk factors related to outcomes of pregnancy that could provide the basis for development of a holistic risk assessment tool as part of the prenatal

record.

2) Assists providers with knowledge of factors that could be used in decision making for interventions or referral of the pregnant women to an appropriate level of provider and/or hospital (Sokol et al, 1977; Wall, Sinclair, Nelson & Toffler, 1989). Knowing multiple risk factors that influence each other, and that are more predictive of low birth weight and other poor perinatal outcomes can assist providers with clinical assessment of their clients. Because pregnancy is a dynamic process, a woman's risk status can change at any point. To meet the unpredictable risks of pregnancy, Healthy People 2000 (USDHHS, 1996) recommends development of comprehensive and coordinated perinatal care. Tennessee and other states have developed coordinated systems of regional special care units to meet this need. These regional systems provide care and are available for care and referral of high risk mothers and/or neonates. Tennessee's regionalization program provides perinatal guidelines for patient acuity at level one, two and three birth settings. For example, a nurse-midwife at a level-one facility, such as a birth center, would have ready access to a perinatologist at a level-three facility if a woman's risk status changed from low risk to high risk. In addition, nurse-midwives, nurse-practitioners and physicians practicing at level one or two birth settings, may refer clients to these tertiary care settings that have neonatal intensive care (NICU) and high risk perinatal units.

3) Supports the current emphasis by managed care to include standardized risk management criteria as part of the prenatal record to enhance a provider's clinical skills, reduce high risk pregnancy, contain costs, and decrease law suits through prevention and

awareness of potential problems (Brown, 1995). Pressure for cost containment from managed care has led to more pregnancies managed by midwives and family physicians who often practice in level one or level two settings. Yet, these providers may not have ready access to high risk centers and/or skills to perform emergency procedures available with obstetricians at level two and three hospital settings (Kelly, Acheson, & Zyzanski, 1988). Managed care organizations are beginning to address this potential problem by including standardized risk management criteria as part of a prenatal record. The changes in health care delivery since the advent of managed care challenge physicians, nurses and midwives to seek creative and cost-effective methods to reduce the human and financial costs associated with high risk pregnancy. Transporting a potentially high risk mother and/or fetus while the baby is in utero, rather than transporting a newborn to an NICU unit after the delivery saves lives and money.

4) Scientifically evaluates the effectiveness of a holistic management style by addressing psychosocial, spiritual, and perceptual factors that may have a negative impact on the pregnancy and may be under the direct control of the client to change, with the support of the provider.

5) Meets Healthy People 2000 (USDHHS, 1996) recommendations for additional research to discover factors associated with fetal, infant, and maternal mortality so that effective programs can be designed and implemented.

It is highly relevant for nurses and midwives to contribute our expert research skills and knowledge toward preventive approaches to this problem. Then, women and their providers will not only know predictors of low birth weight and other adverse birth

outcomes, thus preventing a possible poor outcome, but the woman herself may also recognize risk factors that are within her power to change. This could empower the woman to take action to increase the health and harmony of her pregnancy.

Summary

Watson's theory of care and holism provided the theoretical rationale to test the Holistic Obstetrical Problem Evaluation (HOPE) theory by examining the relationship of socio-demographic, biophysical, psychosocial and spiritual components and the woman's own view of her pregnancy to low birth weight, gestational age, unplanned cesarean section (or not) and APGAR score. This study used a prospective correlational research design with a convenience sample of 120 women from three prenatal sites. The Bowman Gray Risk Index, the Prenatal Psychosocial Profile (PPP), depression and lifestyle questions, the Abuse Assessment Screen (AAS), the Spiritual Perspectives Scale (SPS), the Jarel Spiritual Well Being demographic questions, and perceptual questions from Sable et al (1997) were used to measure biophysical, psychosocial, spiritual and perceptual components. Data were collected through interviews of 120 women from 16-28 weeks and from the medical record review. Three phases of analysis were conducted including multiple and logistic regression.

CHAPTER FOUR

RESULTS

In this chapter the findings of the study are presented in three sections. The first section describes the socio-demographic profile of the subjects. The second section describes the biophysical, psychosocial, and perceptual profile of the subjects and the psychometric properties of the instruments used in the study. The third section reports the findings from the multiple regression and logistic regression analysis performed to determine the relationship of the independent variables (biophysical, psychosocial and spiritual components and perceptual factors) to the dependent variables (birth weight, APGAR score, gestational age and unplanned cesarean section).

Sample

A total of 120 interviews were completed from the volunteer participants at the three study sites. One woman who completed the interview moved from the area prior to collection of birth data. Women in the sample were reflective of the general population from East Tennessee with respect to partner status and ethnicity (Table 2). Women from East Tennessee usually have incomes below the poverty line, educational levels are low and the African-American population in East Tennessee and surrounding counties is small (9% Knoxville and 3% other counties) (Kids Count Data Book, 1997). Overall, the population served by UTKMC prenatal clinics and the Knox County health department included few American Indian, Hispanic or Asian women. The sites were also reflective of providers who participated in the TennCare insurance program.

Table 2

Socio-demographic Data on Partner, Ethnicity, Insurance, and Problems with Access to Prenatal care

Variable	n	%
Partner Status		
Married/with partner	65	54.2
Married living alone	2	1.7
Single living with partner	25	20.7
Single living alone	28	23.3
Ethnicity		
Anglo-American	107	89.2
African-American	12	10.0
Other	1	.8
Insurance		
Private	29	24.2
TennCare (formerly Medicaid)	87	72.5
TriCare	1	.8
Medicare	3	2.5
Problems with access to prenatal care		
No problem	112	93.3
Problem	5	4.2
Moderate Problem	2	1.7
Severe Problem	1	.8

N =120

Socio-demographic Factors

The majority of subjects in this study were married, living with their partner and Anglo-American (Table 2). Twelve subjects were African-American (10%) and one subject was Hispanic (.8%). Of the total sample interviewed, 65% graduated from high school. The mean educational level (highest current grade in school or highest grade achieved) was 12.01 years (Table 3). Seventeen percent were adolescent. One of the research sites had a separate adolescent clinic other than the study site, consequently fewer adolescents were interviewed than expected. The majority of women had been pregnant more than one time (gravida, $\underline{M} = 2.4$, range 1-9), and had delivered at least one child ($\underline{M} = .86$, range 0 - 4) (Table 3). On the average, the subjects had 4.2 prenatal visits at the time of the interview (between 16-28 weeks of gestation) and were 11 weeks pregnant at their first prenatal visit.

No woman interviewed was without either public or private insurance coverage (Table 2). The majority were receiving TennCare health care insurance, a form of managed care for those previously on Medicaid or uninsurable; otherwise women had private or other forms of insurance (3.3% had other insurance, Medicare or TriCare). Ninety three percent of the women reported no problem with access to prenatal care. For those who experienced problems with access to prenatal care, the following reasons were cited: One person had an insurance problem, one person had transportation difficulties, and four women did not identify their problems. No subject chose the reasons *can't find a provider, problem with child care, or lifestyle issues.*

Table 3

Socio-demographic Data on Education, Gravida, Parity, Number of Prenatal Visits at Time of Interview, and Weeks of Gestation at Time of First Prenatal visit

Variable	M	SD	Range
Education	12.1	1.81	8 - 18
Gravida (# pregnancies)	2.4	1.50	1 - 9
Parity (# births over 20 weeks)	.86	.88	0 - 4
Number of prenatal visits at time of interview	4.2	1.81	1 - 9
Weeks of pregnancy at time of first visit to provider	11.0	4.38	4 - 26

Biophysical Component

Few women had biophysical risks as identified by the Bowman Gray Risk Index. Higher scores indicated greater biophysical risk. The group was low risk with an average score of 1.71 (SD 2.19). The most frequently reported biophysical risks in order of importance were: a) high school drop out, b)16-19 years of age, and c) two or more abortions (spontaneous or elected) before fourteen weeks of gestation. The average biophysical score for the mothers of the four LBW babies was 4.75, three times the biophysical score of the other women in the study (scores ranged from 0 -11). The biophysical score for the mother of the very low birth weight (VLBW) infant delivered at 32 weeks was seven, much higher than the average scores. The biophysical score of the mother who delivered her infant at 34 weeks 2 days was zero, much lower than the average in this sample.

Psychosocial Component

There were seven factors for the psychosocial component, including stress, partner support, other support, self-esteem, depression, lifestyle behavior risks, and abuse.

Stress

The women reported low levels of stress (Table 4). Higher scores indicated greater levels of stress. The most frequently reported stressors from the stress subscale in order of importance were: a) other money worries (ie. bills, etc.); b) generally feeling overloaded; and

c) financial worries (ie. food, shelter, health care, transportation).

Table 4

Psychosocial Profile for Stress, Partner Social Support, Other Social Support, and Self-Esteem.

Variable	N	M	SD	Range
Stress	120	17.37	4.20	11 - 44
Social Support-Partner	112 (8 reported no partner support)	52.91	13.38	11 - 66
Social Support- Other	119 (1 reported no other support)	54.52	12.66	11 - 66
Self-esteem	120	34.73	4.74	11 - 44

Social Support

Women who had partners (n = 112) reported high levels of satisfaction with support from partner. The most frequently reported partner support items in order of importance were: a) lets me know he/she will be around if I need assistance; b) allows me to talk about things that are very personal and private; and c) takes me seriously when I have concerns. Eight women reported no partner support. Women that had other support (n = 119) reported high levels of satisfaction with support. The most frequently reported items for other support were similar to those described with partner support and included: a) lets me know he/she will be around if I need assistance; b) helps me out when I'm in a pinch; and c) takes me seriously when I have concerns.

Self Esteem

Women reported moderately high levels of self esteem. Higher scores indicated greater levels of self - esteem. The most frequently reported self-esteem items in order of importance were: a) all in all, feel that you are a failure (answered no), b) feel that you have a number of good qualities, and c) feel that you're a person of worth, at least on an equal basis with others.

Depression

The results reveal that half of the study participants reported depression (Table 5). Forty-five percent responded affirmatively to: Do you often feel sad or depressed, and 27% responded yes to: Have you experienced a recent loss of interest in pleasurable activities. The high frequency of depression was an unexpected and alarming finding. No studies were found that described frequency of depression among pregnant women.

Table 5

Psychosocial Profile for Depression, Lifestyle risks, and Abuse

Variable	N	%
Depression		
Not depressed	59	49.2
Depressed	61	50.8
Lifestyle Risks		
Smoking	50	41.7
Substance use (ETOH+drugs)	7	5.8
Abuse		
No abuse	102	85.0
Abuse	18	15.0

Lifestyle Behavior Risks

Lifestyle risks included smoking, alcohol and drug use (Table 5). A yes to any frequency of smoking was coded as smoking. Almost 50% of the pregnant women in this sample smoked; whereas, the US national average for smoking is 13.9% (USDHHS, 1997). Nearly one-fourth of the women smoked a pack a day. Several women reported drinking in pregnancy (1.7%), the latter was higher than the US national average of drinking in pregnancy (1.5%). Marijuana was the drug of choice (4.1%) and one woman smoked 6-8 marijuana cigarettes a week. No one reported use of hard drugs.

Abuse

Although most women reported no abuse (Table 5), fifteen percent of women in this study have been hit, slapped, or kicked within the past year. Seven women (5.8%) had been hit, slapped, kicked during pregnancy and two women were forced into sex activities during the last year. Only 4 (3%) of the 15 women who reported abuse also reported stress with abuse. The Prenatal Psychosocial Profile's (PPP) abuse question imbedded in the stress scale is: To what extent is current abuse- sexual, emotional, or physical a current hassle or stressor for you. Stress with abuse ranged from some stress to severe stress. Curry (1998) reported greater frequency of abuse (26%) than respondents in the HOPE study. Twenty-six percent of these ethnically diverse urban low income women in Curry's (1998) study suffered abuse within the last year, 10.5% suffered abuse during pregnancy and 4.5% were forced into sexual activities during the last year. Overall, 14% reported abuse stress, yet 67% classified as abused reported no abuse stress.

Spiritual Component

High levels of spirituality were reported by these women, and church attendance was highly valued. The average spirituality score was 48.02 (SD 9.48, range 10 - 60). The most frequently reported spirituality items in order of importance were: a) strongly agree that forgiveness is an important part of my spirituality; b) engage in private prayer or meditation about once a day; and c) frequently feel very close to God or a "higher power" in prayer, during public worship, or at important moments in my daily life. Almost all respondents said that they prayed or meditated once a day (question 6 on SPS scale). One woman answered the Spiritual Perspective Scale's open question: Do you have any views

about the importance or meaning of spirituality in your life that have not been addressed by the previous questions? "A personal relationship with Lord Jesus Christ is more important than anything else on earth and it will take you to heaven if you've been forgiven of your sins."

Active religiosity scores were high. Most women reported either wanting to attend a religious service once a week or actually attending once a week. Religiosity was scored active religiosity, 7 or above, and inactive religiosity, below 7. Active religiosity scores of seven and above meant: a) at least placing importance on attending a religious service, and either b) wanting to attend a religious service at least once a month, or c) actually attending a service at least once a month. Most subjects reported that attending religious service was important (36.7%) or very important (35%). Also the majority of subjects (49%) would attend religious service more than once a week if they were able, and (29.2%) stated that they actually attended once a week. Religious affiliation was reported as Baptist (63.6%), followed by other Protestant faiths (20.3%), and no affiliation (15.8%).

Perceptual Component

Generally women had positive feelings towards their pregnancy, acceptance of their pregnancy and expectations for a normal birth experience. Higher scores indicated greater unhappiness, less acceptance and lower expectations. The woman's own perception of her pregnancy scores averaged 3.11 (SD 1.68, range 1 - 10). Of the women interviewed, 95% expected to have a normal birth.

Measurement

Reliability, estimated by Cronbach's alpha coefficient, was computed for each of the Prenatal Psychosocial Profile (PPP) subscales (level of stress, social support from partner and other, and self esteem) and the Spiritual Perspective Scale (SPS). The Cronbach's alpha for the Stress subscale was .67, both Social Support subscales were .96, and the Self Esteem subscale was .82. The reliability coefficients of the PPP scales were comparable to those reported by Curry, Burton & Fields (1998). The alpha coefficient for the Spiritual Perspectives Scale (SPS) was .91, also comparable to that previously reported with women of child bearing age (Reed, 1986).

Birth Outcomes

Infant birth weight, gestational age at birth, APGAR score and cesarean birth information was obtained from labor and delivery records at two hospital delivery sites (Table 6).

Table 6

Average Birth Weight, Gestational Age, and APGAR Score

Variable	M	SD	Range
Birth Weight (grams)	3324	497	1457 - 4508
Gestational Age	38.75	1.52	32 - 41.3
APGAR Score	8.78	.61	5 - 10

N = 119

The mean birth weight, 3324 grams, (7 lb. 5 oz) (Table 6) was only two ounces lower than the 1995 mean birth weight for the United States, 3,350 grams (7 lb, 7 oz) (Ventura et al, 1997). The average gestation at birth was 38.75 weeks (Table 6). Infants

in this sample generally delivered at an earlier gestation than reported in other studies. Two studies, at public sector sites, reported a greater average length of gestation at birth than this sample. In Pagel et al's study (1990) the average gestational age at birth was 39.8 weeks (n = 100), and 39.5 weeks (n = 3,073) in Zimmer-Gembeck and Helfand's (1996) study.

The high frequency of low birth weight in Tennessee (8.8%) was not reflected in this sample (3.4 %) (Table 7). There were only four low birth weight babies and one of these infants weighed 1457 grams (3lb 3oz), defined as very low birth weight (Table 8). Overall, 23% of the infants were preterm (Table 7). This is twice the rate of the national average for preterm birth (11%) (Ventura et al, 1997), however only two infants were delivered before 34 weeks. One infant had an APGAR score below 7 at 5 minutes (.8%), lower than the national average of 1.4% (Ventura et al, 1997). This term infant died of a congenital heart defect within 24 hours after birth. Two of the 119 subjects had unplanned (unscheduled) cesarean births (.016%); scheduled cesarean births were not reported in this sample. One unplanned cesarean birth was due to premature rupture of membranes at 37 weeks gestation with a footling breech presentation; the other unscheduled cesarean was performed due to at a non-reassuring fetal heart rate pattern and cephalo- pelvic disproportion (CPD) at 40.6 weeks gestation.

