PRENATAL YOGA PRACTICE IN LATE PREGNANCY AND PATTERNING OF CHANGE IN OPTIMISM, POWER, AND WELL-BEING

by

Pamela J. Reis

March 2011

Abstract

The purpose of this study was to explore changes in human-environmental field patterning of optimism, power, and well-being over time, in women during the second and third trimesters of pregnancy upon completion of a 6-week prenatal yoga program. A descriptive design was used to answer research questions developed according to the Science of Unitary Human Beings theoretical framework: (1) what are the changes in patterning, as observed through the manifestation of optimism, power, and well-being over time, in women before beginning and upon completing a 6-week prenatal yoga program during the second and third trimesters of pregnancy, and (2) does change in patterning, as observed through the manifestations of optimism, power, and well-being over time, differ for women beginning yoga classes in the third trimester from women who begin classes in the second trimester of pregnancy?

A convenience sample of 21 pregnant women was recruited from a public health prenatal clinic and a private nurse-midwifery practice in Wake County, North Carolina. The sample was delimited to women who volunteered to participate in the study and were (a) in the second and third trimesters of pregnancy between 20 to 32 weeks gestation; (b) 18 years old and above; (c) able to speak, read, and write in English; and (d) experiencing an uncomplicated, low-risk pregnancy.

To address the first research question, an analysis of patterning change, interpreted as change in scores over time from baseline to completion of a 6-week prenatal program, was tested using a paired samples, two-tailed t-test of significance for the variables of optimism, as measured by the Life Orientation Test-Revised; power, as measured by the Power to Knowingly Participate in Change Tool Version II; and well-being, as measured by the Well-Being Picture Scale and the Short Form-12 Version 2 Physical Component Summary and Mental Component Summary. The mean change in scores for optimism, power, and well-being in this study reflected a statistically significant increase from baseline to completion of the 6-week prenatal yoga program. Regardless of the trimester in which women entered into the study, there was no statistically significant difference in gain scores for optimism, power, and well-being upon completion of the 6-week yoga program.

The findings of this study support field pattern diversity among women who practiced yoga during late pregnancy and manifested over time as greater optimism, power, and well-being. Applications of this study's findings in the care of pregnant women are discussed.

PRENATAL YOGA PRACTICE IN LATE PREGNANCY AND PATTERNING OF CHANGE IN OPTIMISM, POWER, AND WELL-BEING

A Dissertation Presented to the Faculty of the College of Nursing

East Carolina University

In Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy

By Pamela J. Reis

March

2011

PRENATAL YOGA PRACTICE IN LATE PREGNANCY AND PATTERNING OF CHANGE IN OPTIMISM, POWER, AND WELL-BEING

By

Pamela J. Reis

APPROVED BY:

DIRECTOR OF
DISSERTATION/THESIS: _____
Martha R. Alligood, RN, PhD, ANEF

COMMITTEE MEMBER: _____
Robin Webb Corbett, RN-C, PhD

COMMITTEE MEMBER: _____
Melvin S. Swanson, PhD

COMMITTEE MEMBER: _____
Marlaine C. Smith, RN, PhD, AHN-BC, FAAN

DIRECTOR OF THE
PhD PROGRAM, COLLEGE
OF NURSING: _____
Marie E. Pokorny, RN, PhD

DEAN OF THE
GRADUATE SCHOOL: _____
Paul J. Gemperline, PhD

Dedication

This dissertation is dedicated with love and appreciation to my parents, James and Anna Jones, both of whom made their transition before seeing me reach the end of this journey. This work is also dedicated to my husband, Julian, and my son, Paul, the wind beneath my wings.

Acknowledgements

This dissertation is the culmination of an epic journey, marked by the love, support, and encouragement of many individuals. My life has been enriched by your presence, and I am forever indebted to you for your contributions.

I thank my dissertation committee of four enlightened individuals for their time and expertise, and most of all for their faith and belief in me along this journey. Each of you has played an integral role, not only in this dissertation process, but also in informing me about how I can be a better scholar by not losing sight of the reason we do research – to address questions of import in the care of human beings as they live and interact in their environment.

I thank my dissertation chair, Dr. Martha R. Alligood, for her vast knowledge of the doctoral education process and for her wise counsel and encouragement throughout the years. I am honored and blessed to have had her as my mentor and advocate from the very beginning of this process. I am grateful for Dr. Robin Webb Corbett for her knowledge of obstetrical nursing, attention to detail, editorial assistance, interest in my work, and willingness to accept the task of serving on my committee. I thank Dr. Melvin Swanson for his ongoing evaluation of my research trajectory, for helping me navigate the intricacies of my data analysis with impeccable attention to every detail, and for keeping me focused on the 'so what' of my research. I thank Dr. Marlaine Smith, an outstanding holistic nursing scholar and advocate for doctoral students for accepting the invitation to be a valuable part of this journey.

With heartfelt thanks, I acknowledge my family and friends who have been beacons of light along my path on this long journey. I thank my husband, Julian, and my son, Paul, who loved and supported me throughout the years, regardless of how my coping skills manifested

during the challenging phases of this journey. I thank my mentor and friend Dr. Annette Debisette for encouraging me to pursue doctoral education and for being a sounding board along the way.

With gratitude I acknowledge Healthy Moms ® of Wake County, North Carolina for their enthusiasm for my study and generosity in making their yoga program available to my study participants. I thank the women who participated in this study for their time and sharing of their yoga journey. We were all transformed by the experience.

Finally, I thank the Martha E. Rogers Scholars Fund and Sigma Theta Tau International, Beta Nu chapter for providing the financial support that made this study possible.

Table of Contents

Appendices

List of Tables

CHAPTER 1

STATEMENT OF THE PROBLEM

Introduction

Pregnancy is a transformative experience that women typically embrace with optimism, joy, and a commitment to maintaining good health. Yet intense antenatal surveillance and considerable emphasis on risk and danger has supplanted the reality of pregnancy as a normal life process characterized by prudent health behaviors and a sense of well-being. In Western society pregnancy is often viewed as a risk-laden experience that can be considered normal only in hindsight.

The shift in the perception of pregnancy and childbirth from a normal physiologic process to a more pathologic perspective began during the 1920s as birth started to transition from home with midwives to hospitals with physicians, a trend that accelerated after World War II. Advances in medical technology during the post-war era increased the role of hospitals in the American health care system (Rooks, 1997). Physicians practicing in the early 20th century were keen to have women deliver in hospitals in order to provide a training laboratory for studying obstetrics (Wertz & Wertz, 1989). During the 1940s women began to challenge the notion of medicalized birth as safe and efficient, and began to promote natural childbirth as an "orderly, benevolent process, rather than a painful, destructive, and possibly catastrophic experience" (Wertz & Wertz, 1989, p. 178). The feminist movement of the 1970s created even greater fervor in the promotion of natural childbirth as women of all socioeconomic classifications rallied together for control over their bodies and the birth process (Wertz & Wertz, 1989).

While much is known about health behaviors that place women at risk for poor pregnancy outcomes, less is known about self-care and health promotion practices that women routinely utilize to maintain health during pregnancy. While nurses who care for pregnant women in a holistic context are concerned about factors that place women at risk for unfavorable pregnancy outcomes, they highly value pregnancy as a normal experience and want to facilitate those practices that lead to positive pregnancy outcomes whenever possible. There is clearly a need to explore preventive and health promotion activities that advocate and foster healthy lifestyles among all women. Yoga is among those health-promoting activities that are posited to favorably impact physical and psychological well-being. The practice of yoga in the United States has increased dramatically over the past 5 decades. An estimated 15 million adults in the United States have practiced yoga at least once in their lifetime (Saper, Eisenberg, Davis, Culpepper, & Phillips, 2004). The versatility of yoga practice makes it an activity in which nearly anyone can participate, including pregnant women.

In Western cultures, yoga has become a popular activity to promote health and wellness during pregnancy. Yoga is posited to contribute to prenatal comfort and support for childbirth in several ways. The gentle stretching that occurs during yoga asanas (postures) helps relieve musculoskeletal discomforts of pregnancy and prepares the pelvic and lower extremity muscles for childbearing (Collins, 1998). The breathing and relaxation techniques of yoga promote improved respiratory capacity that alleviates pregnancy-related shortness of breath and enhances breathing during labor (Narendran, Nagarathna, Narendran, Gunasheela, & Nagendra, 2005). Many of the techniques used in childbirth preparation classes have roots in yoga (Collins, 1998). Yoga practice may contribute to greater self-efficacy during labor (Sun, Hung, Chang, & Kuo, 2009). In addition, yoga may contribute to higher birth weight, lower incidence of preeclampsia,

decreased risk for preterm birth, less likelihood of urgent cesarean birth, and reduced risk of fetal demise (Narendran, Nagarathna, Narendran, et al., 2005). Improved maternal comfort in labor and facilitation of labor progress has also been reported (Chuntharapat, Petpichetchian, & Hatthakit, 2008). These findings demonstrate the potential for yoga to favorably impact physical health and birth outcomes.

Yoga is presumed to increase optimism and positive thinking. According to B.K.S. Iyengar (2001), the creator of a popular form of Hatha yoga known as Iyengar yoga, the practice of yoga "fills up the reservoirs of hope and optimism within you" (p. 9) and is an ideal practice during pregnancy to promote physical and emotional well-being. There has been interest in optimism and the power of positive thinking for decades, and evidence that suggests a strong correlation between optimistic disposition and physical and psychological health and well-being is emerging (Grote & Bledsoe, 2007; Nelson, McMahon, Joffe, & Brensinger, 2003; Park, Moore, Turner, & Adler, 1997; & Rasmussen & Scheier, 2009). Aggregate analysis of studies exploring the relationship of optimism to physical health strongly suggests that optimism is a significant predictor of physical health, even when the effect size is adjusted for demographic factors, health status and risk factors, and relevant psychosocial factors (Rasmussen & Scheier, 2009). Since support for optimism as a predictor of positive health outcomes has been demonstrated, the potential efficacy of yoga in promoting optimistic and positive thinking during pregnancy deserves further inquiry.