Table 7

Birth Outcomes: Low Birth Weight (LBW), Preterm Birth (PTB), APGAR<7@5 minutes and Unplanned Cesarean Birth

Variable	n	%
LBW (<2500 gms)	4	3.4
PTB (<37 weeks)	27	22.7
APGAR <7 @ 5 minutes	1	.8
Unplanned Cesarean Birth	2	1.7

N = 119

Table 8

Description of LBW infants

Birth weight	Gestational age	APGAR
2296	37.40	9
2325	37	9
1457* VLBW	32	7
2495	37.20	9

N = 4

Descriptive Sample Summary

Women in this sample reported few problems with access to health care, reported low biophysical and psychosocial risks, were highly spiritual and had generally positive perceptions of their pregnancy. Unexpectedly, over half of the women reported feeling depressed, and 15% reported abuse. Nearly half of the women smoked, and few used drugs or alcohol. Levels of stress, partner social support, other social support, and self esteem scores were similar to those reported in other studies (Table 9), whereas the incidence of

smoking was much higher than reported in other studies. No studies were found that reported the incidence of depression in pregnancy, therefore, no comparisons could be made. Although frequency of abuse,(Table 9) and drug and alcohol use was lower in this sample than in other studies; their potential harm in pregnancy is still of grave concern. Women delivered babies of slightly lower than average weight, yet there were only four low birth weight babies in this sample, much lower than the national average. Unlike the positive outcomes for birth weight, this sample of women had twice the preterm delivery rate than the national average.

Table 9

Comparison of Scores: Stress, Partner Support, Other Support, Self-esteem and Abuse

Study	N	Stress M	Partner Support M	Other Support M	Self-esteem M	Abuse M
N. C. study(a)	234	18.89	56.97	52.74	34.37	
Oregon study(b)	349	21.13	52.43	51.04	36.87	25.7% (c)
HOPE study	120	17.37	52.91	54.52	34.73	15%

a) North Carolina Study report (Curry, Burton & Fields, 1998)
b) Oregon Preterm Birth Prevention Study (Curry, Burton & Fields, 1998)
c) Curry (1998).

Multiple and Logistic Regression Analysis

The *All Possible Regressions* procedure from NCSS-2000's or SAS statistical package finds the best combination of variables that explain birth weight, gestational age and APGAR score. Due to the low incidence of unplanned cesarean birth, further analysis of this variable was not performed. The normality of residuals was examined by normal probability plots and goodness of fits tests. The robust regression approach and multiple

regression diagnostics were used to look for and validate any unusual observations in the data set, of which there were two. As a result of these diagnostics, two outliers were removed before analysis. One birth weight case was removed and one gestational age case. The birth weight case was an 8lb 2 oz infant delivered at 34 weeks gestation. Because this was an unusual birth weight for a preterm infant the Dubowitz assessment was evaluated to determine possible error. The pediatrician's Dubowitz exam confirmed that despite the large birth weight this preterm infant was actually 34 weeks gestational age at birth. The other outlier removed was a gestational age case; an infant delivered at 32 weeks gestation.

The 16 independent variables (Table 1, Chapter 3) were then entered into an *All Possible Regressions* algorithm simultaneously to allow a comprehensive view of pregnancy risk and to discover the best set of variables to explain birth outcomes. The *All Possible Regressions* procedure examined all of the possible relationships to determine the most relevant subset. The goal was to balance parsimony and fit. The *All Possible Regressions* can use the following three statistical criterion to determine a model having the best fit to explain birth weight and gestational age: 1) R^2; 2) mean square error; or 3) cp criterion. However, predictive fit was better evaluated with the press value, an acronym for prediction of sum of squares, and r-squared press, reflecting the predictive ability of the model. In calculating the r-squared press an individual observation was omitted at each time, while using the remaining N-1 observation to predict the omitted observation; this was done N times. This r-squared press was computed from those manipulated observations (holding out one observation each time). In addition, models were also selected where multicollinarity was not a problem. With the exception of

preterm birth, logistic regression analysis could not be used to analyze the data because of the low incidence of LBW infants and at risk APGAR scores of <7 at 5 minutes. Multiple regression analysis was used to analyze the continuous variables, birth weight, weeks gestation and APGAR score.

Research question #1: What is the relationship of socio-demographic, biophysical, psychosocial, and spiritual components and the women's own perception of her pregnancy in mid-pregnancy with birth weight? The previously discussed criterion were applied to find the best fitting subset to predict birth weight and was based on: 1)R^2 ; 2) mean square error; 3) a positive press R^2. Based on this criterion a six variable model was chosen. This model included the following six variables from the socio-demographic, psychosocial, and spiritual component: Race, partner support, social support from others, smoking, self-esteem, and spirituality (Table 10). While this model was significant, it was not highly predictive. Press R^2 (.01), reflecting the predictability of the model was low.

Within this statistical model, African-American race and partner support were significant variables for explaining birth weight. African-American women delivered infants, weighing on the average, 310 grams (nearly a pound) less than Anglo-American women. Women without partner support were more likely to deliver infants weighing, on the average, 473 grams (one and one half pounds) less than women with partner support. Increased levels of self esteem and spirituality were positively associated with birth weight, while other support and smoking were negatively associated with birth weight

Table 10

HOPE Theory and Birth Weight

Variable	b	t	p
Race (African-American = 1)	-310.46	-2.04	.04*
Partner Support (1=yes, 0=no)	473.22	2.65	.008*
Other Support	-6.33	-1.67	.10
Self Esteem	16.89	1.67	.10
Smoke (1 = yes)	-115.55	-1.25	.21
Spirit	5.01	.98	.32

N = 119 , *p≤ .05, Model R-Squared = .14 (p = .007), Press R-Square .01

Within this statistical model, African-American race and partner support were significant variables for explaining birth weight. African-American women delivered infants, weighing on the average, 310 grams (nearly a pound) less than Anglo-American women. Women without partner support were more likely to deliver infants weighing, on the average, 473 grams (one and one half pounds) less than women with partner support. Increased levels of self esteem and spirituality were positively associated with birth weight, while other support and smoking were negatively associated with birth weight (Figure 2).

Research Question #2: What is the relationship of socio-demographic, biophysical, psychosocial, and spiritual components and the women's own perception of her pregnancy in mid-pregnancy with gestational age? Previous criteria were applied to find the best fitting model to explain gestational age.

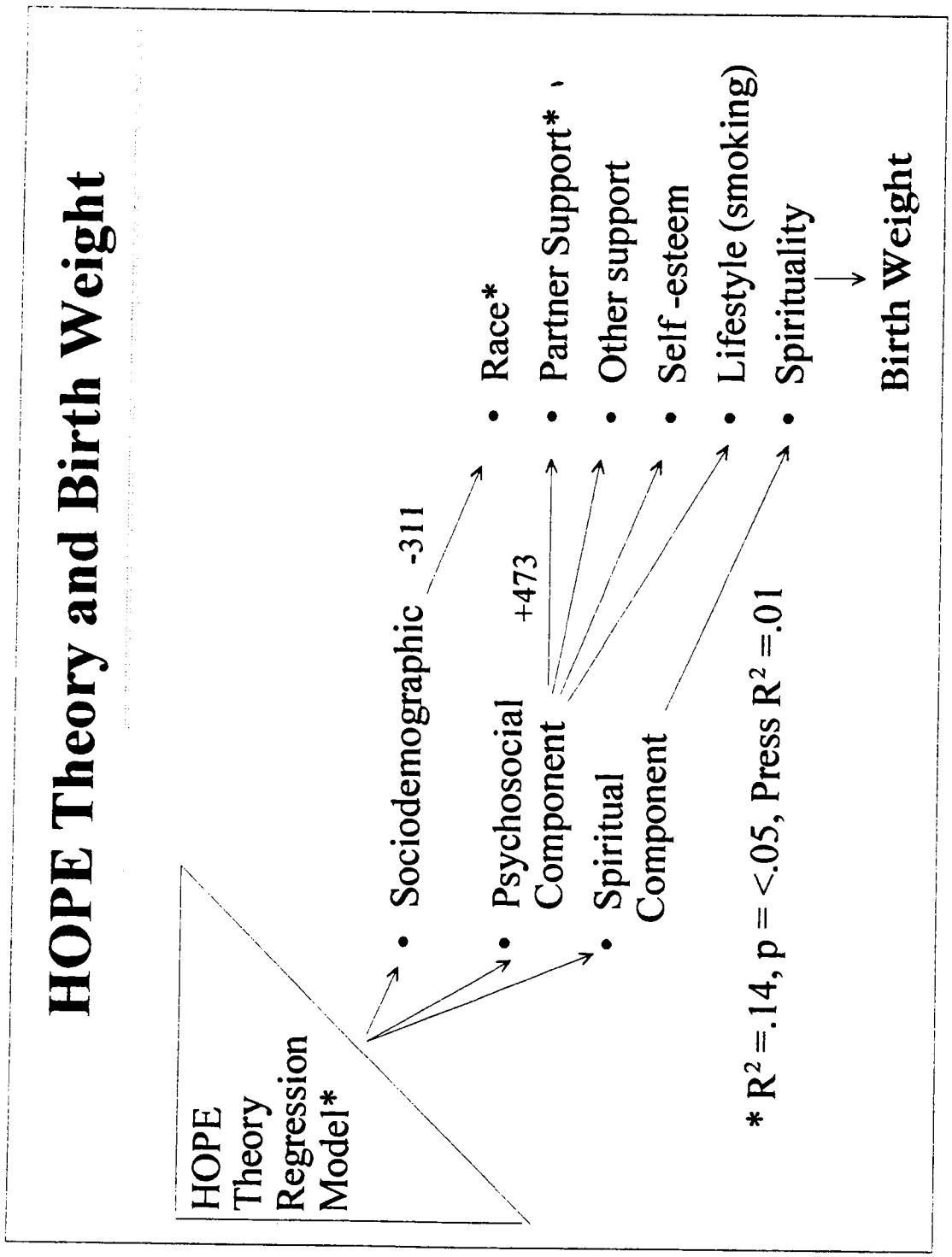


Figure 2

Hope Theory and Birth weight

This statistical model included five variables from the socio-demographic, psychosocial, spiritual and perceptual component: TennCare Insurance, self-esteem, use of drugs, religiosity, and the woman's level of unhappiness and lack of acceptance towards her pregnancy (Table 11).

Table 11

Hope Theory and Gestational Age

Variable	b	t	p
TennCare	.417	1.449	.15
Self-esteem	.06	2.255	.026*
Drugs & ETOH	-1.156	-2.156	.03*
Religiosity (active)	-1.098	-2.784	.006*
Perception	-.115	-1.510	.13

N=119 *p≤ .05, Model R-Square = .15, (p<.002), Press R-Square = .028

Increased levels of self esteem were associated with a greater length of gestation age at birth; whereas, use of drugs and alcohol and active religiosity were associated with a shorter length of gestation at birth. Each unit increase of self-esteem scores was significantly associated with, on the average, almost a week greater length of gestation at birth. Use of drugs or alcohol was associated with, on the average, more than a week earlier gestation at time of delivery than women who did not report use of drugs or alcohol. Study participants with active religiosity, on the average, delivered more than a week earlier than participants without active religiosity. TennCare insurance, from the socio-demographic component, and a woman's negative view of her pregnancy, from the perceptual component, were clinically relevant variables. TennCare insurance was

related to a greater length of gestation at birth, and the perceptual component was related to a shorter length of gestation at birth. The best five variable model to explain gestational age was significant, but not highly predictive, with a press R^2 value of .03 (Figure 3).

HOPE Theory and Preterm Birth

Logistic regression analysis from NCSS was also applied to the full model of 16 independent variables to examine the relationship of socio-demographic, biophysical, psychosocial, and spiritual components and the women's own perception of her pregnancy in mid- pregnancy with preterm birth, a gestational age risk outcome. The full model included significant variables from socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components ($p = .03$), $Chi^2 = 28.16$ and $R^2 = .22$. However, a more parsimonious model was preferred with fewer variables, yet having similar sensitivity and specificity when only significant or nearly significant variables were accounted for. This simpler model was computed using stepwise logistic regression and included the psychosocial, spiritual and perceptual component. The biophysical component did not enter the reduced model. There is no formal r-squared press procedure for logistic regression. Self esteem, and the perceptual component emerged from this stepwise logistic regression procedure as significant predictors of preterm birth that were in the expected direction; greater levels of self esteem were related to a decreased incidence of preterm birth and more negative perceptions of birth were related to an increased incidence of preterm birth.

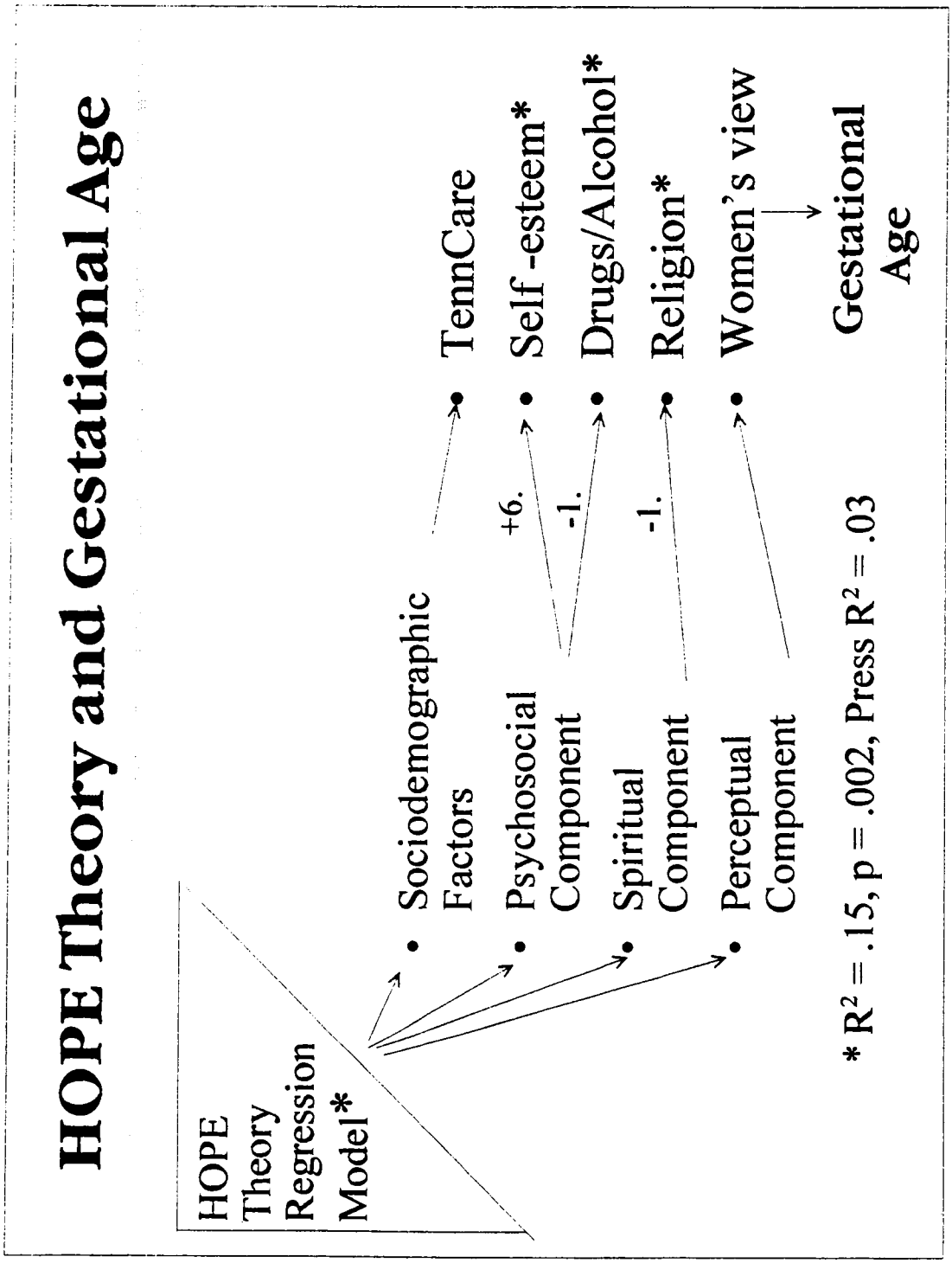


Figure 3

Hope Theory and Gestational Age

The simpler model seemed to indicate that depression, abuse and spirituality were clinically relevant, but the direction of the coefficients was suspicious. Depression and abuse were related to decreased incidence of preterm birth whereas increased spirituality scores were related to an increased incidence of preterm birth. These variables were not in the expected direction to preterm birth (Table 12). Of the eighteen women that the HOPE regression model classified as candidates for preterm birth, 22% were correctly classified (8 of the 18 high risk for preterm birth classified correctly, low sensitivity). Of the 92 women that the HOPE model classified as low risk for preterm birth, the model correctly identified 78% (86 of the 92 low risk for preterm birth classified correctly, higher specificity). The HOPE model was more predictive of women at low risk for preterm birth than it was predictive of those at high risk for preterm birth (Figure 4).