Many individuals in the United States use integrative and complementary alternative medicine (CAM) modalities, such as yoga, for health and well-being. According to a 2007 national survey, 40% of all individuals in the United States have used complementary alternative therapies in the past 12 months. Women are the most frequent users of CAM (over 49%) versus

men (38%) (Fugh-Berman & Kronenberg, 2003), and use of CAM during pregnancy is common (Adams, Lui, Sibbritt, Broom, Wardle, Homer, & Beck, 2009; Fugh-Berman & Kronenberg, 2003). From 2002 to 2007 the use of mind-body therapies increased, with approximately 6% of the population having practiced yoga (Fugh-Berman & Kronenberg, 2003). There is some evidence for ethnic-specific CAM modality preferences. For example, surveys of CAM usage among diverse populations has demonstrated that Asian Americans tend to have a preference for Traditional Chinese Medicine over other CAM modalities; Native Americans use their own traditional healing systems such as shamanism and sacred ceremonies that vary from tribe to tribe; African Americans incorporate spirituality and prayer in healing; Latino people seek the services of curanderos and herbalists; and non-Latino Whites tend to choose osteopathic and chiropractic medicine (Birdee, Legedza, Saper, Bertisch, Eisenberg, & Phillips, 2008; Hsiao, Wong, Goldstein, Yu, Anderson, Brown, et al., 2006).

The prevalence of yoga practice as a CAM modality among multiethnic populations has not been widely reported; however, in a survey of multicultural and ethnically diverse women living in New York City, practices such as yoga, meditation, and spirituality were rated as highly effective, and racial and ethnic differences in the use of any particular CAM modality was minimal (Brown, Barner, Richards, & Bohman, 2007; Factor-Litvak, Cushman, Kronenberg, Wade, & Kalmuss, 2001). Racial and ethnic differences in the use of CAM is rather complex, as a substantial number of ethnicities with varying sociodemographic characteristics use a variety of CAM therapies for both health maintenance and for treating specific disorders (Brown et al., 2007; Factor-Litvak et al., 2001; & Hsiao et al., 2006).

Interest in yoga in the African American community is increasing as yoga is recognized as a natural and sensible way to improve health and well-being (Roquemore, 2001). A

substantial number of African Americans report the use of complementary and alternative therapies, most often to treat specific disease states, and many use Ayurveda, including yoga, to prevent illness (Barnett, Cotroneo, Purnell, Martin, Mackenzie, & Fishman, 2003; Brown et al., 2007; Kronenberg, Cushman, Wade, Kalmuss, & Chao, 2006). In a study of yoga's effect on health and well-being among African American and Hispanic women with newly diagnosed or recurrent breast cancer, the majority of African American women who participated in the intervention followed the prescribed regimen of yoga practice and reported the yoga experience as positive (Moadel, Shah, Wylie-Rosett, Harris, Patel, Hall, & Sparano, 2007).

Assisting women in exploring evidence-based, self-care strategies that maximize health potentials is an important aim of nursing practice. Yoga is a low-cost health promotion activity, particularly if practiced within the home, and the regular practice of yoga has been demonstrated to result in increased physical strength, flexibility, and vitality; decreased stress; and an overall sense of well-being. Traditionally, ethnic minority and socioeconomically disadvantaged women are underrepresented in studies that have explored yoga practice among individuals living in the United States.

Pregnancy is an opportune time for suggesting health promotion activities, especially among low-income women who are at highest risk for untoward pregnancy outcomes. Since nurses caring for pregnant women seek to empower them in their care through education and advocacy, and since yoga is a potential benefit to pregnant women, this study examined changes over time in optimism, power, and well-being during the second and third trimesters in women who practiced yoga.

Purpose

The purpose of this study was to explore changes in human-environmental field patterning of optimism, power, and well-being over time in women during the second and third trimesters of pregnancy upon completion of a 6-week prenatal yoga program.

Research Questions

1. What are the changes in patterning, as observed through the manifestation of optimism, power, and well-being over time, in women before beginning (baseline) and upon completing a 6-week prenatal yoga program during the second and third trimesters of pregnancy?

2. Does change in patterning, as observed through the manifestations of optimism, power, and well-being over time differ for women beginning the 6-week prenatal yoga program in the third trimester from women who begin the program in the second trimester of pregnancy?

Theoretical Approach

This study was guided by Rogers' Science of Unitary Human Beings (SUHB). This framework was first presented by Martha Rogers in 1970 as a "conceptual model of the life process in man [sic]" (Rogers, 1970, p. 89) and has undergone several refinements to become the nursing conceptual system known as the Science of Unitary Human Beings (Fawcett, 2005; Rogers, 1992). The unique focus of Rogers' theory is the philosophical belief that humans and the environment are energy fields that exist as open systems, in continuous mutual process with one another. The SUHB is concerned with evolving patterns of the human and environmental energy fields that are associated with well-being (Rogers, 1970). Viewing the experience of individuals from the perspective of well-being conveys a positive understanding of the life

process and therefore is a more appropriate term than health as applied to nursing, since the term health is ambiguous (Rogers, 1994).

Optimism and power are salient dimensions of well-being. Human beings have the power to participate knowingly and probabilistically in the process of change within the unitary energy field (Barrett, 1986; Rogers, 1970, 1992) as they strive optimistically toward a sense of well-being. The construct of optimism as unitary is not specifically expressed in the writings of Martha Rogers. However, Rogers acknowledged that the SUHB conceptual system is an evolving framework in which "a humane and optimistic view of life's potentials grows as a new reality appears" (Rogers, 1986, p. 4).

The interpretation of optimism, manifested as hopefulness and confidence about the future and a tendency to look favorably upon life, is consistent with the philosophical beliefs about unitary human beings stated within Rogers' conceptual system. Within the Rogerian model, optimism is understood as patterning within the human-environmental energy field, and differences in optimism among individuals reflect diversity of energy field patterning. People can participate knowingly in changing field rhythms in patterning optimistic well-being. In spite of the apparent theoretical congruency of optimism with the SUHB, no studies that explored the concept of optimism during pregnancy from a SUHB perspective as was examined in this study were found.

Power, from a Rogerian science perspective, is the capacity to participate knowingly in change, demonstrated as continuous patterning of the human-environmental field (Barrett, 2000). Barrett's theory of power (1983,1986) derives from the Rogerian homeodynamic principle of helicy, which describes the nature and direction of change as continuous, innovative, unpredictable, and increasing diversity of human and environmental field patterns (Rogers,

1992). Power is an observable pattern manifestation of awareness, choices, freedom to act intentionally, and involvement in creating change (Barrett, 2000; Barrett & Caroselli, 1998). Awareness is defined as focusing attention on what one perceives to exist; choices are selections from a realm of possibilities; freedom to act intentionally is the capacity to bring about what is held in thought; and involvement in creating change is creative engagement in actualizing some potentials rather than others (Barrett, 2003). Barrett's theory of power posits that people can knowingly participate in creating change by actualizing some of their potentials rather than others by being self-aware, making choices, acting on intentions, and being involved in creative change (Barrett, 1986), thereby achieving a sense of well-being.

Power has been posited to be related to the unitary conceptualization of well-being. Kim, Kim, Park, Park, and Lee (2008) tested the relationship of power to well-being using Barrett's Power as Knowing Participation in Change Tool (1986) and Gueldner's (Gueldner et al., 2005) Well-Being Picture Scale (WPS) among 881 South Korean men and women. Power and well-being were significantly correlated ($r = .52$, $p < .001$), and power accounted for 27% of the variance of the well-being. These findings support the proposed relationship of power to well-being as was explored in this study.

In the SUHB view, pregnancy is a non-linear process of transformative change manifested as greater health and well-being of both mother and infant. The developing fetus is a human energy field contiguous with another and is a "pandimensional extension of the manifestation of the mother's human field image in continuous process with her environmental field" (Poulios, 1997, p. 231). Rogers' SUHB embraces mother and child as unitary. This study examined patterning changes in optimism, power, and well-being in women who practice yoga during late

pregnancy as congruent with the Rogerian unitary postulates and the homeodynamic principles of change.

Definition of Terms

Optimism, a manifestation of unitary field patterning, is defined as hopefulness and confidence about the future and a tendency to look favorably upon life as measured by Life Orientation Test-Revised (Scheier, Carver, & Bridges, 1994), a 10-item measure of personal differences in optimism and pessimism with higher scores associated with greater optimism.

Power is "being aware of what one is choosing to do, feeling free to do it, and doing it intentionally" (Barrett & Caroselli, 1998, p. 9) as measured with the Power as Knowing Participation in Change Tool Version II (PKPCT v II) (Barrett, 1986), with higher scores associated with greater power.

Well-being is diversity within the human-environmental field process that manifests as "higher frequency and harmony within the mutual human-environmental field process" (Gueldner et al., 2005, p. 43) as measured using the *Well-Being Picture Scale* scores, with higher scores associated with greater well-being (Gueldner et al., 2005).

Yoga is a modality that promotes the awareness of wholeness and balance in the person-environmental energy field through postures, breathing, and meditation. In this study yoga is defined as it was practiced in the Healthy Moms® Perinatal Fitness program. In this structured yoga program, focused breathing, gentle stretching, standing and seated yoga postures, and relaxation are practiced during 1-hour sessions. Religious philosophies, spiritual practices, or adherence to a particular yoga tradition are not incorporated in this program (Healthy Moms® Perinatal Fitness, 2009).

Pattern is an abstraction defined as "the distinguishing characteristic of an energy field perceived as a single wave" (Rogers, 1992, p. 29).

Patterning is the observable manifestations of the dynamic human-environmental field process over time. Manifestations of patterning are readily perceived through sensory mechanisms that are amenable to empirical measurement (Alligood & Fawcett, 2004).

Human-Environmental (Energy) Field is the integral human and environmental energy field process, which is a pandimensional energy field identified by pattern (Rogers, 1992).

Delimitations and Limitations

Delimitations

This study was delimited to pregnant women between the ages of 18 and 45 years in the second and third trimesters of pregnancy who could read and comprehend English, were receiving prenatal care in an urban public health clinic and private midwifery practice setting, and were experiencing an uncomplicated pregnancy.

Limitations

The purposeful convenience sampling design, small sample size, and absence of randomization limit the generalizability of the findings.