Table 12

HOPE Theory and Preterm Birth: Reduced Model

Variable	b	X^2	p
Abuse	-1.33	2.93	.09
Self-esteem	-0.134	4.90	.03*
Depression	-1.08	3.80	.051
Spirit	6.69	3.74	.053
Perception	.35	5.52	.02*

N = 118 *$p \leq .05$

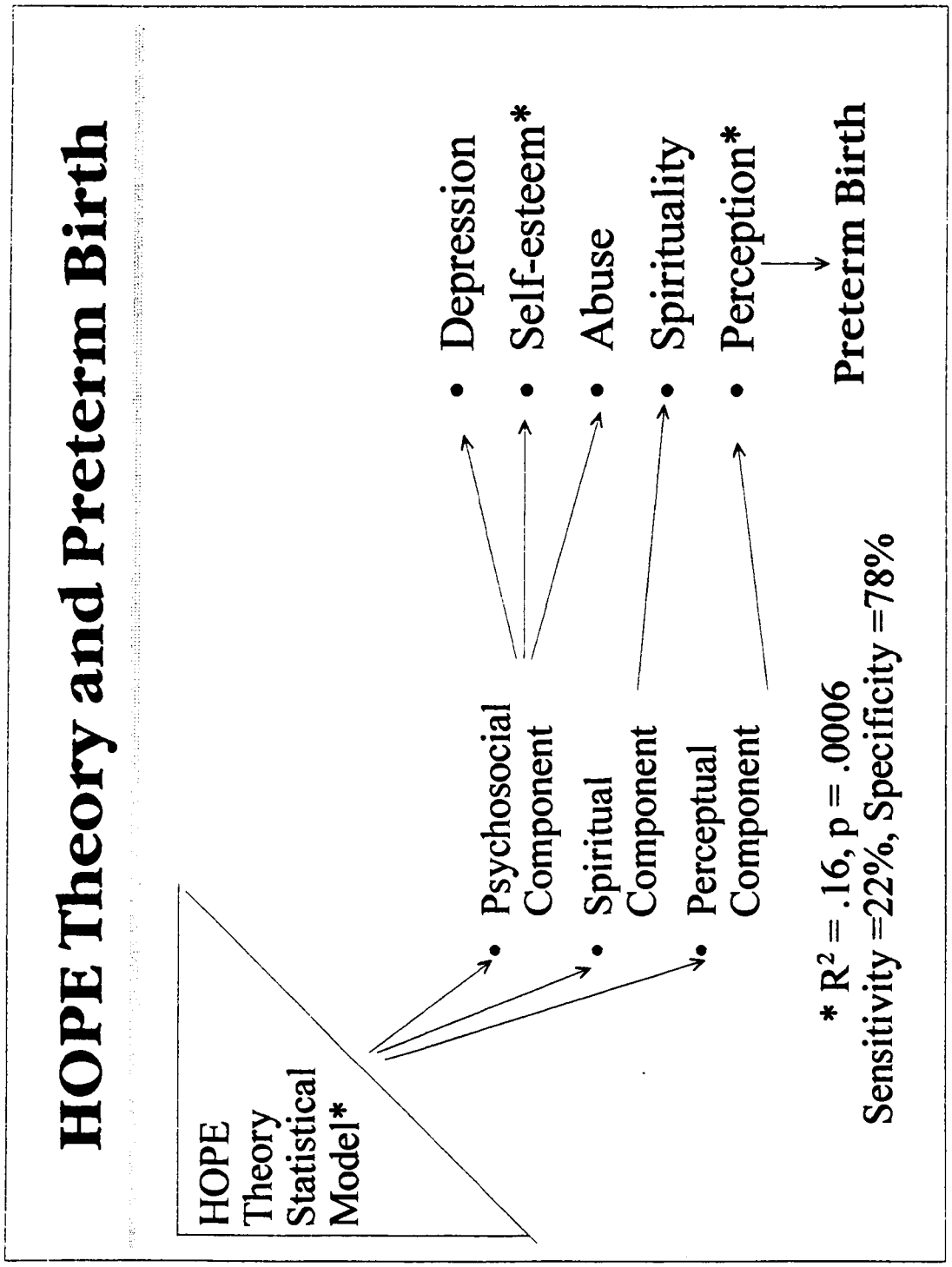


Figure 4

Hope Theory and Preterm Birth

Research Question 3: What is the relationship of socio-demographic, biophysical, psychosocial, and spiritual components and the women's own perception of her pregnancy in mid-pregnancy with APGAR score? No significant model was found for APGAR score using the *All Possible Regression* analysis.

Research Question 4: What is the relationship of socio-demographic, biophysical, psychosocial, and spiritual components and the women's own perception of her pregnancy in mid-pregnancy with unplanned cesarean birth? This question could not be answered because only two women had unplanned cesarean births.

Summary

In this sample, women who were African-American and women who had no presence of partner support were at an increased risk for delivering lower birth weight infants. Clinically relevant variables included other support, self-esteem, smoking and spirituality. Higher levels of self-esteem and spirituality were related to women delivering higher birth weight infants; whereas, smoking and other support were related to delivering lower birth weight infants. Higher self-esteem scores were also associated with a greater length of gestation at birth; whereas, use of drugs and alcohol, and high religiosity scores were associated with a shorter length of gestation at birth. TennCare Insurance and negative perceptions of the pregnancy were clinically relevant variables. TennCare was related to a greater length of gestation at birth and negative perception of the pregnancy was related to a shorter length of gestation at birth. Although the models for birth weight and gestational age were significant, they were not highly predictive.

Logistic regression analysis revealed that the full HOPE model (socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components) was significant for predicting preterm birth, however a parsimonious model was selected that had similar sensitivity and specificity to the full model. The reduced model's sensitivity was low (ability to predict those at high risk for preterm birth correctly) yet, specificity of the model was higher (ability to predict those at low risk for preterm birth correctly). Logistic regression analysis also revealed that self-esteem and the woman's own view of pregnancy were significantly related to preterm birth. Higher levels of self-esteem were associated with a decreased incidence of preterm birth; more negative views were associated with an increased incidence of preterm birth. Depression, abuse and spirituality were clinically relevant variables in the opposite direction to preterm birth than expected. There was no correlation of APGAR score to the independent variables, and because of the low incidence of unplanned cesarean birth it was inappropriate to analyze the model.

CHAPTER FIVE

DISCUSSION

The purpose of this study was to test the Holistic Obstetrical Problem Evaluation (HOPE) theory by examining the relationship of biophysical, psychosocial, spiritual, perceptual components and socio-demographic factors to low birth weight and other adverse pregnancy outcomes. A summary of expected and unexpected findings from questions posed in Chapter 4 is presented. This is followed by conclusions, a description of the limitations and strengths of this study, implications for theory, practice, education, policy and research.

The HOPE theory was tested by exploring the relationship of biophysical, psychosocial, spiritual, perceptual components and socio-demographic factors to: 1) infant birth weight; 2) gestational age and preterm birth; 3) APGAR score; and 4) unplanned cesarean birth. Although four research questions were posed, only the first two questions could be evaluated: 1) the relationship of the HOPE theory to birth weight; and 2) the relationship of the HOPE theory to gestational age and preterm birth. Analysis of question three determined that there was no relationship between the HOPE theory components and APGAR score. Question four could not be answered because there were only two unplanned cesarean births.

Question One: The Relationship of the HOPE Theory to Birth Weight

Question one examined the relationship of socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components to infant birth weight. The findings provided partial evidence to support the Holistic Obstetrical Problem Evaluation (HOPE) theory. Socio-demographic factors and the psychosocial component had a significant association with infant birth weight; whereas, the biophysical, spiritual and perceptual components did not.

African-American race was a socio-demographic factor significantly associated with delivering lower birth weight infants. African-American women delivered infants, weighing less than Anglo-American women. Although this finding is consistent with previous research, it remains a grave concern. African-American women continue to deliver low birth weight babies two times more often than Anglo-American, Hispanic or Native American women, despite adjusting for socio-demographic, biophysical and behavioral factors (Hogue & Hargrave, 1993; Hughes & Simpson, 1995). Why this is so, continues to be a complex research challenge (Copper et al, 1996).

Many single women, in this study, lived alone and reported partner support; fewer single women lived alone and reported no partner support. Single women, without partner support, were more likely to deliver infants weighing less than women with partner support. This is a new finding. Studies usually report general categories of support (Norbeck & Tilden, 1983), rather than specific categories of support (partner, mother or other support) (Norbeck & Anderson, 1989), or report general pregnancy

outcomes, rather than specific categories (birth weight or gestational age). Others discuss support as a buffer for the effect of stress on pregnancy outcomes (Norbeck, DeJoseph & Smith, 1996; Norbeck & Tilden, 1983; Rothberg & Lits, 1991). Norbeck & Anderson's (1989) study was one of few differentiating type of support and specifying birth outcomes. In their study, support from a male partner was significantly related to length of gestation, and support from their mother was significantly related to labor complications. No study was found that discussed the relationship of no presence of partner support and infant birth weight.

In this study, single and married women living alone, without support, had a greater magnitude of risk for delivering lower birth weigh babies than either single or married women with partner support. These single women, without partner support, also had greater biophysical risks, lower self-esteem, greater lifestyle risks (62% smoked and 12% used drugs or alcohol), over twice the rate of abuse, and babies that weighed over a pound less and were born a week earlier than other women in this study. This finding could be meaningful for midwives, nurse-practitioners and physicians caring for single pregnant women. In addition, current social support intervention research could include single women (or married women living alone) who have no partner support.

Several clinically relevant findings related to birth weight are in this model. Higher levels of social support were associated with lower birth weight infants which was similar to Norbeck and Anderson's (1989) findings regarding the potential for social relationships having a negative impact on pregnancy outcomes. It is possible that too

much social support that is stressful or encourages use of drugs and alcohol could have a detrimental effect.

Another clinically relevant finding was the positive relationship of higher levels of self-esteem with higher birth weight infants. In previous studies lower levels of self esteem were linked to LBW through adverse life-style risks, such as smoking, use of drugs (Copper et al, 1996), inadequate prenatal care (Harvey, 1991), and low weight gain in pregnancy (Hickey et al, 1995); however, no study was found that linked self-esteem directly to birth weight. There is an abundance of literature suggesting a direct and significant relationship of smoking to increased frequency of delivering lower birth weight babies, and/or to Intrauterine Growth Retarded (IUGR) infants (Chomitz, Cheung & Lieberman, 1995). The relationship of spirituality to birth weight also has clinical relevance. Higher levels of spirituality were associated with higher birth weight infants. Spirituality may be protective for the developing infant. Generally, greater spirituality is associated with fewer lifestyle risks (Lanig, 1994) and higher mood states in non-pregnant adults (Fehring, Brennan, Keller, 1987). No studies were found that measured the effect of spirituality on birth outcomes. Therefore, further research is needed to determine if spirituality has an indirect effect on birth weight.

Question Two:

Relationship of the HOPE Theory to Gestational Age and Preterm Birth

Question two examined the relationship of socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components to length of gestational

age at time of birth and to the occurrence of preterm birth. First, the findings for length of gestational age are described followed by the findings for preterm birth.

Gestational Age

These findings provided partial support for the HOPE theory. Psychosocial and spiritual components (self-esteem, drug and alcohol use and religiosity) were significantly related to gestational age, while socio-demographic factors, biophysical and perceptual components were not (Figure 5). Self-esteem had a positive impact on length of gestational age at birth. Higher self-esteem scores were associated with greater length of gestation at birth. This is a new and unexpected finding, because minimal research has been conducted to evaluate the role of self - esteem with pregnancy outcomes. This study provided beginning evidence that self-esteem had a positive impact on length of gestation at birth. While many research reports evaluated the effects of stress, social support, abuse and lifestyle risks on pregnancy, fewer studies described a direct relationship of self-esteem to pregnancy. More often the indirect influence of low self esteem to harmful lifestyle risks was described, such as an association of low self-esteem with smoking, alcohol and drug use, poor nutritional habits (Copper et al, 1996; Goldenberg et al, 1992), and/or failing to obtain adequate prenatal care (Harvey, 1991). Self esteem had a positive and significant effect on length of gestational age at birth, while use of drugs and alcohol, and increased religiosity scores, had a negative impact on length of gestational age at birth.

Drug and alcohol use had a negative impact on gestational age. Women who

reported use of drugs or alcohol delivered their infants more than one week earlier than women who did not report use of drugs or alcohol. Research literature concurs that moderate to heavy alcohol consumption and/ or illicit drug use in pregnancy is associated with lower gestational age at birth and low birth weight (Chomitz, Cheung & Lieberman, 1995; Copper et al, 1996; Institute of Medicine, 1985). This research replicates knowledge regarding the association of drugs and alcohol with adverse outcomes of pregnancy.

Unexpectedly, active religiosity, from the spiritual component was associated with lower gestational age at birth. This also was a new finding. Study participants with active religiosity delivered more than one week earlier than participants without active religiosity. No study was found that discussed the relationship of religious practice to length of gestation at birth. Only one study (King, Speck & Thomas, 1994) was found that reported a negative influence of religiosity to health in the general population. This study (n = 300) reported that patients who expressed strong religious beliefs at the initial hospital admission interview fared less well clinically six months later than those who did not express strong beliefs. Usually, studies (Lanig, 1994; Mullen, 1990; Oleckno & Blacconiere, 1991) reported that greater religious interest is associated with increased levels of wellness, fewer health compromising behaviors and less illness in the general population. However, health practices, codes of conduct and cultural practices within different religious faiths can effect health care practices and health outcomes differently (King, Speck & Thomas, 1994; Fonnebo, 1994).

Receiving TennCare and the perceptual component had clinically relevant relationships with length of gestational age at birth. The unexpected positive direction of TennCare has clinical relevance. TennCare, an indirect measure of poverty for this study, and managed care's form of Medicaid, had a positive, though modest influence on gestational age at birth. Unhappiness with the pregnancy, less acceptance toward pregnancy, and decreased expectations for normal birth outcomes were related to a decreased length of gestation at the birth. Sable et al (1997) also reported a similar negative direction; greater unhappiness, unwantedness and lack of acceptance of pregnancy were significantly related to an increased incidence of delivering very low birth weight babies. However they did not examine decreased expectations for a normal birth, a question derived from this midwife's clinical experience nor did they examine gestational age at birth.

Preterm Birth

Psychosocial, perceptual and spiritual components were related to preterm birth when only significant or nearly significant variables were accounted for. These included self - esteem, depression and abuse from the psychosocial component, the perceptual component and spirituality from the spiritual component. Self- esteem was negatively related to the incidence of preterm birth. Higher reported levels of self- esteem were associated with a decreased risk of delivering a preterm baby. The relationship of self-esteem with a decreased incidence of preterm birth was also a new finding that is even more important for possible future clinical interventions and research because of the high

rate of preterm birth in this study (22.7%), twice the rate of the national average (11%).

Perception of pregnancy (greater unhappiness, unwantedness and negative expectations for the birth) was also associated with a greater risk of preterm birth. This is a new finding. No study was found that reported an association of perception of pregnancy with preterm birth. Until recently the relationship of a woman's feeling toward her pregnancy received little attention. Recent studies have focused on the relationship of pregnancy wantedness, acceptance and happiness with birth weight, or transfer of the neonate to a neonatal intensive care unit (NICU), but these studies have been retrospective or lacked methodological description. This midwife added the question regarding level of positive expectations for a normal birth as one aspect of the perceptual component because of clinical experiences, wherein women who had greater worry about the birth appeared to need more interventions at birth. Sable et al's (1997) retrospective study described a significant association of unhappiness, less acceptance of the pregnancy with increased likelihood of delivery a very low birth weight infant (VLBW). Oakely (1992) reported that women's level of happiness with their pregnancy was associated with low birth weight and neonatal transfer after being labeled high risk by the provider. However, no study was found that considered level of happiness and acceptance of the pregnancy, or expectations for a normal birth and also found a relationship of the woman's perception with preterm birth. Women in this study who felt unhappy, unaccepting of the pregnancy with negative expectations toward the birth had a shorter length of gestation than women who felt happy, accepting and with positive

expectations. This raises some interesting questions, how does a woman's emotional investment or level of positive expectation affect outcomes? Would including a woman's feelings in their prenatal care reduce the magnitude of risk at birth?

The way women feel about their pregnancy may influence behaviors that in turn could influence birth outcomes. Increased insight into the woman's feelings toward her birth may allow the woman and her provider to intervene to ensure better birth outcomes. Watson (1979) described that a person has more control over health outcomes than traditionally assumed, the way we think about our health may influence our health outcomes (Watson, 1979). Further research on the impact of unwanted pregnancies, the relationship of unhappiness and negative expectations with birth outcomes is warranted.

There were several unexpected clinically relevant relationships of variables within the psychosocial and spiritual components with preterm birth. Why higher levels of depression and abuse were associated with lower levels of preterm birth and higher levels of spirituality were associated with increased frequency of preterm birth is an unknown and possibly spurious finding. However, this may be related to the high incidence of depression, abuse and the high levels of spirituality in this convenience sample. Abuse usually increases the risk for first or second trimester bleeding in pregnancy or is associated with negative lifestyle factors that could affect the length of pregnancy, such as, late entry into prenatal care, smoking and alcohol and drug use (Institute of Medicine, 1985; Parker, McFarlane, Soeken, 1994). Depression has been reported to increase the risk for preterm labor (Steer, Scholl, Hedigar & Fisher, 1992).

No studies were found that linked higher levels of spirituality with preterm birth.

The full HOPE statistical model, including socio-demographic factors, biophysical, psychosocial, spiritual and perceptual components, explained preterm birth; however, a more parsimonious model, with similar sensitivity and specificity, was preferred. Both the full and parsimonious model had low ability to predict women at high risk for preterm birth (low sensitivity), and it had higher ability to predict women at low risk for preterm birth (higher specificity). These preliminary results compared favorably to Oregon Health Sciences University (OHSU) risk assessment in pregnancy (Wall et al, 1989). In Wall's risk assessment, sensitivity (.22) and positive predictive values were low, while specificity (.79) and negative predictive value were reasonably high.

Question Three: The Relationship of the HOPE Theory to APGAR Score

The findings did not provide evidence to support a relationship of socio-demographic factors, psychosocial, spiritual and perceptual component to APGAR score. Two possible reasons for this insignificant relationship include, first, there were few low birth weight babies and very preterm babies (28 - 32 weeks) in this sample, often having low APGAR scores. A decreased variation of APGAR scores is common, especially in a homogenous sample, yet it remains as a standard obstetrical measure of infant outcomes. In addition to APGAR score, number of minutes receiving oxygen, or transfer to the Neonatal Intensive Care Unit (NICU) may have more accurately depicted infant risk status.

Question Four: The Relationship of the HOPE Theory to Unplanned Cesarean Birth

Because there were only two unplanned cesarean births in this sample it was not possible to evaluate the relationship of the HOPE theory to unplanned cesarean birth. Unplanned cesarean birth is a more accurate measure of impending adverse birth outcomes than scheduled (or planned) cesarean birth. The unplanned cesarean births were performed because of an undiagnosed breech presentation and a non-reassuring fetal heart rate pattern. There are two possible reasons for the low unplanned cesarean birth rates. First, the study sites may have effected the low unplanned cesarean rate in this study. All sites were staffed by nurse-practitioners. Physicians at the private sector site took pride in their low primary cesarean birth rate of 8%, (one physician's rate at this site is 4%, personal communication, 1999), and a total (planned and unplanned) cesarean birth rate of 15%; the national average for all cesarean birth (planned and unplanned) is 20.8% (USDHHS, 1997). In addition, the public sector site, a tertiary care center, had a highly skilled medical staff, and state of the art technology readily available to diagnose and plan for abnormal pregnancy conditions, thus reducing the frequency of unplanned cesarean birth.

Conclusions

While this study is small, new knowledge was gained regarding the relationship of socio-demographic, biophysical, psychosocial, spiritual and perceptual components with birth outcomes. The HOPE theory was partially supported with respect to birth weight, gestational age and preterm birth; it was not supported with respect to APGAR score. There was partial support for the relationship of psychosocial, spiritual and

perceptual components within the HOPE theory to birth outcomes, yet the biophysical component and factors within other components were not always related to birth outcomes.

African-American race and no partner support were related to lower birth weight infants; low self esteem, use of drugs and alcohol and high religiosity scores were associated with earlier gestation at time of delivery, and low self esteem and low perceptual scores were related to increased incidence of preterm birth. Socio-demographic factors and psychosocial components were also related to birth weight. Women who were African-American, and lacked presence of partner support were at a higher risk for delivering a lower birth weight baby. Although biophysical, spiritual and perceptual components were not related to infant birth weight in this study, replication in a larger and more diverse sample is warranted. These results are a modest contribution to what is known about the influences of African-American race and partner support with birth weight.

Psychosocial and spiritual components were related to gestational age at birth, and socio-demographic factors, and the biophysical and perceptual component were not related. Higher reported levels of self esteem were associated with increased length of gestation at birth, use of drugs and alcohol, and active religiosity were associated with decreased length of gestation at birth. The findings add to the abundance of research confirming the negative effect that use of drugs and alcohol has on gestational age. The relationship that self-esteem and active religiosity have with length of gestational age, not reported in other studies, needs to be explored further. TennCare and the perceptional

component were clinically significant variables related to gestational age.

Self-esteem from the psychosocial component and the perceptual component emerged as factors related to preterm birth. While there is beginning evidence that self-esteem is related to prenatal health practices, little is known about the effect of self-esteem on preterm birth, nor have there been any studies on the relationship of the perceptual component to preterm birth. The relationship of these components to preterm birth has more importance for this sample of women who had twice the rate of preterm birth than the national average. It could be especially important for nurse-practitioners and midwives to assess these components and intervene appropriately to help prevent preterm birth.

The HOPE theory derived from Watson (1979) provided support for a holistic approach to practice that emphasizes psychosocial, spiritual and perceptual factors. Many midwives already integrate the components of the HOPE theory into care that they deliver and positive birth outcomes are often attributed to this holistic care. Yet, assumptions cannot be made. It is necessary to scientifically evaluate a holistic philosophy and to provide support for interventions based on this scientific view. Although more attention is being given to a biopsychosocial model and birth outcomes and health outcomes generally, little attention has been given to the role of the spiritual dimension and birth outcomes. Teaching not only nurses, but the medical community and policy makers the importance of expanding beyond a biophysical perspective to a holistic view is imperative. Potent health determinants are factors over which traditional health

care has little control, money, resources and medical care are directed at the ten percent of health care with a biophysical emphasis, and ninety percent of the other is ignored (Watson, 1979). Policy leaders, midwives, and other health care providers, could join with progressive forces within managed care to initiate preventative and holistic interventions, based on research, to reduce adverse birth outcomes.

Limitations

This was a relatively small homogenous convenience sample and the analysis was primarily correlational. While this sample was representative of pregnant women from three clinical sites in East Tennessee, it cannot be generalized to the whole population. The high rates of low birth weight prevalent in Tennessee and the nation, were not reported in this sample. Although there were few African American women in the study, the number was proportional to the size of the African-American population in East Tennessee. This small homogenous sample's ability to predict was low; the effect of an independent variable had to be obvious to show significance, such as the effect of the dichotomous variables, African-American race, partner support and active religiosity. These variables were quite obvious and thus significant.

Although each participant was given a card informing them of abuse resources, they were not asked about the severity or frequency of abuse, who the perpetrator was, and/or questioned further to discover more about the level of danger the women were experiencing. A privacy statement was read to each participant before asking the drug and alcohol questions. Although no subject appeared uncomfortable, nor overtly refused

to answer, under reporting of drug and alcohol use was observed. Reports of drug and alcohol use noted on labor and delivery records were not always consistent with answers on the HOPE study interviews.

Another unanticipated interaction effect was the possible influence of prenatal care quality on birth outcome data. The positive birth outcomes in this study do not reflect the high incidence of LBW and infant mortality rates across Tennessee. Instead this may reflect influences of the high standard of prenatal care provided to women on at each study site. Nurse-practitioners were the primary providers at the health department, and the nurse-practitioners at the tertiary and private practice sites worked collaboratively with the physicians. These nurse-practitioners valued preventative care and appeared keenly aware of the client's biophysical and psychosocial needs.

Strengths

The HOPE theory was a new approach to predicting birth outcomes. This study was one of the first to test a holistic theory (HOPE) that examined the role of socio-demographic factors, biophysical, psychosocial, spiritual, and perceptual components to birth outcomes and to explore the relationship of spirituality to birth outcomes. The theory provided a structure from which the components were developed and operational definitions and instruments were selected. Newly reported findings included the relationship of no partner support with lower birth weight; lower levels of self-esteem and higher levels of religiosity with earlier gestation at birth; and lower levels of self esteem and more negative levels of perception of pregnancy with an

increased incidence of preterm birth. Replicated findings included the relationship of African-American race with lower birth weight infants and use of drugs and alcohol with earlier gestation.

The variety of sites allowed a public and private sector mix, resulting in a more diverse sample for education levels and insurance, but not race. The study was strengthened by a prospective design and use of valid and reliable empirical indicators. These instruments have been used in many other studies and they are congruent with the HOPE theory. Another strength is holistically linking variables from the biophysical, psychosocial, spiritual, perceptual components and socio-demographic data to outcomes, in order to allow a comprehensive view of pregnancy.

With the exception of a few items, the questions on the instruments were easy for the women to understand. The depression and abuse questions were short, specific, and easy to answer. Defining types of support and separating religiosity from spirituality improved the measurement of the psychosocial and spiritual component. Religiosity measurement was strengthened with a likert- scale question, two questions that measured desired and actual frequency of religious attendance. This allowed measurement of those desiring but unable to attend services. One participant faithfully watched the service on TV each Sunday, and would be considered active with these scales, though she doesn't physically attend community religious services.

The respondents expressed enjoyment related to the interviews which averaged ten minutes, therefore not tiring the women. The subjects especially liked to answer the

questions on social support and spirituality. This researcher and research assistant asked questions in a supportive non-judgemental way, which appeared to build trust with the respondents. The flash cards with response sets with smiley - faces and other visual anchors were quite helpful to those with no or low reading ability. The women's faces often lit up in the process of evaluating the support they received; this experience appeared empowering. Giving the baby photo book as an incentive worked well; often participants would immediately put their ultrasound pictures in their photo book.

Implications & Recommendations

The findings of this study are consistent with holism as described by Watson. Watson proposed that harmony of body, mind and soul leads to the highest form of health and that psychosocial, spiritual and perceptual components were believed to have a greater effect on health. Watson further described that a biophysical focus minimizes psychosocial, spiritual and perceptual components. These components may be more predictive of risk.

Practice

The Theory of HOPE derived from Watson's Theory of Human Care (1979) was inspired from this midwife's practice. Watson's (1979) carative factors can guide the clinical application of this theory. The carative factor most meaningful for the findings in this study is: *Provide for a supportive, protective, and (or) corrective mental, physical, sociocultural, and spiritual environment.* The HOPE theoretical model that emphasizes psychosocial, spiritual, perceptual components and socio-demographic factors, could be used to guide the delivery of maternal child health care.

The HOPE theory can frame an approach to patient interviews, physical health assessment, clinical interventions, patient education and referral by determining the level of disharmony the client may be experiencing. For example, if the client had no partner support, low self-esteem, or expressed negativity toward her birth, the midwife could begin to address these issues and make referrals as necessary, and if desired, integrate spiritual traditions during care. Separately, or together, these factors could affect the women's pregnancy and the infant's development.

Traditionally, the biophysical component has been emphasized more than the psychosocial during prenatal assessments. Physical care, such as blood pressure readings, weight, diet, fetal heart rates, lab values, teaching iron rich foods, lifestyle risks or exercise, became more important than psychosocial care. A holistic view, such as the HOPE theory provides, changes these priorities and allows an assessment of level of harmony or disharmony the client may be experiencing. Therefore, the biophysical component would not be minimized, but the provider would expand from a biophysical focus, incorporating psychosocial, spiritual and/or perceptual aspects of prenatal care, depending on the needs of the client.

Education

The HOPE theory could guide women's health and midwifery students interviewing, assessment, intervention and referral skills. For example, interviewing skills could be enhanced. Abuse or depression questions on traditional prenatal history forms often are absent, or are not specific enough. Students could learn to incorporate

specific questions *such as, have you been hit, slapped, kicked or otherwise physically hurt by someone this last year?* or, *are you depressed?* Learning to use the prenatal history form as a guide to ask more specific questions might increase the probability of a positive response that could be followed by further assessments and appropriate interventions. The cultural, psychosocial, spiritual and family context of pregnancy and birth could be emphasized. In addition to traditional biophysical assessment skills, nursing students could learn to evaluate more thoroughly the psychosocial, spiritual and perceptual and family context of birth and pregnancy. Pregnancy viewed through the HOPE theory provides a window of opportunity for nursing and midwifery students to have a great impact on the client and her unborn baby.

Policy

Women on TennCare had few complaints about access to insurance or prenatal care. This finding may be valuable to policy makers, advocacy groups and legislators seeking future funding of the TennCare or other Medicaid managed care programs. Further study of birth outcomes of women on Medicaid managed care alternatives, such as TennCare, compared to the outcomes of women with private insurance may provide more insight into managed care and birth outcomes in future studies.

At its core managed care is about managing risks associated with delivery of care and the costs related to those risks. As health plans have long understood and providers are increasingly coming to recognize, the effective identification and management of risk are where real changes can be brought to the system of health care. Comprehensive

prenatal care that assesses and intervenes to prevent risks from effecting birth outcomes could translate into long term human and financial cost savings (Brown, 1995; Dower et al, 1999).

Research:

Although this initial study on testing the HOPE theory may provide support for the theoretical linkage of components and outcomes, more study is required to evaluate the HOPE theory. Future research projects inspired by the HOPE study are:
1) examine the difference between abused and non-abused Appalachian women's level of substance use; 2) examine the difference between women who use drugs and alcohol and those who abstain and levels of self-esteem and spirituality; 3) compare the difference of public and private sector insurance on access to care, number of prenatal visits and birth outcomes; 4) compare the differences of religious affiliations (i.e., Baptist, Protestant, other and none), lifestyle risks, self - esteem and birth outcomes; 5) focus on the most vulnerable women in this study (i.e., no partner support, African-American, low self - esteem, increased life style risks, stressful support from others, unhappiness with the pregnancy); and 6) conduct a study to determine the relationship of the HOPE theory components with each other.

Beyond this specific study other research projects inspired by this study could include: 1) a qualitative study to examine Appalachian pregnant woman's experience of religious faith to discover more about religion and health in pregnancy;
2) a study that follows the mothers who were in this study to determine the relationship

of the HOPE theory components, birth outcomes and the incidence and length of breast feeding and/or adaptation to parenting; 3) a study to analyze type of prenatal provider (nurse-practitioner, midwife, resident or physician), prenatal site (a public or private sector), cost effectiveness, prenatal care adequacy, and birth outcomes; 4) a study to compare the two screening questions on depression with instruments such as the Beck inventory in pregnancy; and 5) further research on the effectiveness of social support intervention during prenatal care, such as the exemplar research of Norbeck et al, 1996, that provided an example of social support intervention research having great impact on birth outcomes with low income African American women identified as having low social support.

The HOPE theory could provide the rationale to develop and test a Holistic Obstetrical Problem Evaluation instrument in the future that could be incorporated as part of a prenatal history form. In future studies there may be a need to develop culturally sensitive measures, address the stress subscale reliability, and the expand the biophysical component to current and historical prenatal risk factors. For example, many subjects in this study had difficulty with the double negative questions of the self-esteem scale and the scale words, such as: *"worth," "experiences" and "morale,"*e.g. *1)You feel you're a person of "worth" 2) Shares similar "experiences" with me and 3) helps keep up my "morale."* Questions on the Spiritual Perspective Scale could be simplified for clarity, *how often do you engage in private prayer or meditation*, could be changed to *how often do you pray or meditate*? In the perceptual component: *Thinking of your pregnancy now, do you expect to have a normal birth* could be strengthened by including fearful

expectations, such as level of worry or concern about the pregnancy. Infant outcome criteria, APGAR score, specifically, could be strengthened by including objective measures such as: 1) newborn transfer to NICU; 2) meconeum staining at birth; 3) time with bag and mask ventilation; or 4) time of oxygen administration to room air. In addition more sensitive measures of intrauterine growth retardation (IUGR), defined as the 10th percentile of birth weight by gestational age, may more accurately differentiate intrauterine growth retarded infants from low birth weight babies.

An unexpected observation was the possible importance of the researchers anecdotal notes, written during the interview. Many anecdotal comments and notes were obtained which provided rich insight. For example, from the researchers notes, it appeared that women moving into the area from other geographical locations were less likely to have active religiosity scores. This observation could be explored further. The recording of an unusual statement or question the respondent made took on more meaning when reviewing poorer birth outcomes. The following story is an example of the clinical relevance of these statements. A mother in this sample responded to the last statement in the HOPE interview while waiting for her ultrasound appointment, *I expect to have a normal birth, Yes/No*? Her response was written on the side of the dichotomous answer, *No, I'm not sure why. I guess I am just a worry wort.* Although the mother had no facts at that point to substantiate her feelings; after the interview her babies high risk condition was discovered by the ultrasonographer, and she was immediately referred to a perinatologist for further care. Perhaps no one other than this woman and the PI knew what her feelings were before the baby's high risk condition was

discovered. Although she was able to carry her baby until term, and deliver normally, the baby had an APGAR score of five at five minutes and died within twenty- four hours after birth from a congenital heart defect. This type of qualitative data collection warrants further analysis.