Significance of the Study

This study was significant for three reasons. First, the primary aim of nurses who care for pregnant women and their families is to assist them in mobilizing resources that promote maximum health potentials. In Western culture, pregnancy has been accentuated as a potentially stress-laden experience, rather than a time of joy, contentment, and wholeness for women and their families. Nurses practicing within the framework of the SUHB view pregnancy in a positive light, accepting diversity in human field patterning as the norm (Malinski, 1986). In the

research literature, the health and well-being of pregnant women are slanted toward a pathological view of their condition through intense focus on risk for untoward pregnancy outcomes. A dearth of knowledge exists about health-promoting practices that enhance the likelihood of a healthy pregnancy, especially among socioeconomically disadvantaged women. Yoga is a widely accepted modality that promotes physical, psychological, and spiritual well-being. Encouraging positive health practices such as yoga supports pregnancy as a transformative period of well-being that women can embrace with enthusiasm, optimism, and power. Moreover, the practice of yoga cultivates empowerment, peace, and harmony for the entire family, supporting yoga as unitary.

Second, for centuries yoga has been practiced as a path to holistic health and well-being, producing a state of complete harmony of mind, body, and spirit. Yet yoga practice during pregnancy among ethnically and socioeconomically diverse women is relatively unexplored. This study explored changes over time in optimism, power, and well-being in a diverse population of women who practiced yoga in the second and third trimesters of pregnancy.

Third, the contribution of new knowledge to the discipline of nursing is noted. This study embraces a self-care activity at a time when health care is focused on the need for evidence-based practice and strategies to maximize health potentials and decrease health disparities through wellness initiatives. This study contributes knowledge of an activity that can be prescribed by nurses to address these needs.

Summary

Pregnancy is a transformative and positive experience in the life cycle of women. Yet there is much focus on health behaviors that place women at risk for poor pregnancy outcomes

and less focus on health promotion activities that promote positive pregnancy outcomes, especially among low-income women.

In the Science of Unitary Human Beings worldview, individuals have the power to participate knowingly and probabilistically in the process of change within the unitary energy field (Rogers, 1970, 1992) as they strive toward a sense of harmony and well-being. Yoga practice during pregnancy is conceptualized as continuous mutual exchange within the mother-child group energy field and is congruent with the philosophical view of unitary man expressed within the Science of Unitary Human Beings nursing framework. The aim of nurse-midwives and other providers who care for pregnant women is to "affirm the power and strength of women and the importance of their health in the well-being of families, communities and nations" (American College of Nurse-Midwives, 2004). Self-care activities that promote holistic health and wellness prescribed by nurses, such as yoga, are consistent with this aim and with the SUHB unitary view of human beings.

There has been interest in optimism and the power of positive thinking for decades, and evidence has emerged that suggests a strong correlation between optimistic disposition and well-being. This study examined changes in optimism, power, and well-being over time in women who practiced yoga in late pregnancy from an SUHB perspective as patterning changes within the human-environmental energy field.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

The purpose of this study was to explore changes in human-environmental field patterning of optimism, power, and well-being over time in women during the second and third trimesters of pregnancy upon completion of a 6-week prenatal yoga program.

Consistent with the aims of this study, the review of literature is as follows: (a) literature that describes well-being and power from a Science of Unitary Human Beings (SUHB) perspective; (b) literature that supports optimism as a unitary construct; (c) literature that explores optimism during pregnancy; (d) literature that examines yoga practice for the promotion of health and well-being; and (e) literature that explores the practice of yoga during pregnancy.

Well-Being in Rogers' Science of Unitary Human Beings

Well-being is a multidimensional concept that includes perceived health, social support, self-esteem, a sense of control, joy, and satisfaction with life (Diener, 1985; Ryan & Deci, 2001; Yarcheski, Mahon, & Yarcheski, 2001). With an increasing number of individuals living with chronic illnesses, a new paradigm of wellness that is care-oriented rather than cure-oriented has emerged. The absence of illness is no longer the fundamental condition for health (Hwu, Coates, & Boore, 2001).

An analysis of the writings of Martha E. Rogers over time suggests that her worldview of health evolved to a preference for the term well-being to reflect the unitary conception of health and illness. In one of her last publications, Rogers stated in a discussion of nursing that "if our primary purpose is promotion of health, well-being is a much better term because the term health

is very ambiguous" (Rogers, 1994, p. 34). Well-being coveys a holistic understanding of people as they interact within their environment and therefore is a more appropriate term than health as applied to nursing (Rogers, 1994).

A body of knowledge defines well-being through observation and measurement of health-related variables that are unique to the SUHB such as human field motion and field rhythms. The concept of motion is described in Rogers' (1970) science as a manifestation of dynamic, continuous, and creative change in the human life process. Perceived field motion and human field rhythms are Rogerian science variables that have been posited to be associated with well-being (Gueldner et al., 2005; Yarcheski, Mahon, & Yarcheski, 2004). Patterning is the visible manifestation of human and environmental field motion that can be measured by instruments derived within the theoretical framework of the SUHB (Alligood & Fawcett, 2004; Fawcett; 2005; Ference, 1980, 1986; Gueldner, 1986; Gueldner et al., 2005; Rogers, 1992). Frequency, action, awareness, and power are posited to be empirical constructs of human field motion and rhythm that manifest as patterning of well-being (Gueldner et al., 2005). In this study, well-being was posited as diversity within the human-environmental field process manifested as higher Well-Being Picture Scale (Gueldner et al., 2005) scores.

Based on Ference's (1980) work in human field motion, Gueldner et al. (2005) developed the Well-Being Picture Scale (WPS) as a theoretical interpretation of well-being within Rogerian science (Gueldner et al., 2005). The WPS is a 10-item pictorial scale that measures characteristics of energy field motion that are posited to reflect a sense of well-being. Conceptually, the instrument appraises the energy field in regard to frequency and intensity of movement, awareness of oneself as energy, action emanating from the energy field, and power

as knowing participation in change within the mutual human and environmental energy field process (Gueldner et al., 2005). It is posited that individuals experience a sense of well-being during times of higher frequency and harmony within the mutual human-environmental field process (Gueldner et al., 2005). The psychometric properties of the scale were established in a sample of 1,027 individuals from the United States, Taiwan, and Japan (Gueldner, 2007; Gueldner et al., 2005). According to Gueldner et al. (2005), the WPS has good internal consistency, with a Cronbach's alpha coefficient of .88 reported in the 1,027 sample.

A pilot study by Reis and Alligood (2008) lends support for the reliability of the WPS during pregnancy, with an overall Cronbach's alpha coefficient of .88 reported. Fifty-five pregnant, low-income African American, Native American, Hispanic, and Caucasian women from three prenatal clinics in southeastern North Carolina completed the WPS (Gueldner et al., 2005) as a measure of well-being. The majority of participants were in the second and third trimesters of pregnancy. The WPS was reported by all participants to be easily understood, regardless of native language. Differences in WPS mean scores among the ethnic groups were not significant, and a trend toward lower WPS mean scores was noted among the women who were more advanced in gestation. The trend toward lower WPS scores with increasing gestation could be attributed to the impact of physical and emotional challenges of mid- to late pregnancy.

Power in Rogers' Science of Unitary Human Beings

Power as knowing participation in change (Barrett, 1983, 1986) is posited to be a salient dimension of well-being. The theory of power as knowing participation in change was first described in Barrett's doctoral dissertation, which was completed with Rogers at New York University (Barrett, 1983). Barrett linked the ability to participate knowingly in change to the concept of power, which emerges from the principle of helicy within the Rogerian model

(Barrett, 1983, 1986; Gunther, 2006). Barrett describes power as the freedom and awareness to make choices about life situations and health promotion activities, and going about making these changes intentionally (Barrett, 2000).

Barrett (2010) describes two types of power as they exist within the Rogerian conceptual framework: power-as-freedom and power-as-control. Power-as-freedom operates as a unitary manifestation of the whole in accordance with an acausal worldview, whereas power-as-control represents a causal interpretation of power within a particulate or reductionist worldview (Barrett, 2010). Consistent with Barrett's theory of power-as-freedom, people participate in creating their reality by actualizing some of their potentials rather than others. The observable pattern manifestations of power are awareness, choice, freedom to act intentionally, and involvement in creating change (Barrett, 2000). Barrett developed the Power as Knowing Participation in Change Tool (PKPCT) (Barrett, 1986, 2000), based on Ference's (1980) human field motion work (Barrett, 1986), to measure the construct of power within Rogers' science. Within the last two decades, a great deal of research has tested the relationship of Barrett's theory of power to various dimensions of well-being such as life satisfaction and purpose in life (Rizzo, 1990); creativity and reminiscence (Bramlett, 1990); health-related hardiness and uncertainty (Stoekle, 1993); perceived health and life satisfaction (McNiff, 1995); and human field motion (Barrett, 1996). This study adds to the body of knowledge about the relationship of power and well-being in pregnancy, a domain that was unexplored.

The relationship of power and well-being was tested by Kim et al. (2008) using the PKPCT (Barrett, 1986) and WPS (Gueldner et al., 2005). In that study, 881 South Korean men and women completed the Korean version of the PKPCT and the WPS. The mean age of participants was 31.5 years, and the mean level of education was 15.1 years. The authors found

that power and well-being were significantly correlated ($r = .52$, $p < .001$) and that the total power score accounted for 27% of the variance of the well-being score. The findings of that study suggested synergy in the relationship of power and well-being from a Rogerian science view, as was also found in this study.