Summary

This timely and important topic extends the boundaries of what is known about the relationship of body, mind and soul to birth outcomes, and evaluates the adequacy of the HOPE theory. Watson's holistic approach provided a way to view the phenomenon of risk in pregnancy and guided the development of the Holistic Obstetrical Problem Evaluation Theory. The results of this study provided evidence for a significant but modest relationship of socio-demographic factors, psychosocial, spiritual, and perceptual components to birth outcomes (birth weight, gestational age and preterm birth).

Socio-demographic factors and the psychosocial component were related to infant birth weight. In this sample, African-American women had an increased risk of delivering a lower birth weight infant. Lack of partner support, from the psychosocial component, was also associated with delivering a lower birth weight infant. Clinically relevant variables related to infant birth weight included other social support, self - esteem, and smoking from the psychosocial component and spirituality from the spiritual component.

Self - esteem and use of drugs and alcohol from the psychosocial component; and religiosity from the spiritual component were related to the infant's gestational age at birth. Higher levels of self-esteem were associated with a greater length of gestation at

birth, whereas use of drugs and alcohol and active religiosity were associated with a shorter length of gestation at birth. Clinically relevant variables associated with the infant's gestation at birth included TennCare from the socio-demographic factors and a woman's own view from the perceptual component. Although the full statistical model was significant to predict preterm birth, a more parsimonious statistical model was chosen wherein self esteem from the psychosocial component and the woman's own views from the perceptual component emerged as significant predictors of preterm birth. Higher levels of self-esteem were related to a decreased incidence of preterm birth and a more negative view of pregnancy was related to an increased incidence of preterm birth. Depression, abuse and spirituality were clinically relevant variables associated with preterm birth.

Testing the theory of HOPE to identify both risks and protective factors for lower birth weight and preterm babies provided an empirical basis for comprehensive prenatal care interventions that may improve birth outcomes. The findings of this study offer unique and valuable information for midwives, nurses and physicians, who work with pregnant women. This was a complex research endeavor that requires additional investigation to more fully appreciate the role that our body, mind and soul have on maternal and perinatal health.

REFERENCES

REFERENCES

Adler, R. & Hayes, M. (1990). Psychosocial factors in pregnancy and the experience of labor: A prospective study. Journal of Psychosomatics, Obstetrics, and Gynecology, 11, 47-55.

Ahlborg, G. & Bodin, L. (1991). Tobacco smoke exposure and pregnancy outcomes among working women : A prospective study at prenatal care centers in OREBRO County Sweden. American Journal Epidemiology, 133 (4), 338-347.

Alexander, G.R.& Korenbrot, C.C. (1995). In Center for the future of children, The David and Lucille Packard Foundation, The Future of Children: Low Birth Weight, 5(1), 103-120.

American Psychiatric Association (1987). Diagnostic and Statistical Manual of Mental Disorders. 3rd ed, revised. Washington, D.C.: American Psychiatric Association.

Armetta, N. & Jesse, D. (1987). Unpublished tool: Maternity Care Coding Form. Nashville, Tennessee.

Armetta, N. (1989). Measurement and risk assessment of out-of-hospital deliveries. Unpublished master's thesis. Meharry/Hubbard School of Public Health, Nashville, Tennessee.

Barnard, K. (1988). Difficult Life Circumstance Scale. Unpublished raw data. In M.A. Curry, R.A. Campbell & M. Christian (1994). Validity & Reliability testing of the prenatal psychsocial profile. Research in Nursing and Health, 17, 127-135.

Berendes, H. W., Kessell, S., & Yaffe, S. (Eds.). (1991). Advances in the prevention of low birth weight: An international symposium. Washington, DC: National Center for Education in Maternal and Child Health.

Braveman, P., Egerter, S. Edmonston, F., & Verdon, M. (1995). Racial/ethnic differences in the likelihood of cesarean delivery, California. American Journal Public Health, 85(5), 625-630.

Brown, M.A. (1986). Social support during pregnancy: A unidimensional or multidimensional construct? Nursing Research, 35, 4-9.

Brown, S. (1995). Risk-Management System Aids Prenatal Care. Ob.Gyn.News, 30 (18), 3.

Brown, S. A. & Grimes, D. E. (1995). A meta-analysis of nurse-practitioners and nurse-midwives in primary care. Nursing Research, 44 (6), 332-339.

Bullock, L.F. & McFarlane, J. (1989). Higher prevalence of low birth weight infants born to battered women. American Journal of Nursing, 89, 1153-1155.

Carson, V., & Green, H. (1992). Spiritual well-being: A predictor of hardiness in patients with acquired immunodeficiency syndrome. Journal of Professional Nursing, 8(4), 209-220.

Carson, V., Soeken, K., & Grionnon, P. (1988). Hope and its relationship to spiritual well being. Journal of Psychology and Theology, 16, 159-167.

Center for the future of children, The David and Lucille Packard Foundation (1995). The Future of Children: Low Birth Weight, 5(1).

Chalmers, B. (1983). Psychological factors and obstetric complications. Psychological Medicine, 13, 333-339.

Chochinov, H.M., Wilson, K. G., Enns, M., & Lander, S. (1997). "Are you Depressed?" Screening for Depression in the Terminally Ill. American Journal of Psychiatry, 154 (5), 674-1007.

Chomitz,V.R., Cheung, L.W.Y. & Lieberman, E. (1995).The role of lifestyle in preventing low birth weight. In Center for the future of children. The Future of Children: Foundation.

Foundation.

Copper, R. L., Goldenberg, R., Das, A., Elder, N., Swain, M., Norman, G. Ramsey, R., Cotroneo, P, Collins, B., Johnson, F., Jones, P. & Meier, A., (1996). The preterm prediction study: maternal stress is associated with spontaneous preterm birth at less than thirty-five weeks' gestation. American Journal Obstetrics & Gynecology,175, 1286-92.

Corbin, J. (1987). Women's perceptions and management of a pregnancy complicated by chronic illness. Healthcare for Women International, 8, 317-337.

Creasy, R., Gummer, B., & Liggins, G. (1980). Obstetrics and Gynecology, 55, 692-695.

Culpepper, L.C. (1990). Exercise during pregnancy. In I. R. Merkatz & J. E. Thompson (eds.), New Perspectives in Prenatal Care, (pp. 193-210). New York: Elsevier.

Curry, M.A.(1998). The interrelationships between abuse, substance use and psychosocial stress during pregnancy. JOGNN, 27(6), 692-699.

Curry, M.A. (1997). Biopsychosocial model to predict low birth weight and pregnancy outcomes. (National Institute for Nursing Research, R01 NR02696).

Curry, M. A., Burton, D., & Fields, J. (1998). The prenatal psychosocial profile: A research and clinical tool. Research in Nursing & Health, 21, 211-219.

Curry, M.A., Campbell, R., & Christian, M. (1994). Validity and reliability testing of the prenatal psychosocial profile. Research in Nursing & Health, 17, 127-135.

Dossey, B. M., Keegan, L., Guzzetta, C., & Koekmeier, L. (1995). Holistic nursing. Gaithersburg, MD: Aspen.

Dower, C. M., Miller J. E. , O'Neil, E. H. & the Taskforce on Midwifery (1999). Charting a course for the 21st century: The future of midwifery. San Francisco, Ca: Pew Health Professions Commission & The UCSF Center For the Health Professions.

Eisner, V., Brezie, J.V., Pratt, M.W. & Hexter, A.C. 1979. The risk of low birth weight. American Journal of Public Health 69 887-893.

Emerson, R. N. (1982). Essay on nature. In L. Ziff (Ed.), Selected Essays. Middlesex, England: Penguin.

Ernest, J., Michielutte, R., Meis, P., Moore, M., & Sharp, P. (1988). Identification of women at high risk for preterm-low-birth weight. Preventative Medicine, 17(1), 60-72.

Fehring, R., Brennan, P., & Keller, M. (1987). Psychological and spiritual well-being in college students. Research in Nursing & Health, 10, 391-398.

Ferveira, N. V. (1993). The relationship of prenatal care and social support to infant birth weight among urban Mexican American women. Unpublished dissertation, Oregon Health Science University, Portland.

Fiscella, K. (1995). Does prenatal care improve birth outcomes? A critical review. Obstetrics and Gynecology. 85, 468-479.

Fischler, N. R., & Harvey, S. M. (1995). Setting and provider of prenatal care: Association with pregnancy outcomes among low income women. Health Care for Women International, 16, 309-321.

Fonnebo, V. (1994). The healthy Seventh-Day Adventist lifestyle: what is the Norwegian experience? American Journal Clinical Nutrition. 59, (5 suppl), 1124S-

1129S.

Freda, M., Anderson, H., Damus, K., Poust, D., Brustman, L., & Merkattz, I. (1990). Lifestyle modification as an intervention for inner city women at risk for preterm birth. Journal of Advanced Nursing, 15(3), 364-72.

Goldenberg R., & Andrews, W. (1996). Editorial: Intrauterine infection and why preterm prevention programs have failed. American Journal of Public Health, 86(6), 781-783.

Goldenberg, R., Patterson, E. T., & Freese, M.P.(1992) Maternal Demographic, situational and psychosocial factors and their relationship to enrollment in prenatal care: A review of the literature. Women and Health,19 (2/3), 133-151.

Goepfert, A. R., Goldenberg, R. L. (1996). Prediction of prematurity. Current Opinion: Obstetrics and Gynecology,8 (6), 417- 427.

Goodwin, J., Dunn, J., & Thomas, B. (1969). Antepartum identification of the fetus at risk. Canadian Medical Association Journal, 101, 57-67.

Grimes, L., Mehl, L., McRae, T., & Peterson, G. (1983). Phenomenological risk screening for childbirth: Successful prospective differentiation of risk for medically low-risk mothers. Journal of Nurse Midwifery, 28(5), 27-30.

Hamilton, M.A. (1959). The assessment of anxiety scales by rating. British Medical Journal, 35, 50-54.

Harlan, M. (1985). Holistic prenatal screening. Unpublished master's thesis, University of Tennessee, Knoxville.

Harvey, S.M. (1991). A comprehensive prenatal care program for low-income women in Lane County, Oregon: The impact on pregnancy outcomes, hospital costs and barriers to prenatal care. Unpublished grant report. Eugene, OR: University of Oregon.

Hebel, J., Nowicki, P., & Sexton, M. (1985). The effect of anti smoking intervention during pregnancy: An assessment of interaction with maternal characteristics. American Journal of Epidemiology, 122(1), 135-48.

Herrera, J.A., Hurtado, H., & Caceres, D.R. (1992). Antepartum biopsychosocial risk and perinatal outcome. Family Practice Research, 12 (4), 391-399.

Herrera, J., Salmeron, B, & Hurtado, H. (1997). Prenatal biopsychosocial risk assessment and low birth weight. Social Science and Medicine, 44 (8), 1107-1114.

Hickey, C., Cliver, S., Goldenberg, R., McNeal, S., Hoffman, H. (1995). Relationship of psychosocial status to low prenatal weight gain among nonobese black and white women delivering at term. Obstetrics and Gynecology, 86 (2), 177-183.

Hintz, J. (1999). Number Cruncher Statistical Systems (NCSS), Kaysville, Utah.

Hobel, C. J. (1982). Identification of the patient at risk. In R. J. Bolognese, R. H. Schwarz, & J. Schneider (Eds.), Perinatal medicine, management of the high risk fetus and neonate (2nd ed.). Baltimore, MD: Williams and Wilkins.

Hobel, C., Hyuarinen, M., & Okada, D. (1973). Prenatal and intrapartum high-risk screening: Prediction of the high risk neonate. American Journal of Obstetrics and Gynecology, 117, 1-9.

Hobel, C. J., Youkeles, L., & Forsythe, A. (1979). Prenatal and intrapartum high risk screening. American Journal Obstetrics and Gynecology, 135(8), 1051-1056.

Hogue, C. & Hargraves, M. (1993). Class, race and infant mortality in the United States. American Journal of Public Health, 83(1), 9-11.

Hoover-Dempsey, K., & Simpkins, D. (1982). The Tennessee Psychological Risk Screening Tool: Final report. Center for Community Studies. Nashville, TN: George Peabody College of Vanderbilt University, The John Kennedy Center for Research on Education and Human Development.

Hughes, D. & Simpson, L. (1995). The role of social change in preventing low birth weight. In The future of children,5(1), 87-102.

Hungelman, J. Kenkel-Rossi, E,; Klassen, L; Stottenwerk, R. (1989). Jarel Spiritual Well-Being Scale. Marquette University College of Nursing, Milwaukee, Wisconsin.

Institute of Medicine (1985). Preventing low birth weight. Washington, DC: National Academy Press.

Istvan, J. (1986). Stress, anxiety, and birth outcomes: A critical review of the evidence. Psychological Bulletin, 100, 331-348.

Jack, B. W., & Culpepper, L. (1991). Preconception care. The Journal of Family Practice, 32, 306-315.

Jesse, E. (1988). Reliability and validity of the Holistic Antepartal Risk Assessment Tool. Unpublished master's thesis project, Vanderbilt University School of Nursing, Nashville, TN.

Kalb, K. (1990). The gift: Applying Newman's theory of health in nursing practice. In M. Parker (Ed.), Nursing theories in practice. New York: National League for Nursing.

Kanner, A., Coyne, J., Schaefer, C., & Lazarus, R. (1981). Comparison of two modes of stress measurement: Daily hassles and uplifts versus major life events. Journal of Behavioral Medicine, 4, 1-39.

Kelly, R., Acheson, L. S., & Zyzanski, S. J. (1988). Comparison of three prenatal risk scores in a series of low risk pregnancies. Family Medicine, 20(2), 122-127.

King, M., Speck, P, Thomas, A. (1994). Spiritual and religious beliefs in acute illness- Is this a feasible area for study? Social Science and Medicine, 38 (4), 631-636.

Kids Count: Data book. (1994, 1995, 1997). Washington, DC: Center for Study of Social Policy.

Koenig, H., Smiley, M., & Gonzales, J. (1988). Religion, health, and aging. New York: Greenwood Press.

Lanig, H. (1994). Lifestyle and morbidity among Blacks. ABNF - Journal, 5 (1), 15-21.

Landis, B. J. (1996). Uncertainty: Spiritual well being and psychological adjustment to chronic illness. Issues in Mental Health Nursing, 17, 217-231., E. (1986).

Lederman, R. P. , Lederman, E., Work, B. A., & McCann, D. S. (1979). Relationship of psychological factors in pregnancy to progress in labor. Nursing Research, 28, 94-97.

Levin, J. S. & Vanderpool, H. Y. (1987). Is frequent religious attendance really conducive to better health?: Toward an epidemiology of religion. Social Science & Medicine, 24(7), 589-600.

Lia-Hoagberg, B., Rode, P., Skovholt, C. J., Oberg, C. N., Berg, C., Mullett, S., & Thomas, C. (1990). Barriers and motivators to prenatal care among low income women. Social Science and Medicine, 30. 4.

Lia-Hoagberg, B., Knoll, K., Swaney, S., Carlson, G., & Mullett, S. (1988). Relationship of street drug use, hospitalization, and psychosocial factors to low birth weight among low-income women. Birth, 15 (1), 8-13.

Lobel, M., Dunkel-Schetter, C., & Scrimshaw, S.C.M. (1992). Prenatal maternal stress and prematurity: A prospective study of socioeconomically disadvantaged women. Health Psychology, 11, 32-40.

Lobel, M. (1994). Conceptualizations, measurement, and effects of prenatal maternal stress on birth outcomes. Journal of Behavioral Medicine, 17, 220-272.

London, K., Peterson, L., & Piccinino, L. (1995). The national survey of family growth: principal source of statistics on unintended pregnancy: Supplement to Chapter 2. In S. Brown and L.Eisenberg, The Best Intentions : Unintended Pregnancy and the Well-Being of Children and Families. Washington, D. C. :National Academy Press.

Loyer, R. (1995). Spiritualization in nursing. Australian Journal of Holistic Nursing, 2(1), 31-7.

Mahoney, J., Drinka, T.J.K., Abler, R., Gunter-Hunt, G., Matthews, C., Gravenstein, S., & Carnes, M. (1994). Screening for depression: Single question versus GDS. Journal American Geriatric Society, 42, 1006-1008.

March of Dimes (1999). Perinatal profile: Statistics for monitoring state maternal and infant health. Perinatal Data Center.

Margana, A., & Clark, N. (1995). Examining a paradox: Does religiosity contribute to positive birth outcomes in Mexican American populations. Health Education Quarterly, 22(1), 96-109.