Well-Being and Health-Related Variables

Health-related variables unique to Rogerian science, such as perceived field motion and human field rhythms, are posited to contribute synergistically to a sense of well-being. Yarcheski, Mahon, and Yarcheski (2004) found significant positive relationships among perceived field motion, perceived health status, health conception, and well-being in 142 adolescents between the ages of 12 and 14 years. Both Rogerian science instruments, specifically the Perceived Field Motion Scale (Yarcheski & Mahon, 1991) and the Human Fields Rhythm visual analog scale (Yarcheski & Mahon, 1991), as well as those derived outside of Rogerian science such as the General Health Rating Index (Davies & Ware, 1981), Laffrey Health Conception Scale (Laffrey, 1986), and the Adolescent General Well-Being Questionnaire (Columbo, 1986) were used to measure the study variables. Perceived field motion was measured using the Perceived Field Motion Scale (Yarcheski & Mahon, 1991), developed from Barrett's (1983) theoretical definition of human field motion as "a perceptual experience of motion and an index of unitary human development that manifests the continually moving position and flow of human field pattern" (pp. 30-31). Human field rhythms were measured using the Human Field Rhythms scale, a one-item visual analogue scale, developed from Rogers' (1986) theoretical statement about human field rhythms (Yarcheski & Mahon, 1991). Perceived health status was measured by the General Health Rating Index, a 22-item summated rating scale that measures perceived health status (Davies & Ware, 1981). Health conception

was measured by the Laffrey Health Conception Scale (LHCS), a 28-item summated rating scale that measures the meaning of health from the individual's perspective (Laffrey, 1986). Well-being was measured by the short version of the Adolescent General Well-Being Questionnaire, a 39-item scale that assesses subjective well-being in adolescents (Columbo, 1986). The trend in the magnitude of correlations increased across the three health-related variables, with well-being having the strongest correlation with human field rhythms in early adolescence. The findings suggest that while the three health-related variables of perceived health status, health conception, and well-being are congruent with Rogers' science, well-being is most congruent with human field rhythms and therefore is a more consistent term than health within the Rogerian conceptual system (Yarcheski et al., 2004). A noteworthy strength of the study was the convergence of the reliability of the Rogerian and non-Rogerian instruments used in the empirical approach in the study. The authors concluded that there is a need for similar investigations of the phenomenon of well-being in diverse populations with instruments developed within the SUHB as well as those compatible with the conceptual and theoretical framework of Rogerian science, as was accomplished in this study.

Optimism as Unitary

The construct of optimism as unitary is not specifically expressed in the writings of Martha Rogers. However, Rogers acknowledged that the SUHB conceptual system is an evolving framework in which "a humane and optimistic view of life's potentials grows as a new reality appears" (Rogers, 1986, p. 4). Human beings have the power to participate knowingly and probabilistically in the process of change within the unitary energy field (Rogers, 1970, 1992) as they strive optimistically toward a sense of well-being. In this study, optimism is conceptualized as hopefulness and confidence about the future with a tendency to look favorably

upon life. This view is consistent with the philosophical beliefs about human beings stated within Rogers' conceptual system.

A review of the literature revealed that optimism is conceptualized within two paradigms. The first paradigm is based on explanatory style in which optimists attribute challenges in their lives to temporary, specific, and externally driven causes as opposed to pessimists, who attribute challenges to permanent, pervasive, and internal causes (Reivich & Gillham, 2003; Seligman, 2006). The second paradigm presents optimism as a dispositional trait in which generalized outcome expectancies are the root of optimistic rather than pessimistic disposition. Optimism within this paradigm is based on expectancy-value theories, which assume that human behavior is motivated by pursuit of specific goals. If an individual is confident that a goal is attainable, a sense of optimism prevails. If there is a lack of confidence in goal attainment and the goal is perceived as unattainable, an individual will most likely give up or fail to take action on the task at hand (Scheier & Carver, 1987).

In the outcomes expectancy paradigm, optimists expect the best out of life and are aware of the need to be a "part of the matrix of influences" (Carver & Scheier, 2003, p. 77). Rogers (1970) stated that the "life process is characterized by probabilistic goal-directedness" (p. 99) as a characteristic of the principle of helicy. The goal-directedness focus of the expectancy-values theory of optimism is compatible with the Rogerian philosophical claim that the nature of unitary field patterning is diverse and that individuals have the capacity to participate knowingly in the process of change. Differences in optimism among individuals reflect diversity of energy field patterning. People can participate knowingly in changing field rhythms toward greater patterning of optimistic well-being.

Optimism during Pregnancy

Optimism has emerged from a number of studies of pregnant women focused on the negative aspects of emotional health, such as stress and depression. This study looked at optimism in a positive light, focusing on evidence suggesting that a positive, optimistic outlook may enhance well-being during pregnancy (Brissette, Scheier, & Carver, 2002; Scheier & Carver, 1987).

In a longitudinal prenatal study, Lobel, DeVincent, Kaminer, and Meyer (2000) examined the relationship of optimism, as measured by the Life Orientation Test (LOT) (Scheier & Carver, 1985), and prenatal maternal stress on birth weight and gestational age at birth among 129 medically at-risk pregnant women. While not a statistically significant finding, optimistic women had larger infants and less perceived stress than women who were less optimistic. Optimistic women in that study were significantly more likely to exercise and practice good nutrition.

In a similar study of women with high-risk pregnancies, Lobel, Yali, Zhu, DeVincent, and Meyer (2002) found that optimistic women were more likely to view their high-risk pregnancy as a controllable stressor and were more likely to utilize coping mechanisms besides avoidant coping than women who were less optimistic. Likewise, Park, Moore, Turner, and Adler (1997) found that adaptive coping to stress through constructive thinking (the ability to think and problem-solve in everyday situations) led to increased optimism, reduced anxiety, and decreased use of substances in the third trimester of pregnancy among women at high risk for adverse birth outcomes. The findings of these studies support optimistic disposition as a mediator of stress, and therefore health practices that promote positive thinking should be recommended during pregnancy.

In a study of multiethnic, low-income women, Grote, Bledsoe, Wellman, and Brown (2007) found that although women in their study reported a greater number of chronic rather than acute stressors, on the average they reported a moderate degree of optimism. The findings of this study suggest that an optimistic disposition may facilitate adaptation to chronic stress, supporting the need for further inquiry in this area, particularly in examining changes in optimism and health promotional practices.

Carver and Gaines (1987) examined the buffering effect of optimism on postpartum depression in 75 women in the third trimester of pregnancy recruited from childbirth classes at three hospitals in the Dade County, Florida area. The majority of participants (80%) were non-Hispanic White; 16% were Hispanic, 3% were Black, and 1% was Asian. All but two were married, and most were primiparous. Participants completed a modified version of the Beck Depression Inventory (Beck, 1967) and the LOT (Scheier & Carver, 1985) during the third trimester and at 21 to 30 days postpartum. The authors found that optimism had a powerful buffering effect against postpartum depression, especially among women who were not depressed during late pregnancy. Likewise, Grote and Bledsoe (2007) found that the buffering effect of an optimistic disposition may extend beyond the early postpartum period and throughout the first year following birth. In their study, optimism during pregnancy was associated with significantly lower levels of depressive symptoms at 6 and 12 months following birth, after controlling for antenatal depressive symptoms. In addition, optimism was found to buffer the effects of financial, spousal, and physical stress both before birth and at 6 and 12 months postpartum.

The review of the literature exploring the buffering effect of optimism during pregnancy upholds the need to identify positive protective factors such as optimism during the prenatal

period. Evidence in this area lends support for advocating yoga practice as a means to promote positive thinking and optimism during pregnancy for all women.

Yoga Practice and Well-Being

Yoga is a system of practices aimed at achieving a sense of balance and wholeness. The word yoga is derived from the Sanskrit root yuj, which means to bind, join, or yoke in union or communion (Iyengar, 1979). The union of the individual self (jivatma) with the universal self (paramatma) is yoga (Iyengar, 2001). Yoga consists of a variety of practices that include postures (asanas), breathing exercises (pranayama), meditation, relaxation, mantras, spiritual beliefs, and specific principles for living (Iyengar, 1979). For over 2000 years, yoga has been demonstrated to improve flexibility, decrease muscle tension and stiffness, enhance cardiovascular and respiratory functioning, and enhance psychological well-being (Collins, 1998; Narendran, Nagarathna, Narendran, et al., 2005).

Although the practice of yoga varies according to style and ritual, the philosophical basis of yoga is described in the form of eight limbs or steps: yama (ethical principles), niyama (discipline and self-purification), asana (postures), pranayama (rhythmic breath control), pratyahara (emancipation of the mind from the dominance of the senses and external foci), dhyans (meditation), and samadhi (loss of the sense of separate existence; possessing a universal spirit). These stages are sequential steps in an individual's journey through yoga (Iyengar, 1979; 2001). In the West, yoga practice typically consists of postures, breathing, and meditation and may or may not conform to spiritual or religious beliefs or ritual, in spite of its origins in Hindu philosophy (Collins, 1998).

Yoga Practice in the United States

The practice of yoga in the United States has increased dramatically over the past 5 decades. An estimated 15 million adults in the United States have practiced yoga at least once in their lifetime (Saper et al., 2004). Typically, yoga users are female, between the ages of 34 and 53 years, college-educated, non-Hispanic White, and urban dwellers (Birdee et al., 2008; Saper et al., 2004). In spite of the apparent wide-spread popularity of yoga as a health promotion activity in the United States, much of the research in the area of yoga practice has occurred in India. While it is fairly well established that individuals in the United States commonly use complementary and alternative therapies, a disproportionately small body of Western literature on yoga practice as a CAM modality is found.

Most yoga practitioners practice yoga to promote wellness, and the majority reports that yoga practice is helpful for their health conditions (Birdee et al., 2008; Saper et al. 2004). Yoga is commonly practiced for a number of health conditions such as back or neck pain, arthritis, respiratory problems, anxiety, depression, and fatigue (Saper et al., 2004). Yoga practitioners are less likely to be obese, smoke, or drink alcohol, and are more likely to report better health status than non-practitioners (Birdee et al., 2008). Saper et al. (2004) reported that the majority of yoga practitioners in their study did not report spending money within the previous 12 months on yoga classes or books, which supports that yoga is a low-cost health promotion option that can be embraced by individuals of all income levels.

While yoga practitioners overwhelmingly perceive yoga as being important for health and well-being, little is known about the perception of yoga's health benefits among individuals who have never practiced yoga. To explore the relationship between yoga practice and the Health Belief Model, Atkinskon & Permuth-Levine (2009) conducted focus groups of adult

female and male yoga practitioners and non-practitioners recruited from a mid-Atlantic yoga studio and from a local employer. Two focus groups (yoga practitioners and non-practitioners) for each of 3 levels of yoga practice were conducted: (1) never practiced yoga, (2) practiced less than one year, and (3) practiced more than one year. Each group was reported to be similar with respect to age, gender, and ethnicity. Economic data were not obtained; however, most participants were assumed to be upper-middle class according to the authors. Participants included 36 yoga practitioners of whom 10% were African American (*n* =3) or Asian (*n* =2), and 14 non-practitioners of yoga of whom 30% (*n* =5) were African American. In the yoga practitioner group, 85% were female, and in the non-practitioner group gender was equally balanced at 50% female and male. Regardless of whether or not participants practiced yoga, all perceived the benefits of yoga as health promotion, disease prevention, increased physical functioning, and amelioration of stress-related illness. Perceived barriers to yoga practice that were suggested by both practitioners of yoga and non-practitioners alike were time constraints, cost of classes, negative perceptions and assumptions about alternative life styles, worsening of existing musculoskeletal conditions, and risk of muscle strain. Beginning practitioners reported that they experienced immediate health benefits from yoga practice such as better sleep patterns and reduced levels of anxiety. The findings of this study suggest a general consensus in the perceived health and well-being benefits of yoga practice among multi-ethnic practitioners and non-practitioners of yoga alike, and lend support for the acceptance of yoga among ethnically diverse women who have never practiced yoga, as was demonstrated in this study.

Interest in yoga practice among African Americans is increasing as the benefits of yoga as a means to alleviate stress, promote health, and combat chronic illness are becoming known within this community. The impact of yoga practice in a medically diverse, multiethnic

population of breast cancer patients was examined by Moadel et al. (2007). In the sample of 128 women, 42% were African American and 31% were Hispanic. The rest were classified as non-Hispanic White (23%) and other (4%). Breast cancer patients with the following criteria were recruited from an urban cancer center: diagnosis of new or recurrent breast cancer in stages I to III, diagnosed within the previous year, English and Spanish speaking, and not currently practicing yoga. Participants were randomly assigned to yoga intervention that consisted of twelve 1.5-hour weekly classes of stretching, asanas (poses), breathing exercises, and meditation, or to a 12-week waitlist. In addition to attending yoga classes, participants in the intervention group were asked to practice yoga at home daily and were given an audiotape or compact disk for guidance. Women in the intervention group (*n* = 84*)* and in the control group (*n* = 44) completed quality of life assessments at baseline and at 1, 3, and 6 months. Quality of life was measured using the Functional Assessment of Cancer Therapy (Cella, Tulsky, Gray, Sarafian, Linn, Bonomi, et al., 1993); the Functional Assessment of Chronic Illness Therapy-Spiritual (Peterman, Fitchett, Brady, Hernandez, & Cella, 2002), and the Distressed Mood Index (Moadel et al., 2007). Adherence with the treatment regimen was classified as high (attended more than six yoga classes, *n* = 33), low (attended one to six classes, *n* = 24), and no adherence (did not attend any classes, *n* = 27). Of the women in the intervention group who did not attend yoga classes, 56% were Hispanic, 26% were African American, and 17% were Caucasian. In spite of variability in adherence to the 12-week intervention, emotional well-being, social functioning, spiritual well-being, and distressed mood were all significantly greater in the intervention group, especially among women not receiving chemotherapy. The greatest impact of the yoga intervention was on social functioning. The acceptance of yoga practice in ethnically

diverse women in this study is a positive finding that lends support for the acceptance of yoga practice among multiethnic women, as was found in this study.

Yoga Practice during Pregnancy

Although yoga practice among pregnant women is increasing, a relatively small body of research has been disseminated in this area. In the developing research of yoga practice during pregnancy, findings suggest that yoga may contribute to fewer pregnancy-related discomforts and improved birth outcomes.

Support for the efficacy of yoga practice in improving pregnancy outcomes in low- and high-risk pregnancies is emerging through the discovery of changes in physiologic parameters as a result of yoga practice. Narendran, Nagarathna, Narendran, et al. (2005) examined the efficacy of Integrated Approach Yoga Therapy (IAYT) consisting of deep relaxation, postures, controlled breathing, and meditation, for improving birth outcomes among 335 primiparous and multiparous women assigned to an intervention or control group based on the distance that each woman lived from the hospital. The intervention group was composed of women who lived closest to the hospital. Women in the study were between 18 to 35 years of age with a singleton pregnancy and reported no previous yoga training. All women were between 18 to 20 weeks gestation upon entrance into the study. Women with medically complicated pregnancies or a previous history of pregnancy loss due to genetic defects or intrauterine infection were excluded. Both intervention and control groups were matched for age, parity, body weight, and umbilical and uterine artery Doppler velocimetry scores. Women in the intervention group practiced physical postures, breathing techniques, and meditation for one hour daily from the date they entered into the study until delivery. The control group walked 30 minutes twice daily during the study period. Adherence in both groups was assured through frequent telephone conversations

and maintenance of an activity diary. Women in the intervention group had a significant decrease in preterm deliveries (14% as compared to 29% in the control group) and a decreased number of small-for-gestational-age infants (19% and 31% respectively). The incidence of pregnancy-induced hypertension and emergency cesarean birth tended to decrease in the intervention group, but the differences, while clinically important, were not statistically significant. No adverse events related to yoga practice were noted in the intervention group. The findings of this study support the safety and efficacy of yoga practice in women with low-risk pregnancies, as was found in this study.

Yoga practice is posited to result in improved health through a favorable effect on autonomic nervous system responses to stress. In a prospective, randomized study, Satyapriya, Nagendra, Nagarathna, and Padmalatha (2009) examined the effect of Integrated Approach Yoga, described as physical postures, breathing techniques, meditation, relaxation techniques, and guided yogic relaxation on perceived stress and autonomic response, as measured by heart rate variability, in 90 primiparous and multiparous women at 18 to 36 weeks gestation whose pregnancies were uncomplicated. The women were assigned to an intervention group consisting of yoga practice using a module developed specifically for healthy pregnant women or to a control group in which women practiced standard prenatal exercises, such as stretching. The yoga intervention included positions, breathing techniques, meditation, and relaxation techniques as well as 15- minute lectures and yogic counseling sessions. During the first month, both the intervention and control groups learned movements from trained instructors in 2-hour sessions 3 days per week. After 1 month, participants practiced yoga daily for 1 hour at home using a pre-recorded instruction audiocassette. Both the intervention and control groups had a 1-hour refresher class at each prenatal visit up until 36 weeks gestation. Adherence was assured by

telephone calls and maintenance of an activity diary. Perceived stress was measured by the women's responses to a perceived stress scale developed by the authors, and autonomic response was measured by heart rate variability during relaxation as determine through electrocardiogram recording. Perceived stress decreased by 31.6% in the yoga group and increased by 6.6% in the control group, a statistically significant finding (p <0.001). The yoga group demonstrated statistically significant positive autonomic nervous system responses in the third trimester which manifested as reduced sympathetic tone, improved parasympathetic tone, and increased autonomic balance as observed by continuous electrocardiographic heart rate recording compared to the responses of the control group. The authors concluded that a structured yoga program and regular yoga practice resulted in improved physical health during pregnancy.

Yoga practice may improve outcomes in women with high-risk pregnancies as well as those at low risk for adverse pregnancy outcomes. In a subsample of a larger study, Narendran, Nagarathna, Gunasheela, and Nagendra (2005) examined the efficacy of IAYT practice, described as postures, breathing techniques, and meditation, in 121 primiparous and multiparous women between 18 to 20 weeks with pregnancies complicated by abnormal Doppler velocimetry. Women in the intervention group (n=68) and control group (n=53) were matched for age, parity, and Doppler velocimetry scores of the umbilical and uterine arteries. The intervention and control group activities were as described in the previously mentioned study by the lead authors. Birth weight in the intervention group was significantly higher (2.8 $\pm$ 0.52 kg) than in the control group (2.6 $\pm$ 0.52 kg, p < 0.02). While not statistically significant, pregnancy-induced hypertension, intrauterine growth restriction, emergency cesarean birth, and fetal demise all trended lower in the yoga group. Even though women in this study were considered at high-

risk for adverse pregnancy outcomes, yoga practice was not found to be detrimental and in fact may have offered protection against select adverse pregnancy outcomes.

Nurse-midwives and other health care providers commonly counsel women about therapies to relieve pregnancy-related discomforts and prepare for the experience of childbirth. Beddoe, Yang, Kennedy, Weiss, and Lee (2009) examined the relationship of mindfulness-based yoga practice during pregnancy on physical and psychological distress, and explored the possibility of using mindfulness during childbirth among a community sample of 16 healthy primiparous women between 13 to 32 weeks gestation. Mindfulness-based yoga was described as a combination of the postures of Iyengar (1979) yoga and the mindfulness-based stress reduction curriculum developed by Kabat-Zinn (1990). According Beddoe et al. (2009), mindfulness is a "purposeful process of learning how to pay attention from moment-to-moment to one's present experience while noticing and learning to let go of judgments and reactivity" (p. 313). Participants were middle-class, college educated, and married with an average age of 30.4 years. The nationality and ethnic characteristics of the women were not described. Baseline and post-intervention measures of perceived stress as measured with the 10-item Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) and the Prenatal Psychosocial Profile stressor subscale (Curry, Burton, & Fields, 1998); trait anxiety as measured with the trait subscale of the State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1989); pain as measured using a modified version of the Brief Pain Inventory (Daut, Cleeland & Flanery, 1983); and morning salivary cortisol concentrations for three consecutive days were obtained before the first day of the intervention and immediately upon completion of a 7-week program of weekly yoga sessions. Mindfulness-based yoga intervention and mindfulness-based stress reduction as described was utilized. Each session was 75 minutes in duration and consisted of

progressive relaxation, sitting meditation, yoga postures modified through the use of props to suit individual needs and limitations, and walking meditation. The sessions also included instruction in daily mindfulness practice, a discussion of physical and psychological effects of stress, and conversation related to the potential use of mindfulness during birth. Most participants in this study reported practicing yoga and mindfulness skills outside of class, although the frequency and duration of practice was not measured. The authors found that while pain was common among all women, women in the second trimester experienced less pain duration and interference with daily activity post-intervention than at baseline, whereas women in the third trimester did not experience a reduction in pain. Trait anxiety decreased significantly post-intervention as did perceived stress, whereas changes in state anxiety and pregnancy-related stressors did not reach significance. There was no significant effect on cortisol levels noted post-intervention. This study is reported by the authors to be the first to examine Iyengar (1979) yoga practice during pregnancy, highlighting the dearth of knowledge in this area and the need for further exploration of the efficacy of yoga practice during late pregnancy, as was accomplished in this study.