Marchione, J. (1986). Pattern as methodology for assessing family health: Newman's Theory of Health. In P. Winstead-Fry (Ed.). Case studies in nursing theory.

NY: National League for Nursing.

Maslow, A.H. (1943). A theory of human motivation. Psychological Review, 50 (370).

Mawn, B., & Bradley, J. (1993). Standards of care for high-risk prenatal clients: The community nurse case management approach. Public Health Nursing, 10(2), 78-88.

McCormack, M.C. (1985). The contribution of low birth weight to infant mortality and childhood morbidity. New England Journal of Medicine, 312. 82-90.

McFarlane, J., Parker, B; Soeken, K, & Bullock, L.(1992). Assessing for abuse during pregnancy. JAMA, 267 (2), 3176-3178.

McGregor, J.A., French, J.I., Richter, R., Franko-Buff, A., Johnson, A., Hillier,S.; Judson, F.N. & Todd, J.K. (1990). Antenatal microbiologic and maternal risk factors associated with prematurity. American Journal Obstetrics and Gynecology, 163, (5) part. 1 1465-1471.+

McFarlane, J., Parker, B., & Soeken, K.(1996). Abuse during pregnancy: associations with maternal health and infant birth weight. Nursing Research, 45,(1), 37-41.

McFarlane, J., Parker, B, Soeken, K., & Bullock, L. (1992). Assessing for abuse during pregnancy. JAMA, 267(23), 3176-3178.

Mehl, L. E. (1981). Psychophysiological risk screening. In G. Peterson (Ed.), Birthing normally: A personal growth approach to childbirth. Berkeley, CA: Mind Body Press.

Meis, P., Ernest, J., Moore, M., Michielutte, R., Sharp, P., & Brescher, P. (1987). Regional program for prevention premature birth in Northwestern North Carolina. American Journal Obstetrics & Gynecology, 15(3), 550-6.

Melnikow, J, Alemagno, S.A., Rottman, C.,& Zyzanski, S.J. (1991). Characteristics of inner-city women giving birth with little or no prenatal care: a case-control study. The Journal of Family Practice. 32 (3). 283-288.

Molfese, V.J., Bricker, M.C., Manion, L.G., Beadnell, B., Yapel, K. & Moires, K.A. (1987). Anxiety, depression and stress in pregnancy: A multivariate model of intrapartum risks and pregnancy outcomes. Journal of Psychosomatic Obstetrics and Gynecology, 7, 77-92.

Morgan, M. (1996).Prenatal care of African-American women in selected USA and rural cultural contexts. Journal of Transcultural Nursing, 7 (2), 3-9.

Morrison, J. C. (1997) The fetal fibronectin test. Presentation at Vanderbilt High Risk Obstetrics Seminar Dec. 5, Nashville, Tennessee.

Mullen, K. (1990). Religion and health: A review of the literature. International Journal of Sociology and Social Policy, 10(1), 85-96.

Newton, R. W. & Hunt, L. (1984). Psychosocial stress in pregnancy and its relation to low birth weight. British Medical Journal, 288, 1191-3.

Newton, R. W., Webster, P.A.L., Binn, P. S., Maskrey, N. & Phillips, A. B. (1979). Psychosocial stress in pregnancy and its relation to the onset of premature labor. British Medical Journal, 2, 411-413.

Norbeck, J., Lindsey, A.M., & Carrieri, V. L. (1981). The development of an instrument to measure social support. Nursing Research, 30, 264-269.

Norbeck, J., & Anderson, N. (1989). Psychosocial predictors of pregnancy outcomes in low income Black, Hispanic and White women. Nursing Research, 38, 207-209.

Norbeck, J.S., DeJoseph, J.F.,& Smith, R.T. (1996). A randomized trial of an empirically derived social support intervention to prevent low birth weight among African American women. Social Science and Medicine, 6, 947-954.

Norbeck, J., & Tilden, V. (1983). Life stress, social support, and emotional disequilibrium in complications of pregnancy: A prospective, multivariate study. Journal of Health and Social Behavior, 24, 30-46.

Nordentoft, M. Lou, H.C. Hansen, D., Nim, J., Pyrds, O., Rubin, P. & Hemmingsen, R. (1996). Intrauterine growth retardaton and premature delivery: The influence of maternal smoking and psychosocial factors. American Journal of Public Health, 86, 347-354.

Nuckolls, K. B., Cassel, J., & Kaplan, B. H. (1972). Psychosocial assets, life crisis,and the prognosis of pregnancy. American Journal of Epidemiology, 95, 431-441.

Oakley, A. (1992). Social support and motherhood. Oxford UK: Blackwell.

Ogrocki, P.K. (1994). Stress moderating and stress mediating effects of health behaviors on medical complications on pregnancy (Doctoral dissertation, Kent State University, 1994). Dissertation Abstracts International, AA19534504.

Oleckno,W. & Blacconiere, M. (1991). Relationship of religiosity to wellness and other health-related behaviors and outcomes. Psychological Report, 68(3 Pt.1), 819-26.

Pagel, M.D., Smilkstein, G., Regen, H., & Montano, D. (1990). Psychosocial influences on new born outcomes: A controlled prospective study. Social Science and Medicine, 30(5), 597603.

Paneth, N. C. (1995). The problem of low birth weight in. In: David & Lucille Packard Foundation, The Future of Children, Low Birth Weight, 5(1), 19-33.

Papiernick, E., Bouyer, J., & Dreyfus, J. (1985). Prevention of preterm births: A perinatal study in Hagnenau, France. Pediatrics, 76, 154.

Parker, B., McFarlane, J., & Soeken, K. (1994). Abuse during pregnancy: effects on maternal complications and birth weight in adult and teenage women. Obstetrics & Gynecology. 84 (3), 323-328.

Post-White, J., Ceronsky, C., Kreitzer, M, Nickelson, K., Drew, D., Mackey, K, Koopmeiners, L., & Gutknecht, S. (1996). Oncology Nursing Forum, 23 (10), 1571-79

Reed, P.G. (1986). Spiritual Perspectives Scale. Unpublished instrument, Arizona State University.

Repke, J. T. (1995). Intrapartum obstetrics. New York: Churchhill Livingston.

Roberts, J. (1996). The presidents pen. The challenge: preserving midwifery. Quickening,27 (6) , 3.

Rosenberg, M. (1965). Society and the adolescent self image. NY: Princeton University Press.

Rothberg, A. D., & Lits, B. (1991). Psychosocial support for maternal stress in pregnancy: effect of birth weight. American Journal Obstetrics and Gynecology, 165 (2), 403-407.

Rutter, D. R., & Quine, L. (1990). Inequalities in pregnancy outcome: A review of psychsocial and behavioral mediators. Social Science and Medicine, 30, 553-568.

Ruzek, S. C. (1993). Toward a more inclusive model of women's health. American Journal of Public Health, 83(1), 6-8.

Sable, M., Spencer, J., Stockbauer, J.W., Schramm, W. F., Howell, V., & Herman A. (1997). Pregnancy wantedness and adverse pregnancy outcomes: Differences by race and Medicaid status. Family Planning Perspectives, 29 (2), 77-81.

Selwyn, B. J. (1990). The accuracy of obstetric risk assessment instruments for predicting mortality, low birth weight and preterm birth. In I. Merkatz, J. Thompson, P. Mullen, & R. Goldenberg (Eds.), New perspectives on prenatal care. New York: Elsener.

Sherwen, L., & Mele, N. (1984). Assessing and identifying the high risk pregnancy: A holistic approach. Topics in Clinical Nursing, 8(1), 33-44.

Simmons, H. (1996). Interview cited in Roberts, J. The challenge: preserving midwifery. Quickening, 27(6), 3.

Shiono, P., & Behrman, R., Low birth weight: Analysis & Recommendations (1995). In Center for the future of children, The David and Lucille Packard Foundation (1995). The Future of Children: Low Birth Weight, 5(1), 4-18.

Simpkin, P. (1986). Stress, pain and catechalamines in labor: Part I. A review. Birth, 13(4), 227-233.

Smilkstein, G. (1986). Psychosocial risk assessment in clinical medicine. The Journal of Family Practice, 22(6), 495-496.

Smucker, C. (1993). The wonder of meaning: A phenomenological understanding of spiritual distress. Doctoral dissertation. University of Tennessee-Knoxville.

Sokol, R. J., Rosen, M. G., Stojkov, J., & Chik, L. (1977). Clinical application of high-risk scoring on an obstetric service. Journal Obstetrics and Gynecology, 128, 652.

Spitzer, R.L., Endicott., Robins, E. (1978). Research diagnostic criteria. Archives General Psyschiatry, 35, 773-782.

Steer, R.A., Scholl, T. O., Hediger, M.L., & Fischer, R. L.(1992). Self-reported depression and negative pregnancy outcomes. Journal Clinical Epidemiology, 45, 1093-1099.

Stein, A., Campbell, E.A., Day, A., McPherson, K., & Cooper, P.J. (1987). Social adversity, low birth weight, and preterm delivery. British Medical Journal, 295, 291-293.

Tennessee Department of Health (1990, 1992, 1994). Vital Statistics Department. Nashville, Tennessee.

U. S. Bureau of the Census. (1996). Money income in the United States in 1995. Current Population Reports. Series P60-193, U.S. Government Printing Office, Washington, D.C. September, Table 9.

U.S. Department of Health and Human Services (1996). Healthy People 2000: Mid-course Review and 1995 revisions. Washington, DC: U.S.Government Printing Office.

U. S. Department of Health and Human Services (1997). Center For Disease Control: Monthly Vital Statistical Report,45(11).

U. S. General Accounting Office (1987). Prenatal care: Medicaid recipients and uninsured women obtain insufficient care: Report to the sub committee on human resources and intergovernmental relations:Washington,DC.

Ventura, S.J., Martin, J.A., Curtin, S.C., & Mathews, M. S.(1997). Report of Final Natality Statistics, 1995. Monthly vital statistics report; 45 (11), supp2. Hyattsville, Maryland: National Center for Health Statistics.

Wadhwa, P.D., Sandman, C.A., Porto, M., Dunkel-Schetter, C., & Garite, T.J. (1993). the association between prenatal stress and infant birth weight and gestational age at birth: A prospective investigation. American Journal of Obstetrics and Gynecology,169, 858-865.

Wall, E. S., Sinclair, A., Clark, A., Nelson, J., & Toffler, N. (1989). The relationship between assessed obstetric risk and maternal-perinatal outcome. The Journal of Family Practice, 28(1), 35-40.

Wall, E. M. (1988). A review of obstetric risk scoring systems. Journal of Family Practice, 27, 163.

Watson, J. (1985). The philosophy and science of caring. Boulder, CO: Associated University Press.

Watson, J. (1979). Nursing: The philosophy and science of caring. Boston: Little, Brown.

Watson, J. (1985). Nursing: Human science and human care. Norwalk, CT: Appleton-Century Crofts.

Watson, J. (1989). Watson's philosophy and theory of human caring in nursing. In J. P. Riehl-Sisca, Conceptual models for nursing practice (3rd ed., pp. 219-236). Norwalk, CT: Appleton & Lange.

Webster, R. G. (1994). The buffering effects of social support on psychological states and obstetrical outcomes in pregnancy. (Doctoral dissertation, Simon Fraser University, University of British Columbia, Canada, 1994). Dissertation Abstracts International, AA1NN06854.

Wittkower, E. E., & Warnes, H. (1977). Psychosomatic Medicine. New York: Harper & Row.

Wolff, P., & Hunt, J. (1991). Nursing in the nineties: The holistic nursing caring process. Journal of Holistic Nursing, 9(2), 3-21.

Wolf, R. (1966). The measurement of environments. In A. Anastasi (Ed.), Testing Problems in Perspective. Washington, D. C.: American Council on Education.

Woodward, K. L. (1997). More chicken soup for Barnes & Noble. Put soul on the cover and the book will sell. Newsweek, Jan. 13.

World Health Organization, Expert Committee on Maternal and Child Health (1950). Public health aspect of low birth weight. WHO Technical Report Series, 27, Geneva, Switzerland: WHO.

Zimmer-Gembeck, M.J., & Helfand, M. (1996). Low birth weight in a public prenatal care program: Behavioral and psychosocial risk factors and psychosocial intervention. Social Science & Medicine, 43 (2), 187-197.

APPENDICES

APPENDIX A

SOCIO-DEMOGRAPHIC MEASURE

Code#_____

Appendix A
Socio-Demographic Component

A.1 What is your partner status? (Interview)
___Married living with your partner
___Married living alone
___Single living with partner
___Single living alone
___Widowed living alone

A.2 Do you have health coverage (insurance) for this pregnancy? (Interview)
If so, please check one:
___Private insurance
___TennCare insurance
___TriCare/Champus
___Medicare
___Veteran
___None

A.3 Record: Weeks of gestation at first visit_____. PNR
(Add to previous questions.)

A. 4 Total number of pregnancies (gravida)_____. PNR

A. 5 Total number of deliveries (live and stillborn)_____. PNR

A. 6 Best estimate of the due date? EDC_____Weeks of gestation at time of interview_____

A.7. Barriers to Access/Prenatal Care:

How much of a problem did you have finding a prenatal care provider?
_____No problem _____Problem _____Moderate problem _____Severe problem

Check all the reasons for the difficulty that apply to you:
___Transportation
___Unable to find a doctor or nurse practitioner or midwife who took my insurance
___Child-care difficulties
___Insurance problems
___Life stresses/issues
___Other

A.8 Total number of prenatal visits _____(PNR).
A.9 How much education have you completed_____ (GED=12 years)-PNR/BMG
A.10 Did you drop out of high school_____? PNR/BMG
A.11 What is your race_____? PNR/BMG

Total 5 socio-economic variables bold, not included on Bowman Gray Tool. Questions need to ask of subject, not on chart. If PNR behind the question, information can be obtained from the Prenatal Record.

APPENDIX B

BIOPHYSICAL MEASURE

Code#_____

Appendix B
Biophysical Component

Circle each risk factor noted in the chart.

Bowman Gray School of Medicine Screening for Low Birth Weight*

Risk Factor	Variable Weight
High school drop-out	1
<16 years old	4
16-19 years old	1
<100 pounds	3
>30-min. commute to work	**1**
Smokes >10 cigarettes a day or uses snuff	calculated separately
Two or more abortions <14 weeks	2
One or more second-trimester abortions	1
Premature delivery (< 37 weeks gestation) or birth weight <2500 gms (5lb 7oz)	7
Two or more previous still births/neonatal deaths	4
<1 year since last birth	3
Cervical Conization (Ask if they have had a previous abnormal pap with surgery to their cx)	1
Pyelonephritis or **>3 urinary tract infections**	1
Uterine anomaly (abnormally formed uterus)(except myoma) or DES exposure if born before 1970 (ask if mother took the drug DES while pregnant with them if they were born before 1970)	**10**
History of placenta previa or abruptio	2
Race	calculated separately
Total score	___ (range 0-41)

*Ernst et al. (1988)

(Highlighted questions not included on patient record; would need to be asked additionally; all the

APPENDIX C

PSYCHOSOCIAL MEASURE

Code#_____

Appendix C
Psychosocial Component

Prenatal Psychosocial Profile (PPP)*

C.1 Assessment of Stress (PPP)

Ask women to what extent the following factors are current stressors/hassles. Circle the number corresponding to the appropriate response.

These next questions are concerned to what extent the following factor are a current stressor or hassle for you (show cards).

To what extent are (READ CHOICE) a current stressor/hassle for you?	No Stress 1	Some Stress 2	Moderate Stress 3	Severe Stress 4
Financial worries (e.g., food, shelter, health care, transportation)	1	2	3	4
Other money worries (e.g., bills, etc.)	1	2	3	4
Problems related to family (partner, children, etc.)	1	2	3	4
Having to move, either recently or in the future	1	2	3	4
Recent loss of a loved one	1	2	3	4
Current pregnancy	1	2	3	4
Current abuse - sexual, emotional, or physical	1	2	3	4
Problems with alcohol and/or drugs	1	2	3	4
Work problems (e.g., being laid off, etc.)	1	2	3	4
Problems related to friends	1	2	3	4
Feeling generally "overloaded"	1	2	3	4

*Curry, Campbell, & Christian (1994)

Code#_____

C.2 Assessment of Partner Support

This next set of questions asks how satisfied you are with the amount of support you receive from your partner and/or other people.

First of all, do you have a partner?

- ☐ No (Ask only about support from others.)
- ☐ Yes

I will read you a list of statements describing types of support. On a scale of 1 to 6, with 1 being very dissatisfied and 6 being very satisfied, I want you to tell me how satisfied you are with the support you receive from (your partner/other people). The first time I will be talking about your partner then I will read the same questions talking about your other support people or person.

	Partner						Other People					
	Very Dissatisfied					Very Satisfied	Very Dissatisfied					Very Satisfied
Shares similar experiences with me	1	2	3	4	5	6	1	2	3	4	5	6
Helps keep up my morale	1	2	3	4	5	6	1	2	3	4	5	6
Helps me out when I'm in a pinch	1	2	3	4	5	6	1	2	3	4	5	6
Shows interest in my daily activities and problems	1	2	3	4	5	6	1	2	3	4	5	6
Goes out of his/her way to do special or thoughtful things for me	1	2	3	4	5	6	1	2	3	4	5	6
Allows me to talk about things that are very personal and private	1	2	3	4	5	6	1	2	3	4	5	6
Lets me know I am appreciated for the things I do for him/her	1	2	3	4	5	6	1	2	3	4	5	6
Tolerates my ups and downs and unusual behaviors	1	2	3	4	5	6	1	2	3	4	5	6
Takes me seriously when I have concerns	1	2	3	4	5	6	1	2	3	4	5	6
Says things that make my situation clearer and easier to understand	1	2	3	4	5	6	1	2	3	4	5	6
Lets me know that he/she will be around if I need assistance	1	2	3	4	5	6	1	2	3	4	5	6

Appendix C
Psychosocial Component

Code#_____

C.3 Assessment of Self-Esteem (PPP)

We all have some kind of "picture" of ourselves we carry with us. I'm going to read you a list of statements that people have used to describe themselves. I would like you to tell me how much you agree or disagree that this statement describes yourself. 1 means you strongly agree and 4 strongly disagree.

	Strongly Agree	Agree	Disagree	Strongly Disagree
Feel that you're a person of worth, at least on an equal basis with others	1	2	3	4
Feel that you have a number of good qualities	1	2	3	4
All in all, feel that you are a failure	1	2	3	4
Feel that you are able to do things as well as most other people	1	2	3	4
Feel that you do not have much to be proud of	1	2	3	4
Take a positive attitude toward yourself	1	2	3	4
On the whole, feel satisfied with yourself	1	2	3	4
Wish you could have more respect for yourself	1	2	3	4
Feel useless at times	1	2	3	4
At times think you are no good at all	1	2	3	4
Feel as though you have control over your life	1	2	3	4

C.4 Depression Screen

Do you often feel sad or depressed? ____ Yes ____ No

Have you had a recent loss of interest in pleasurable activities? ____ Yes ____ No

Appendix C
Psychosocial Component

Code#_____

C.5 Lifestyle and Habits Survey

These questions ask about your intake of tobacco, alcohol, and drugs. Remember, your answers are confidential and will not go into your medical record or be released.

How much do you smoke these days?

- ☐ None
- ☐ 1-9 cigarettes a day
- ☐ 10-20 cigarettes a day
- ☐ More than a pack a day

How much marijuana do you use these days?

- ☐ None
- ☐ Less than 1 joint a week
- ☐ 1-5 joints a week
- ☐ 6-10 joints a week
- ☐ More than 10 joints a week

How much beer, wine, or hard liquor do you drink these days?
(Note: one ounce - one beer = one drink = one glass of wine)

- ☐ None
- ☐ Less than 1 ounce a day
- ☐ 1 ounce a day
- ☐ 2 ounces a day
- ☐ 3 ounces a day
- ☐ More than 3 ounces a day

How often do you use hard drugs (cocaine, heroin, speed, etc.) these days?

- ☐ Never
- ☐ Less than once a week
- ☐ 1-3 times a week
- ☐ 4-6 times a week
- ☐ More than 6 times a week

Appendix C
Psychosocial Component

Code#_____

C.6 Abuse Assessment Screen (AAS)*

Within the last year, have you been hit, slapped, kicked, or otherwise physically hurt by someone?

- ☐ No
- ☐ Yes

Since you've been pregnant, have you been hit, slapped, kicked, or otherwise physically hurt by someone?

- ☐ No
- ☐ Yes

Within the last year, has anyone forced you to have sexual activities?

- ☐ No
- ☐ Yes

Did this interview bring up any concerns or questions that you would like to discuss with your prenatal care provider?

- ☐ No
- ☐ Yes

Would you like me to approach your prenatal care provider with this concern or question for you?

- ☐ No
- ☐ Yes

*McFarlane, Parker, Soeken, Bullock (1992).

Appendix C
Psychosocial Component

APPENDIX D

SPIRITUAL MEASURE

Code#_____

Appendix D
Spiritual Component

D.1 Spiritual Perspective Scale

Introduction and Directions: A person's spiritual views may be an important part of their life. In general, spirituality refers to an awareness of one's inner self and a sense of connection to a higher being, nature, others, or to some purpose greater than oneself. I am interested in your response to the questions below. There are no right or wrong answers, of course. Answer each question to the best of your ability (show cards).

1. In talking with your family or friends, how often do you mention spiritual matters?

Not at all	Less than once a year	About once a year	About once a month	About once a week	About once a day

2. How often do you share with others the problems and joys of living according to your spiritual beliefs?

Not at all	Less than once a year	About once a year	About once a month	About once a week	About once a day

3. How often do you read spiritually-related material?

Not at all	Less than once a year	About once a year	About once a month	About once a week	About once a day

4. How often do you engage in private prayer or meditation?

Not at all	Less than once a year	About once a year	About once a month	About once a week	About once a day

Code#_____

Directions: Please indicate the degree to which you agree or disagree with the following statements by marking an "X" in the space above the words which best describe you.

5. Forgiveness is an important part of my spirituality.

Strongly Disagree	Disagree	Disagree more than agree	Agree more than disagree	Agree	Strongly agree

6. I seek spiritual guidance in making decisions in my everyday life.

Strongly Disagree	Disagree	Disagree more than agree	Agree more than disagree	Agree	Strongly agree

7. My spirituality is a significant part of my life.

Strongly Disagree	Disagree	Disagree more than agree	Agree more than disagree	Agree	Strongly agree

8. I frequently feel very close to God or a "higher power" in prayer, during public worship, or at important moments in my daily life.

Strongly Disagree	Disagree	Disagree more than agree	Agree more than disagree	Agree	Strongly agree

9. My spiritual views have had an influence upon my life.

Strongly Disagree	Disagree	Disagree more than agree	Agree more than disagree	Agree	Strongly agree

Appendix D
Spiritual Component

Code#_____

10. My spirituality is especially important to me because it answers many questions about the meaning of life.

Strongly Disagree	Disagree	Disagree more than agree	Agree more than disagree	Agree	Strongly agree

Do you have any views about the importance or meaning of spirituality in your life that have not been addressed by the previous questions?

_____

_____

_____

_____

_____

_____

_____

Reed, P.G. (1986). Spiritual perspective scale. Unpublished Instrument, Arizona State University.

Appendix D
Spiritual Component

Code#_____

D.2 Jarel Spiritual Well Being Scale's Religion Questions*

Religious affiliation (if any):_____

How important to you is attending religious service?

___Not important
___Somewhat important
___Important
___Very important

How often would you attend religious service if able?

___Not at all
___Once a year
___Several times a year
___Once a month
___Twice a month
___Once a week
___More than once a week

How often do you usually attend religious service?

___Not at all
___Once a year
___Several times a year
___Once a month
___Twice a month
___Once a week
___More than once a week

*Hungelman, Kenkel-Rossi, Klassen, & Stollenwerk (1985).

Appendix D
Spiritual Component

APPENDIX E

PERCEPTUAL MEASURE

Code#_____

Appendix E
Perceptual Component

Woman's View of Pregnancy

Perceptual Questions*

How do you feel about being pregnant now?

___Very unhappy
___Unhappy
___All right
___Happy
___Very happy

Thinking back to when you became pregnant, what is true or false for you?

I wasn't sure I wanted to be pregnant. ___ True ___ False
I didn't want people to know I was pregnant. ___ True ___ False
I didn't want to think about being pregnant. ___ True ___ False
I didn't know I was pregnant. ___ True ___ False

Thinking of your pregnancy now, what is true or false for you?

I expect to have a normal birth. ___ True ___ False

*Sable et al. (1997).

Did this interview bring up any concerns or questions that you would like to discuss with your prenatal care provider?

☐ No
☐ Yes

Would you like me to approach your prenatal care provider with this concern or question for you?

☐ No
☐ Yes

Offer participant a card with community resources for abused women and chemical dependency treatment programs.

APPENDIX F

OUTCOME MEASURE

Code#_____

Appendix F
Outcome Variables
(From Patient Hospital Record)

1. Infant birth weight _____

2. Low birth weight (≤ 2500 grams)

   ___ No
   ___ Yes

3. Actual weeks gestation _____

4. Preterm infant ≤ 37 weeks

   ___ No
   ___ Yes

5. Actual APGAR at five minutes _____

6. APGAR less than 7 at 5 minutes?

   ___ No
   ___ Yes

7. Unplanned Cesarean delivery?

   ___ No
   ___ Yes

APPENDIX G

POWER ANALYSIS

Power for a test of the null hypothesis

The model will include (A) 0 covariates, which will yield an R-squared of .000. It will include (B) 18 variables in the set of interest, which will yield an increment of .200. The model will also include (C) 0 variables entered subsequent to the set of interest, which account for an additional.000 of variance. The total R-squared for the 18 variables in the model is .200.

The power analysis focuses on the increment for the set of interest (B) over and above any prior variables (i.e. 18 variables yielding an increment of 0.20). With the given sample size of 100 and alpha set at .05 the study will have power of 0.83

The test is based on Model 2 error, which means that variables entered into the regression subsequent to the set of interest will serve to reduce the error term in the significance test, and therefore are included in the power analysis.

This effect was selected as the smallest effect that would be important to detect, in the sense that any smaller effect would not be of clinical or substantive significance. It is also assumed that this effect size is reasonable, in the sense that an effect of this magnitude could be anticipated in this field of research.

Notes

Power computations: Non-central F, Model 2 error

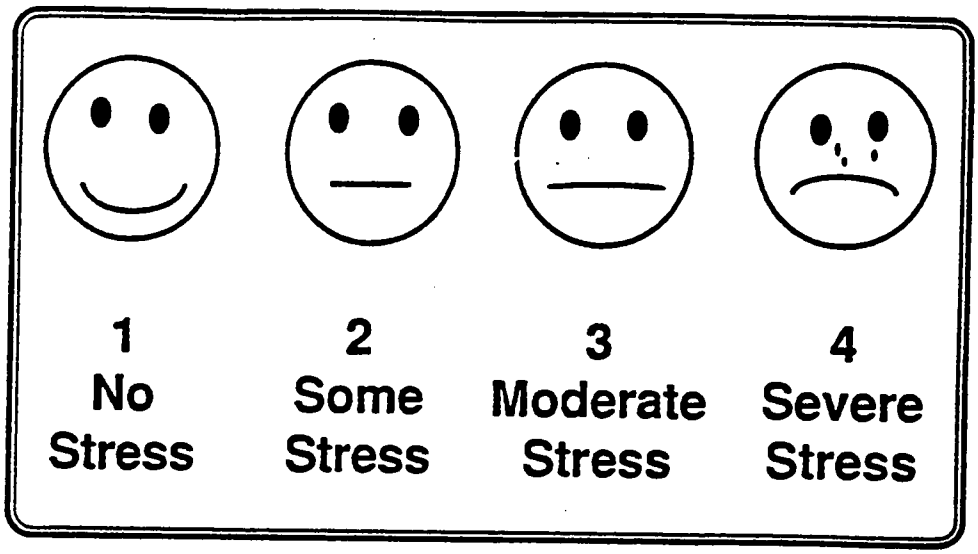
Multiple regression

		Increment to R-Squared			Cumulative R-Squared		
		Number Variables in Set	**Increment to R-Squared**	**Power for Increment**	**Cumulative Number Variables**	**Cumulative R-Square**	**Power for Cumulative R-Squared**
1	Main set	18	0.20	0.83	18	0.20	0.83
	Alpha= 0.05	Designated sets (1 to 1), Number variables = 18, increment= 0.20 N Cases = 100, Power= 0.83					
		Power computations: Non-central F, Model 2 error					

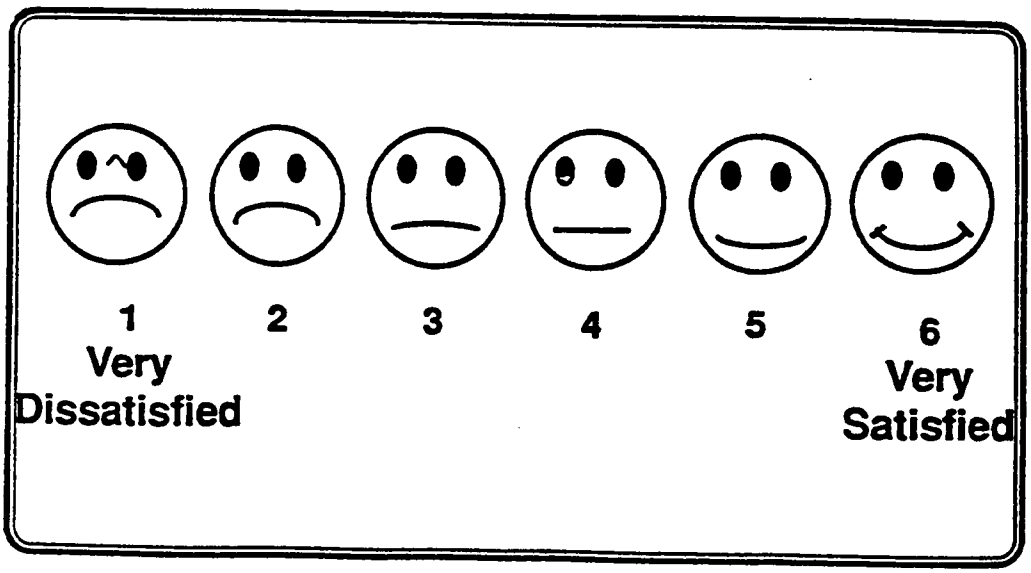
APPENDIX H

SMILEY FACES VISUAL ANCHORS

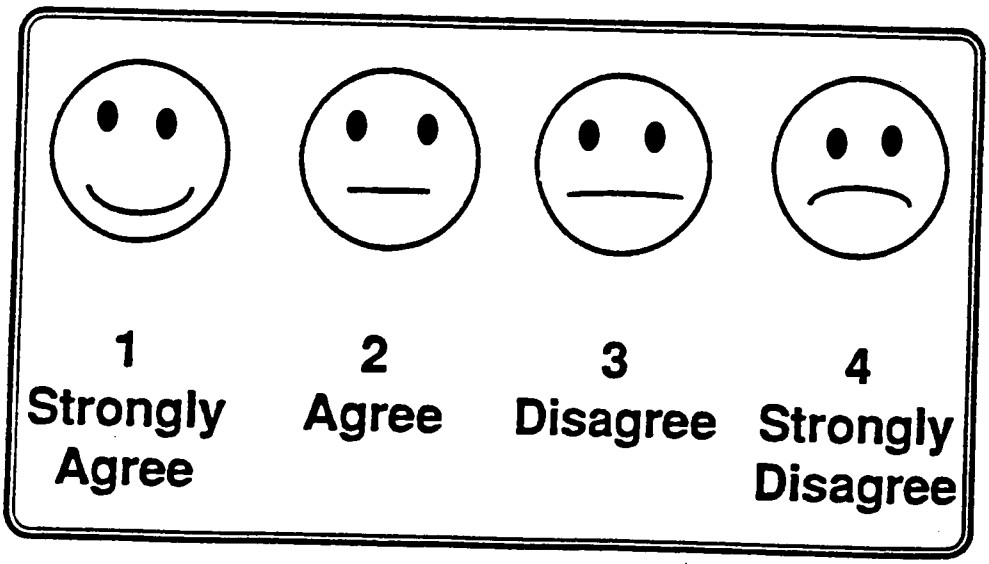
SMILEY FACE VISUAL ANCHOR FOR STRESS



SMILEY FACE VISUAL ANCHOR FOR SOCIAL SUPPORT



SMILEY FACE VISUAL ANCHOR FOR SELF-ESTEEM



APPENDIX I

LETTERS OF SUPPORT

THE UNIVERSITY OF TENNESSEE
MEDICAL CENTER AT KNOXVILLE

• *University Memorial Hospital*
• *Graduate School of Medicine*

Department of Obstetrics and Gynecology
1924 Alcoa Highway
Knoxville, TN 37920-6999
(423) 544-9306
FAX (423) 544-6822

December 4, 1997

D. Elizabeth Jesse
4067 Taliluna Avenue
Knoxville, TN 37919

Dear Ms. Jesse:

I am pleased to support your research project entitled, "Holistic Obstetrical Problem Evaluation (HOPE): A Midwifery Model to predict Health Outcomes in Pregnancy". I understand that you will be collecting research data as a Ph.D. candidate in the University of Tennessee, Knoxville's College of Nursing, Ph.D. Program, and that you are examining the relationship of biopsychosocial, spiritual and the client's perceptions of her own pregnancy to low birth weight, weeks of gestation, APGAR score and unplanned cesarean section.