Sleep disturbance during pregnancy is relatively common, and the effects of poor sleep during pregnancy can be detrimental to both maternal and fetal health (Chang, Pien, Duntley, & Macones, 2009; Parry, Martínez, Maurer, López, Sorenson, & Meliska, 2006). The effect of a 7-week mindful yoga intervention on sleep quality was explored by Beddoe, Lee, Weiss, Kennedy, and Yang (2010) in 15 women who were between 19 and 36 weeks gestation. All women were pregnant with their first child. Most women were middle-class, married, and college educated, and about half reported working full-time. None were obese, and all denied tobacco or prescription or recreational drug use. Though none of the women reported current mental health

problems, 20% reported a history of depression or anxiety in the past. The mindfulness-based yoga intervention used in this study combined Iyengar (1979) principles with the mindfulness-based stress reduction curriculum (Kabat-Zinn, 1990) as previously described in the aforementioned study by the same authors. Participants attended class for 2 hours once per week and were instructed to practice yoga at home at least five times per week between group sessions. Most women reported practicing an average of two times per week. Sleep disturbance was measured by the General Sleep Disturbance Scale (GSDS) (Lee, 1992) and actigraphy, a non-invasive method of measuring rest and activity cycles. Each participant wore a wrist actigraph for 72 consecutive hours at baseline and upon completion of the 7-week intervention to measure sleep-wake time and rhythms. The authors found that women who began mindfulness-based yoga practice in the second trimester improved sleep efficiency as manifested by improved GSDS scores from pre- to post-intervention (Z = -1.96, p = .02); however, women who began the intervention in the third trimester did not. The findings of this study support that more research is needed about the efficacy of yoga practice in improving sleep during late pregnancy.

While Beddoe et al. (2009) did not find that women in late pregnancy experienced a reduction in pregnancy-related pain as a result of yoga practice others have found a relationship between yoga practice and the reduction of physical discomforts in late pregnancy and improved childbirth self-efficacy. The effects of yoga practice on pregnancy-related discomforts and childbirth self-efficacy among Chinese women was explored by nurse-midwives caring for women in the third trimester of pregnancy. Sun, et al. (2009) recruited 45 primiparous women with low-risk pregnancies at 26 to 28 weeks gestation from a large urban prenatal clinic in a Taipei, Taiwan hospital to participate in a yoga intervention. Women age 18 and above who had

not exercised within the previous year and had no prior yoga experience were invited to participate in the study. The control group consisted of a different group of women (n = 43) who had received standard prenatal care in the 3 months prior to the yoga intervention. The yoga intervention consisted of a 10-page booklet, a 30-minute videotape program developed by the investigators after a review of the literature, and follow-up telephone calls to inquire about adherence to the program. The yoga program included nine "exercises" and a period of meditation for a total of 1 hour. Women in the intervention group were asked to practice the yoga program at home at least three times a week for 12 to 14 weeks. In addition to demographic information, data from both the intervention and control groups were collected at 38-40 weeks gestation and following childbirth about pregnancy-related discomforts and childbirth self-efficacy using the Childbirth Self-efficacy Inventory, a tool based upon Bandura's (1994) self-efficacy theory (Sun et al., 2009). The authors found that while there was no significant difference in pregnancy discomforts between the control and experimental groups at 26-28 weeks gestation, there was a significant difference in pregnancy discomforts at 38-40 weeks (Z = *-2.38, p* = .01) between the groups, with women in the yoga group reporting improvement in pregnancy-related discomforts. Compared with the control group, women in the yoga intervention group reported a statistically significant increase in childbirth self-efficacy during active and second stage of labor. The findings of this study suggest that yoga practice is beneficial to promoting a sense of physical well-being and confidence about childbirth.

Prenatal yoga practice is posited to favorably impact pain tolerance during labor and contribute to positive birth outcomes. Chuntharapat, et al. (2008) examined the effects of a prenatal yoga program on maternal comfort, labor pain, and birth outcomes in 74 low-risk, primiparous Thai women. Participants were randomly assigned to a yoga intervention group

consisting of a series of six, 60-minute yoga practice sessions at the 26th-28th, 30th, 32nd, 34th, 36th, and 37th week of gestation. Yoga sessions were a combination of educational activities, yoga asanas (positions), chanting, breathing awareness, and relaxation. In addition to the scheduled educational and practice sessions, women were asked to practice at home at least three times a week for a period of 10 to 12 weeks and were given a booklet and audiocassette for self-study. Participants kept a diary of their yoga practice and received weekly telephone calls from the investigators. The control group received standard nursing care and 20 to 30 minutes of "casual conversation" from the investigators in addition to weekly phone calls from the investigators. Participants completed the State-Trait Anxiety Inventory (Spielberger et al., 1989) at the beginning of the study and the visual analogue scale to total comfort, a modified version of the Visual Analogue Scale for Comfort (Kolcaba, 2003) during the first stage of active labor at 3-4 centimeters dilatation and every 2 hours thereafter for a total of 3 measurements. At two hours following birth, the participants completed a maternal comfort scale developed by the researchers to indicate level of comfort. Participants also completed two additional pain scales at the same time they completed the visual analogue scale to total comfort during active labor. Birth outcomes measured in the study were Apgar scores, length of labor, and birth weight. The researchers found that women in the intervention group demonstrated significantly higher maternal comfort during labor and reported significantly lower labor pain scores than the control group. The duration of the first stage of labor was significantly less in the intervention group; however, there was no difference between groups in the length of second stage labor. There was also no difference in the use of labor augmentation between the intervention and control group, and birth outcomes were not significantly different between groups. As in the study by Sun et al.

(2009), women in the yoga intervention group had significant contact with yoga instructors, thereby increasing the likelihood of safe and effective yoga practice among study participants.

Women commonly report the use of complementary alternative therapies during pregnancy, including yoga. Wang, DeZinno, Fermo, William, Caldwell-Andrews, Bravemen, & Kain (2005) surveyed the use of complementary alternative therapies for low-back pain during pregnancy in a predominantly White (80.1%), economically diverse sample of women in New Haven County, Connecticut. The majority of women (75.1%) who responded to the survey were in the third trimester of pregnancy. Participants were asked about their past and present experiences with complementary alternative therapies, including yoga practice. Of the respondents who reported the use of complementary alternative therapies during pregnancy (*n*=295), 18.3% used yoga. Differences in age, income, or ethnicity among alternative therapy users and non-users were not statistically significant; however, educated women were more likely to accept the use of alternative therapies as a therapeutic option for low back pain compared to less educated women. Most respondents (74.5%) who reported the use of alternative therapies for low back pain stated that they would not accept medication for their discomfort. The findings of this study indicate the widespread acceptance and use of alternative therapies for common discomforts of pregnancy. Yet women are reluctant to share information about their use of alternative therapies with their providers, and providers are hesitant to ask about the use of complementary and alternative therapies (Wang et al., 2005). It is imperative that health care providers who care for women are knowledgeable about safe and effective alternatives to pharmacologic treatment of pregnancy-related discomforts and that they accept a woman's choice to use wholesome, safe, and reliable alternative options.

Summary

This review of the literature has elucidated the current state of knowledge about the theoretical interpretation and measurement of the Rogerian science-derived variables of power and well-being. The role of optimism in well-being during pregnancy was explored.

Well-being coveys a holistic understanding of people as they interact within their environment and therefore is a more appropriate term than health as applied to nursing (Rogers, 1994). Health-related variables unique to Rogerian science, such as perceived field motion and human field rhythms, are posited to contribute synergistically to a sense of well-being. Evidence suggests synergy in the relationship between power (Barrett, 1986) and well-being (Gueldner et al., 2005; Kim et al., 2008) as measured by instruments derived within the Rogerian science conceptual framework.

The construct of optimism as unitary is not specifically expressed in the writings of Martha Rogers. However, Rogers acknowledged that the SUHB conceptual system is an evolving framework in which "a humane and optimistic view of life's potentials grows as a new reality appears" (Rogers, 1986, p. 4). Although the review of the literature revealed that optimism has emerged from a number of studies of pregnant women focused on the negative aspects of health, such as stress and depression, the findings of these studies support optimism in a positive light as being beneficial to well-being during pregnancy (Brissette et al., 2002; Scheier & Carver, 1987).

Yoga is a holistic practice that fully integrates the human-environmental field processes in the promotion of health and prevention of infirmity. The review of the literature highlights a number of studies that support the health promotional benefits of yoga practice. The findings affirming the positive effects of yoga practice suggest that it is an ideal path to promote

optimism, health, and well-being during pregnancy and is therefore congruent with the philosophical perspective and therapeutic aims of the SUHB.

The review of the literature highlights studies that support the need for this beginning descriptive study that explored yoga practice and changes in optimism, power, and well-being during pregnancy within Rogerian science. The SUHB is a nursing model that provides a holistic worldview and proposes an optimistic view of women's experience of pregnancy.

CHAPTER 3

METHODOLOGY

Introduction

The purpose of this study was to explore changes in human-environmental field patterning of optimism, power, and well-being over time in women during the second and third trimesters of pregnancy upon completion of a 6-week prenatal yoga program. The research questions were:

1) What are the changes in patterning, as observed through the manifestation of optimism, power, and well-being over time, in women before beginning and upon completing a 6-week prenatal yoga program during the second and third trimesters of pregnancy?

2) Does change in patterning, as observed through the manifestations of optimism, power, and well-being over time, differ for women beginning yoga classes in the third trimester from women who begin classes in the second trimester of pregnancy?

Design

The variables of optimism, power, and well-being were measured using a correlational, one-group, pre- and post-treatment survey design. Research designs that focus on identifying unique changes in patterning such as correlational designs are congruent with the Rogerian science theoretical framework used in this study (Cowling, 1986; Fawcett, 1996). Rogers (1992) maintained that basic and applied research approaches are necessary for knowledge building about phenomena unique to the Science of Unitary Human Beings (SUHB) and that quantitative method and descriptive approaches are appropriate methodologies for knowledge development. Since optimism is a widely reported variable that was measured in this study, power was calculated using Cohen's (1988) paired-samples t-test formula and the means and standard

deviations of the Life Orientation Test-Revised (LOT-R) scores as reported in the literature. Using a significance level of .05, power of .80, effect size of .50, and an estimated correlation of the paired LOT-R scores of .50, a sample of 31 participants was required for testing the LOT-R mean differences using the paired t-test (Cohen, 1988).

There were barriers to achieving a sample size that met the stated criteria for power. Among these barriers was attrition due to pregnancy-related complications and not being able to accommodate women who were interested in participating in the study but could not once classes became full and at their maximum capacity. The sample characteristics are described in the following section.