As we have discussed, you or your trained research assistant will be responsible for collecting data from the prenatal record, from interviews with the patient, and from the labor and delivery summary. We will be happy to assist you with access to these records and clients in our service.

Sincerely yours,

Ran Neiger, M.D.
Director of Obstetric Services and the
Division of Maternal-Fetal Medicine

RN/ms

County Executive
Thomas Schumpert

Knox County

Department of
Public Health

December 1, 1997

D. Elizabeth Jesse
4067 Taliluna Avenue
Knoxville, Tennessee 37919

Dear Ms. Jesse:

We are pleased to support your research project entitled Holistic Obstetrical Problem Evaluation (HOPE): A Midwifery Model to Predict Health Outcomes in Pregnancy. We understand you will collecting research data as a Ph.D. candidate in the University of Tennessee, Knoxville's College of Nursing, Ph.D. Program, and that you are examining the relationship of biopsychosocial, spiritual and the client's perceptions of her own pregnancy to low birth weight, weeks of gestation, APGAR score and unplanned cesarean section.

As we have discussed you or your trained research assistant will be responsible for collecting data from the prenatal record, from interviews with the patient, and from the labor and delivery summary. We will be happy to assist you with access to these records and clients in our service.

Sincerely,

Jan Kaman, R.N., F.N.P.C.
Program Manager

JK/lw

140 Dameron Avenue ♦ Knoxville, TN 37917-6413 ♦ (423) 215-5000 ♦TDD (423) 215-5001 ♦ Fax (423) 215-5295

es E. Darling, Jr., M.D., FACOG
J. Brad Carter, M.D., FACOG
Rosalind Cadigan, M.D., FACOG
Kaye Baltemeier, Ph. D., RNCS
Dava Shoffner, Ph.D., RNCS
C. Dale Hadden, MSN, RNCS
Debra Kitts, RDMS

Westmall Medical Park
Suite 150, 200 New York Ave.
Oak Ridge, Tennessee 37830
Telephone: 423/481-0800
Fax: 423/481-8065

8330 Park West Blvd., Suite 300
Knoxville, Tennessee 37923
Telephone: 423/531-1400
Fax: 423/690-9750

Women's Health Associates, P.C.

Obstetrics & Gynecology

February 13, 1998

Ms. Elizabeth Jessee
4067 Taliluna Avenue
Knoxville, Tennessee 37919

Dear Elizabeth:

We at Women's Health Associates are looking forward to working with you on your Ph.D. project. We are pleased to have been able to review your project and will make our patients available to you. We will be glad to learn of your conclusions when they become available.

Cordially,

Charles E. Darling, Jr., M.D.

CED/tsk-5

APPENDIX J

PERMISSION TO USE INSTRUMENTS

Request Form

I request permission to copy the Spiritual Perspective Scale (SPS) for use in my research entitled,

Holistic Obstetrical Problem Evaluation (HOPE): A midwifery model to Predict Maternal & Perinatal Health outcomes.

In exchange for this permission, I agree to submit to Dr. Reed a copy of the following:

1. An abstract of my study purpose, framework, and findings, especially which includes the correlations between the SPS scale scores and any other measures used in my study. (This will be used by Dr. Reed to assess construct validity).
2. The reliability coefficient as computed on the scale from my sample (Cronbach's alpha).
3. A copy of the one-page scoring sheet for each subject tested or #4.
4. A computer printout listing the data requested (See #3) and data coding dictionary (to decipher coded data).

Any other information or findings that could be helpful in assessing the reliability or validity of the instrument would be greatly appreciated (e.g. problems with items, comments from subjects, other findings).

These data will be used to establish a normative data base for clinical populations. No other use will be made of the data submitted. Credit will be given to me in reports of normative statistics that make use of the data I submitted for pooled analyses.



R. Elizabeth Jesse
(Signature)

Position and Full Address: Doctoral candidate in Nursing @ University of Tennessee, Knoxville
Home address: 4067 Talilupa Trl
Knoxville, TN 37919

Permission is hereby granted to copy the SPS for use in the research described above.

Pamela G. Reed
Pamela G. Reed

12-20-97
(Date)

Please send two signed copies of this form, and a stamped, self-addressed envelope to:

Pamela G. Reed, RN; PhD; FAAN
The University of Arizona College of Nursing
1305 N. Martin St. Tucson, AZ 85721

COLLEGE OF NURSING

MARQUETTE
UNIVERSITY

December 9, 1997

D. Elizabeth Jesse, MSN, CNM, PhDc
4067 Taliluna Avenue
Knoxville, TN 37919

Dear Dr. Jesse:

Thank you for your interest in the **JAREL Spiritual Well-Being Scale**.

You have our permission for use and reproduction of the above named scale for your research. There is no charge for this permission.

In reciprocation, we ask you to send us a complimentary copy of any reports, abstracts, or publications you prepare in which our materials are used. These will be catalogued in our files to serve as a resource for other researchers and clinicians.

If you have any questions, please feel free to contact JoAnn Hungelmann, RN, DNSc, formerly of Loyola University of Chicago School of Nursing whose current address is 5729 North 97th Street, Milwaukee, WI 53225, (414) 464-1150 E-mail jahmann@execpc.com or Ruth Stollenwerk, RN, DNSc, Marquette University College of Nursing, Milwaukee, WI 53201-1881, (414) 288-3800 or (414) 789-8175 (home) 1078 Pilgrim Parkway, Elm Grove, WI 53122.

If you desire reprints of the article "Focus on Spiritual Well-Being: Harmonious Interconnectedness of Mind-Body-Spirit—Use of the JAREL Spiritual Well-Being Scale" in the November/December 1996 issues of *Geriatric Nursing*, Vol. 17, No. 6, please purchase from Mosby's Journal reprints (800) 325-4177 Ext. 4350 or (314) 453-4350; Fax (314) 432-1380.

Sincerely,

Ruth Stollenwerk

Ruth Stollenwerk, RN, DNSc
JoAnn Hungelmann, RN, DNSc
Eileen Kenkel-Rossi, RN, MSN
Loretta Klassen, RN, MS

RS:bja
Enclosure

CLARK HALL P.O. BOX 1881 MILWAUKEE, WISCONSIN 53201-1881 TELEPHONE (414) 288-3800 FAX (414) 288-1597

Mary Curry, 02:32 PM 5/5/98 -, RE: NRSA -Reply

Return-Path: <currym@ohsu.edu.cas.utk.edu>
Date: Tue, 05 May 1998 14:32:47 -0700
"-PH: V4.4@canuck
om: Mary Curry <currym@ohsu.edu>
To: ejesse@utk.edu
Subject: RE: NRSA -Reply
Content-Disposition: inline

May 5, 1998

To: Elizabeth Jessee

You have my permission to use the Prenatal Psychosocial Profile (PPP) in your
research. Best wishes with your research.
Mary Ann Curry, RN, DNSc, FAAN

Judy Mcfarlane, 05:13 PM 5/7/98 -, Re: AAS

Return-Path: <HF_McFarlane@twu.edu.cas.utk.edu>
Date: Thu, 07 May 1998 17:13:00 -0500
X-PH: V4.4@canuck
X-om: Judy Mcfarlane <HF_McFarlane@twu.edu>
Subject: Re: AAS
X-Sender: HF_McFarlane@twu.edu
To: "D. Elizabeth Jesse" <ejesse@utk.edu>

Hi Elizabeth, There is NO copyright on the AAS. Feel free to use the 3-question screen. No letter or permission needed. JUDITH MCFARLANE
>
>
>
>
>

Mary Lou Moore, 02:56 PM 11/30/97, Re: Bowman Gray risk assessmen

Return-Path: <mmoore@isnet.is.bgsm.edu.cas.utk.edu>
Date: Sun, 30 Nov 1997 14:56:12 -0500 (EST)
X-PH: V4.4@dshm02
From: Mary Lou Moore <mmoore@bgsm.edu>
X-Sender: mmoore@isnet
To: "D. Elizabeth Jesse" <ejesse@utk.edu>
Subject: Re: Bowman Gray risk assessment for LBW

You have our permission to use the Bowman Gray preterm labor isk assessment in your research. Mary Lou Moore, Research Assistant Professor, Obstetrics and Gynecology, Wake Forest University School of Medicine.

On Tue, 25 Nov 1997, D. Elizabeth Jesse wrote:

> Hi Dr. Moore. My chair, Debra Wallace suggested that even though the BG
> assessment is public domain, I still needed a written Ok to use it for my
> committee. Could you do this for me, either via e-mail or letter? My address
> is 4067 Taliluna Ave., Knoxville, TN. 39919. I look forward to seeing more
> about your study on phone interventions. I'm submitting an NRSA Dec 5. Wish
> me luck. Thanks, Elizabeth At 01:57 PM 11/21/97 -0500, you wrote:
> >I wanted you to know I received this message. I enjoyed talking to you
> >today. MLM
> >
> >On Tue, 18 Nov 1997, D. Elizabeth Jesse wrote:
> >
> >> Dear Dr. Moore,
> >> I called you last week and we have missed each other. I went outside
> >> for a minute when you returned my call. I am a Ph.D candidate at the
> >> University of TN @ Knoxville's school of nursing. I plan to soon collect my
> >> data. I am examining the relationship of socio-demographic, biopsychosocial,
> >> spiritual and a woman's own view of her pregnancy to birth outcomes (LBW,
> >> gest age, APGAR score and unplanned C/S). I would like to use the Bowman
> >> Gray risk screening variables for my biophysical aggragate with your
> >> permission. I will be taking the biophysical info from the patient charts,
> >> and a few of the BG questions are not included on the University Of
> >> Tennessee, Knoxville's Medical Center initial ob form (cervical cone,
> >> uterine anomoly and >30 min commute to work). I'm considering using the
> >> reduced regression model vs the full model. Let me know what you think and
> >> if you could give me a formal ok to use this screen. Thanks. My address is
> >> 4067 Taliluna Ave., Knoxville, TN 37019.
> >>

APPENDIX K

INFORMED CONSENT

HOPE #_____

HOPE- Pregnancy and Birth Study

Informed Consent

Holistic Obstetrical Problem Evaluation (HOPE): A Midwifery Theory to Predict Maternal and Perinatal Health Outcomes.

You are invited to participate in this research study to understand more about pregnancy and birth. The study consists of an interview to that will take about 20 to 30 minutes to answer questions about your physical health, emotions, spirituality and your pregnancy.

Your answers to the interview are strictly confidential. Your name is not identified on any part of your answers. You will only be identified by a code number on the answer forms. I also need your permission to get information from your prenatal record and the record of your delivery. The information from all of these records will be kept confidential. Your identity and your infant's identity will remain confidential in a locked drawer and separate from your answers to the interview. You will not be identified in any publication or presentation. No report of this research will describe individual cases in a way that could lead to your identification. All answers from the interviews will be stored in a secure file that can only be opened by this researcher, the research assistant(s) and the researcher's advisor. All data will be destroyed after the study is done.

There are no physical risks to you or your baby. You have the right to refuse or withdraw from the study at any time if you feel physically or emotionally uncomfortable. There are no direct benefits to you from participating in this study. However telling your feelings about your pregnancy may feel helpful to you. If any of the questions feel stressful to you I have resources to help. You will be contributing to new knowledge that may benefit others, society and science. This study may assist midwives, nurse practitioners and doctors caring for pregnant women to prevent problems in pregnancy that could effect your birth or your baby's health.You will be given a 4x6 photo book for your time and effort completing the interview.

Your participation in this study is strictly voluntary. There is no penalty or loss of health care services for refusing to participate. There is no change in your prenatal care provided to you by your nurse practitioner, midwife, or doctor because you are in this study, nor will it change any of your health care choices. You may withdraw from participating in this study at any time without any loss of prenatal care or other health care services. If you withdraw from the study before your interview is completed your answers will be destroyed. If you have any questions about this research, or your rights as a research participant, you may call me at 423-974-4151 (leave a message), the IRB University Medical Center Office 423-544-9781, or my advisor, Debra C. Wallace, PhD, RN, 423-974-7596. You will receive a signed and dated copy of this consent form. Thank you.

D. Elizabeth Jesse, PhD (c), RN, CNM
University of Tennessee, Knoxville
College of Nursing

I have read this consent, my questions have been answered and I freely volunteer to participate. I have had possible risks explained to me. I have had the opportunity to ask questions of the researcher and have received acceptable answers. I understand that I may withdraw from this study at any time without change in my prenatal care.

Name (print) _____ **Maiden name**_____
Signature_____ **Date**_____
Researcher:_____ **Date**_____
Witness:_____ **Date**_____

APPENDIX L

IRB LETTER

METHODIST MEDICAL CENTER OF OAK RIDGE

990 Oak Ridge Turnpike
P.O. Box 2529
Oak Ridge, TN 37831-2529
(423) 481-1000

Tennessee Quality Achievement Award
Winner of the 1993, 1994, 1995 and 1996 Tennessee Quality Achievement Award

George Mathews
President

Janice McNally
Vice President and
Chief Nursing Officer

Susan D. Hand
Vice President and
Chief Financial Officer

June 9, 1998

Darlene Elizabeth Jesse
4067 Taliluna Ave.
Knoxville, TN 37919

Dear Ms Jesse,

RE: **Holistic Obstetrical Problem Evaluation (HOPE): A Midwifery Theory to Predict Maternal & Perinatal Health Outcomes**

This is to acknowledge receipt of your informed consent document incorporating changes as requested by the IRB at its May 12, 1998 meeting.

Thank you.

Sincerely,

J. Randall Thomas M.D.

J. Randall Thomas, M.D.
Chair, Investigational Review Board

A Member of Covenant HEALTH

THE UNIVERSITY OF TENNESSEE
KNOXVILLE

Office of Research
404 Andy Holt Tower
Knoxville, Tennessee 37996-0140
PHONE: (423) 974-3466
FAX: (423) 974-2805
URL: http://www.ra.utk.edu/ora

05/01/98

IRB # : 5554B

Title : Holistic Obstetrical Problem Evaluation (HOPE): A Midwifery Theory to Predict Maternal and Perinatal Health Outcomes

Jesse, Darlene Elizabeth
Nursing
4067 Taliluna Ave.
Knoxville, TN 37919

Wallace, Debra
Nursing
1200 Volunteer Blvd.
Campus

The points of clarification you submitted to this office regarding the above-captioned project, satisfied the concerns of the reviewers, thus your project has been approved.

This approval is for a period ending one year from the date of this letter. Please make timely submission of renewal or prompt notification of project termination (see item #3 below).

Responsibilities of the investigator during the conduct of this project include the following:

1. To obtain prior approval from the Committee before instituting any changes in the project.
2. To retain signed consent forms from subjects for at least three years following completion of the project.
3. To submit a Form D to report changes in the project or to report termination at 12-month or less intervals.

The Committee wishes you every success in your research endeavor. This office will send you a renewal notice on the anniversary of your approval date.

Sincerely,

Brenda Lawson

Brenda Lawson
Compliances

cc: Dr. Joan Creasia

VITA

Darlene "Elizabeth" Jesse was born at a birthing center in Tavistock, England, with a midwife in attendance. At age four, she and her mother moved from Tavistock to Duluth Minnesota where she attended grade school, high school and college. She received her Bachelor of Science Degree in Speech Therapy from the University of Minnesota, Duluth in 1966, and her degree in nursing from Tennessee State University in Nashville, Tennessee in 1975. Elizabeth organized and gathered funding to develop a primary health care center in Nashville and set up statewide advocacy groups for pregnant women in Tennessee. After working in labor and delivery for four years, Ms Jesse received her nurse-midwifery degree at Meharry Medical School in 1979, and her Masters of Science Degree in Nursing as a Perinatal Clinical Specialist from Vanderbilt University School of Nursing in 1988. Elizabeth was the first midwife in Tennessee with a private nurse-midwifery practice with hospital privileges. After practicing for 14 years, Ms. Jesse closed her midwifery practice and moved to Knoxville in 1991 to play a key role in developing the Maternity Center of East Tennessee. In the fall of 1993, Elizabeth entered the Doctoral Program at the University of Tennessee, Knoxville, College of Nursing, completing her studies in July, 1999. Throughout her doctoral studies, Ms. Jesse continued to provide nurse-midwifery care to women in out patient, birth center and hospital settings, such as the Frontier Nursing Service, and taught nurses at several levels, including preceptor for graduate level women's health nurse practitioner and nurse-midwifery students. Dr. Jesse's vision for her new doctoral role would include a joint appointment, with clinical practice and teaching, and a continuing research focus examining the effects of disharmony in pregnancy with maternal and perinatal health.