Sample Characteristics

A convenience sample of 27 pregnant women meeting the delimitations of this study was recruited from a public health prenatal clinic and a private nurse-midwifery practice in Wake County, North Carolina. The sample was delimited to women who volunteered to participate in the study and were (a) in the second and third trimesters of pregnancy between 20 to 32 weeks gestation; (b) 18 years old and above; (c) able to speak, read, and write in English; and (d) experiencing an uncomplicated, low-risk pregnancy. The inclusion criteria chosen for the study were based on the review of literature and were consistent with other studies of yoga practice during pregnancy.

Of the 27 women who consented to participate in the study, 21 participated in yoga classes for 6 weeks and completed the study instruments 1 to 2 weeks before beginning classes (Time 1) and at 1 to 2 weeks following the completion of yoga classes (Time 2). The demographic characteristics of the participants are presented in Table 1.

Table 1

Participant Demographic Characteristics (*n* = 21)

	Range	***M***	***SD***
Age	22-38	30.28	5.01
Gestational age	21-32	26.85	3.95

	n	**%**
Marital Status		
Married	13	61.9
Single not living with partner	6	28.6
Single living with partner	2	9.5
Nationality		
White	11	52.4
Black/African American	3	14.3
American Indian/Alaska Native	1	4.8
Latina/Hispanic/Spanish origin	3	14.8
Asian	1	4.8
Multiethnic	2	9.5
Employment		
Full-time (40 hrs/wk)	7	33.3
Part-time (< 40 hrs/wk)	6	28.6
Not Employed	8	38.1
Education		
High school or less	2	9.5
High school graduate	5	23.8
Associate's degree	3	14.3
Bachelor's degree	4	19.0
Graduate school, no degree	2	9.5
Graduate degree	5	23.8
Doctorate degree		
Annual Family Income		
< 20,000	6	28.6
$\underline{\leq}$ 40,000	5	23.8
> 40,000	10	47.6
Parity		
0	10	47.6
1	7	33.3
2	2	9.5
3	2	9.5

The 21 participants in the final sample ranged in age from 22 to 38 years (*M* =30.28; *SD* = 5.01). Thirteen (61.9%) were currently married, 6 (28.6%) reported being single and not living

with the father of their child, and 2 (9.5%) were single and living with a partner. The gestational age of the participants at entry into the study ranged from 21 to 32 weeks (M = 26.85 weeks; SD = 3.95), and the gestational age at which participants completed yoga classes ranged from 26 to 37 weeks (M = 32.44 weeks; SD = 3.69). Most participants (47%; n = 10) were pregnant with their first child, 7 (33%) had one child, 2 (10%) had 2 children, and 2 (10%) had 3 children. Approximately 52% (n = 11) of participants were White, whereas 3 (14%) were African American/Black, 3 (14%) were Latina/Hispanic, 2 (10%) were multiethnic, 1 (5%) was American Indian/Alaska Native, and 1 (5%) was Asian. Approximately 9% (n = 2) of participants did not graduate from high school, 5 (24%) were high school graduates, 3 (14%) had associate's degrees, 4 (19%) had bachelor's degrees, 2 (10%) attended graduate school, and 5 (24%) had a master's degree. Approximately 33% (n = 7) reported being employed full-time, 6 (29%) were employed part-time, and 8 (38%) were not employed. Ten of the participants (47%) reported an annual family income of greater than $40,000, 5 (24%) reported a family income of less than or equal to $40,000 per year, and 6 (29%) reported their annual family income was less than or equal to $20,000 per year.

The majority of women (approximately 62%, n = 13) reported that they were currently exercising. Of the women who exercised, approximately 11 (52%) reported walking for exercise, 1 (5%) reported running, and 1 (5%) reported participating in aerobic exercise. About 38% (n = 8) of study participants reported that they did not exercise.

Twelve of the participants (57%) reported having practiced yoga in the past; however, none of the women were currently practicing yoga. Although none of the study participants reported that they were currently practicing yoga, 5 (24%) reported that they were currently using, or have in the past used, breath work and breathing techniques for relaxation and stress

relief, 4 (19%) reported using relaxation techniques in the past, and 4 (19%) reported using massage in the past.

Instruments

Demographic Data Form

A demographic data form to collect descriptive information on the participants such as age, nationality, education, income, marital status, employment status, gestational age, parity, level of exercise, previous yoga experience, previous and concurrent use of CAM, general perceived health status, and problems incurred during the pregnancy was included to obtain a description of the sample (see Appendix B).

Life Orientation Test-Revised (LOT-R)

The Life Orientation Test-Revised (LOT-R) (Scheier et al., 1994) is a ten-item self-report instrument consisting of six items to derive an optimism score and four filler items that are eliminated from the statistical analysis. The theoretical framework from which the LOT-R is derived is behavioral self-regulation, which assumes that expectancies about likely outcomes determine whether or not individuals strive to pursue goals, rather than withdraw or disengage from goals that are viewed as unattainable (Carver & Gaines, 1987; Scheier & Carver, 1985). Within this paradigm, individuals hold general expectancies about the holistic quality of their lives, and optimism is beneficial to learning to cope with change. Scheier et al. (1994) developed the LOT-R to assess individual differences in generalized optimism versus pessimism. The LOT-R is a modification of the Life Orientation Test (LOT) first developed by Scheier and Carver in 1985 (Scheier & Carver, 1985). According to Carver and Scheier (2003), the LOT-R focuses more explicitly on expectations for the future as dictated by the theory that guided the development of the LOT.

Examples of items composing the LOT-R are: "In uncertain times, I usually expect the best" and "If something can go wrong for me, it will" (Scheier et al., 1994, p. 1073). Respondents are asked to indicate their level of agreement with each item on a Likert scale with items scored as follows: 0 = strongly disagree; 1 = disagree; 2 = neutral; 3 = agree; and 4 = strongly agree. Negatively worded items are reverse coded before scoring. A summary score of the six scale items is calculated after removing the four filler items and scores, resulting in a range of scores from 0 to 24. There are no "cut-off" scores or a specific criterion for optimism and pessimism, and higher scores are associated with greater optimism.

The psychometric properties of the LOT-R were tested among 2,055 undergraduate students (622 women, 1,394 men, and 39 participants who did not state their gender) at Carnegie Mellon University from 1990-1993. To examine the convergent and discriminant validity of the LOT-R, subjects were asked to complete several different questionnaires in addition to the LOT-R. Item scale correlations ranged from .43 to .63, and all six items added equivalently to the Cronbach's alpha of .78, which suggests that each item measures the same underlying construct without redundancy with other items. Following confirmatory factor analysis of the LOT-R, the authors concluded that the six-scale items are unidirectional as a single optimism factor (Scheier et al., 1994). Test-retest correlations reported in the LOT-R developmental process at 4 months, 12 months, 24 months, and 28 months were .68, .60, .56, and .79 respectively, which suggests that the internal consistency of the LOT-R in the developmental stage sample was not highly stable across time (Scheier et al., 1994). Hirsch, Britton, and Conner (2009) established a LOT-R test-retest reliability correlation of .72 within a 24-day mean interval in opiate-dependent individuals enrolled in a substance abuse treatment program.

The LOT and LOT-R have been shown to have high reliability among pregnant women, with Cronbach's alpha .81 to .85 (Grote & Bledsoe, 2007; Killingsworth-Rini, Dunkel-Shetter, Wadhwa, & Sandman, 1999; Lobel et al., 2002; Moyer, Yang, Kwawukume, Gupta, Zhu, Koranteng, et al., 2009; Park et al., 1997). According to Scheier et al. (1994), the correlation between the LOT-R and the original LOT is high (r =.95) because of extensive overlap between original scale and revised scale items.

Mean scores and standard deviations for the LOT and LOT-R scale items in studies of pregnant women are 16.7 (*SD*=4.13) for the LOT (Moyer et al., 2009) and 21.6 (*SD*=4.9) for the LOT-R (Nelson et al., 2003). The instrument is available through the University of Miami Department of Psychology website, and permission to use the LOT-R from the authors is not required. The reliability of the LOT-R in terms of how well the instrument performed in this study is presented in Chapter 4: Data Analysis. A copy of the LOT-R is in Appendix C.

Power as Knowing Participation in Change Tool Version II (PKPCT v II)

The Power to Knowingly Participate in Change Tool Version II (PKPCT v II) (Barrett, 1986, 2003) is a seven-point semantic differential scale used to measure the operational indices of power manifested as awareness, choices, freedom to act intentionally, and involvement in creating change. The theoretical definitions of these four indicators of power are described in Chapter 1. The PKPCT v II has four subscales of 12 bipolar adjective pairs and one repeat adjective pair as a retest reliability item. Participants are instructed to make a separate rating for each adjective pair by checking the space that best reflects the meaning of the concept to them. Each space on the scale represents a numeric value of 1 to 7. Scale scores are summed with a range of scores from 12 to 84 for each power concept and 48 to 336 for the total power score. Mean scores for general populations vary widely, ranging from 67-336 (Epstein, Halper, Barrett,

Birdsall, McGee, Baron, & Lowenstein, 2004; Kim et al., 2008). Studies reporting the use of the PKPCT v II in pregnant women were not found. Lower PKPCT v II scores indicate lower power, and higher scores indicate higher power. Adjective pairs are reversed randomly throughout the PKPCT v II. An example of adjectives indicating higher power are "profound," "seeking," "valuable," and "expanding," and corresponding examples of adjectives indicating lower power are "superficial," "avoiding," "worthless," and "shrinking" (Barrett, 2003, p. 32).

The PKPCT v II is reported to be a reliable measure of power, with Cronbach's alpha most often reported to be above .85 (Barrett, 2003; Caroselli & Barrett, 1998; Kim et al., 2008). Test-retest reliability range of .61 to .78 within a 3-week interval has been reported in a population of undergraduate students (Barrett, 1998, 2003). According to a review of the PKPCT literature by Caroselli and Barrett (1998), construct validity of the PKPCT in samples of healthy adults has been demonstrated by positive and statistically significant relationships between power and well-being, human field motion, life satisfaction, purpose in life, self-transcendence, spirituality, perceived health, and other measures of health and well-being. Inverse relationships of power with personal distress, anxiety, chronic pain, and hopelessness have also been reported (Barrett, 2003; Caroselli & Barrett, 1998). The PKPCT v II requires a minimum of a high school education due to the literacy level of the adjectives (Barrett & Caroselli, 1998). Permission to use the PKPCT v II in this study was granted by the author. The reliability of the PKPCT v II as it performed in this study is presented in Chapter 4: Data Analysis. A copy of the PKPCT v II and PKPCT v II scoring guide is in Appendix D.

Well-Being Picture Scale (WPS)

The Well-Being Picture Scale (WPS) (Gueldner et al., 2005) is a 10-item pictorial scale that measures general well-being based on characteristics of field energy motion that are posited

to represent well-being. Conceptually, the instrument appraises the energy field in regard to frequency and intensity of movement, awareness of oneself as energy, action emanating from the energy field, and power as knowing participation in change within the integral human and environmental energy field process (Gueldner et al., 2005). Each item on the scale has a numeric value of 1 to 7, with 70 being the maximum score possible and 10 being lowest score possible. Higher scores indicate higher well being.

The psychometric properties of the WPS were established in a sample of 1,027 individuals from the United States, Taiwan, and Japan (Gueldner, 2007; Gueldner et al., 2005). Gueldner et al. (2005) reported that the item-to-total correlations on the 10-item WPS in the sample of 1027 individuals ranged from .3585 to .7086, with an overall Cronbach's alpha of .88. The reliability of the WPS by Cronbach's alpha coefficient in studies published to date has been .84 to .88 (Gueldner et al., 2005; Kim et al., 2008; Reis & Alligood, 2008). Reis and Alligood (2008) reported an overall Cronbach's alpha of .88 and a mean WPS scores from 42.15 to 52.75 in a sample of 55 multiethnic pregnant women. The instructions for completing the WPS in that study were translated into Spanish for the Hispanic participants. The Cronbach's alpha for Hispanic women in that study was .67.

Permission to use the WPS in this study was granted by the author. The reliability of the WPS in this study is presented in Chapter 4: Data Analysis. A copy of the WPS and WPS scoring guide is in Appendix E.

Short-Form 12 Version 2.0 (SF-12v2)

Because there is limited data on the reliability and validity of the WPS as a measure of well-being, especially in pregnant women, the Short Form-12 Version 2 (SF-12v2) Physical Component Summary (PCS) and Mental Component Summary (MCS) as composite measures of

well-being were used in this study as auxiliary measures of well-being and perceived health. The PCS and MCS as composite measures represent the synthesis of several dimensions of health that contribute to a sense of well-being. An integrated view of health, as reflected in the PCS and MCS measures, is congruent with the SUHB when conceptualized as a manifestation of well-being from a Rogerian science perspective.

The SF-12v2 (Ware, Kosinski, & Keller, 1996) is a shorter alternative to the Short-Form 36 (SF-36), (Ware & Sherbourne, 1992) and is replacing the SF-36 as the instrument of choice in population surveys that require a shorter instrument (Ware et al., 1996). The SF-12v2 contains 12 items from the SF-36 Health Survey that measure each of the eight domains of health included in the SF-36. The SF-12v2 is available in standard (4-week) and acute (1-week) recall formats. The 4-week recall version was chosen for this study since the Time 2 survey was administered at 1 to 2 weeks following the 6-week yoga program. The SF-12v2 allows for calculation of an eight-scale profile: physical functioning, role functioning, bodily pain, general health, vitality, social functioning, role-emotional, and mental health, in addition to two summary scores – the physical component summary (PCS) and the mental component summary (MCS). The PCS score addresses physical functioning, role-physical, bodily pain, and general health, and the MCS score addresses vitality, social functioning, role-emotional, and mental health domains of the SF-12 v2. Summary component scores range from 0 to 100 and are calculated using the scores of the 12 scale items; higher scores represent greater health. Standardized norm-based scoring algorithms allows comparison to the national norms for the general United States population (M=50, SD=10) for all of the Short-Form surveys (Ware, Kosinski, Turner-Bowker, & Gandek, 2009).

The psychometric properties of the SF-12v2 questionnaire have been extensively evaluated in many different populations (Ware et al., 2009) including pregnant women (Amador, Juarez, Guízar, & Linares, 2008; Lacasse & Bérard, 2008; Lacasse, Rey, Ferreira, Morin, & Bérard, 2008; & Moyer et al., 2009). The SF-12v2 PCS mean scores for women in the third trimester of pregnancy range from 42.84 (*SD*=9.07) to 44.32 (*SD*=9.20), and the MCS mean score range is 45.88 (*SD*=8.38) to 50 (*SD* not reported) (Amador et al., 2008; Lacasse & Bérard, 2008; Lacasse et al., 2008; & Moyer et al., 2009). The SF-12 v2 is highly reliable; the PCS Cronbach's α = .89, and the MCS Cronbach's α =.86, with test-retest (2-week) correlations for the PCS .89 and the MCS .76 (Ware et al., 1996). The SF-12v2 has shown a high degree of correspondence and good criterion validity between summary scores as compared to the SF-36 (PCS = .94 to .96; MCS = .94 to .97) (Ware et al., 2009). The instrument was made available, and permission to use the SF-12v2 from the authors was obtained. Computation of the index of reliability of the SF-12v2 in this study is presented in Chapter 4: Data Analysis. A copy of the SF-12v2 4-week recall version is in Appendix F.

Procedure

Research ethics approval was granted for this study from the East Carolina University and Medical Center Institutional Review Board (UMCIRB), Wake County Human Services (WCHS) Prenatal Clinic, and Triangle Obstetrics and Gynecology. All requirements pertaining to these approvals were met. Informed consent was obtained as per UMCIRB protocol utilizing standardized forms and instructions provided by UMCIRB. The UMCIRB study approval letters and participant consent form are in Appendix A.

Study participants were solicited at their scheduled prenatal appointments through a flyer kept in the examination rooms at their prenatal care provider's clinic or office. The flyer (see

Appendix K) described the study and included instructions about how to contact the investigator for further information and consent to participate.

All potential participants who met the inclusion criteria for the study were asked by the investigator to sign a consent form informing them of their rights and responsibilities as a research study participant. Written permission to participate in prenatal yoga practice from the participants' health care providers was also obtained for each participant. Those who agreed to participate in the study by signing a written consent form responded to the study instrument packet ordered as follows: (a) Demographic Data Form, (b) WPS, (c) LOT-R, (d) PKPCT v II, and (e) SF-12v2. The study instrument packet was administered at 1 to 2 weeks prior to beginning yoga classes (Time 1) and at 1 to 2 weeks after the conclusion of the 6-week yoga classes (Time 2). The Demographic Data Form was collected once upon enrollment into the study. The Time 1 study instrument packet was given to participants at their prenatal appointment, mailed to participants with a return postage-paid envelope, or sent by email attachment by the investigator. The Time 2 study instrument packet was either mailed or sent via email attachment to the participants by the investigator. In addition to completing the study instrument packets at Time 1 and Time 2, participants were given a yoga journal to record their daily experience of yoga practice for 6 weeks. The journal included space to record the date, amount of time spent practicing yoga, whether or not they attended class, and how they felt after practicing yoga. Space was also provided for the participants to record additional thoughts and feelings about their yoga experience. Prior to attending the first yoga class, each participant was given a yoga mat by the investigator that was theirs to keep. Upon completion of the 6-week yoga session, participants returned the yoga journals to the investigator. In addition, each participant was interviewed by phone and was given this prompt: "Describe the experience of

practicing yoga during this pregnancy. Include as much as you can about your perceptions, feelings, sensations, and behaviors. Include any changes or surprises that you've experienced." Participants who completed all phases of the study received $25.00 in cash or by a cashier's check for their participation.

Of the 27 women who consented to participate in the study, six withdrew from the study prior to completing the 6-week yoga program. Three withdrew because of pregnancy-related complications: one withdrew after three classes because of pelvic pain; one withdrew after two classes due to vaginal bleeding, and one withdrew after one class upon receiving a diagnosis of placenta previa. Three participants did not follow through with attending yoga classes after submitting the study packet at baseline.

Each participant attended the Healthy Moms® prenatal yoga program once a week consecutively for six weeks at one of three Healthy Moms® yoga studio locations. The time frame of 6 weeks for prenatal yoga practice sessions was selected based upon a review of the literature that described the duration of instructor-led yoga classes from 1 month (Satyapriya et al., 2009) to 12 to 14 weeks (Sun et al., 2009) and beyond. Healthy Moms® conducts quarterly yoga class sessions that run for a total of 12 weeks. Since the class sessions are not progressive or dependent upon attendance at previous sessions, study participants achieved the same level of instruction throughout their 6 weeks of participation regardless of when during the 12-week session they enrolled for classes. Classes were paid for by the investigator with research awards from the Martha E. Rogers Scholars Fund and Sigma Theta Tau International, Beta Nu Chapter. Participant attendance was verified by cross-checking the class attendance lists provided by the two Healthy Moms® yoga instructors. All women in the study were asked to practice the techniques used during the prenatal yoga classes at home for a minimum of three times per week

for 60 minutes per session, and to record the date and duration of yoga practice sessions in the yoga journal provided by the investigator.

Healthy Moms® is a national perinatal health and wellness company that is "dedicated to promoting successful health and wellness programs to new expectant moms…before, during and after pregnancy" (Healthy Moms®, 2009). Healthy Moms ® was founded in 1989 by Sheila Watkins, a perinatal fitness specialist with five national certifications in pregnancy and postpartum fitness instructor training. Healthy Moms® yoga practitioners are nationally certified at the 200- and 500-hour level in yoga through Yoga Alliance®, an international yoga teacher certification organization (see Yoga Alliance® certification requirement charts in Appendix G) and are also certified in prenatal yoga training and teacher certification through the North Carolina School of Yoga (North Carolina School of Yoga, 2009). In addition, all Healthy Moms® prenatal yoga instructors are required to complete Healthy Moms® Perinatal Fitness Instructor training (see Appendix I for specific criteria for certification).

Healthy Moms® prenatal yoga does not conform to any particular style or philosophy of yoga practice, and yoga sessions do not incorporate religious philosophies or practices (Healthy Moms®, 2009). Women who participate in the Healthy Moms® prenatal yoga program practice focused breathing, gentle stretches, and relaxation during each 60-minute yoga session. Women enrolled in the program receive orientation materials and tips for comfort and safety prior to the first yoga session. Healthy Moms® prenatal yoga program requires a waiver of responsibility, a health history, and a signed form or letter from each woman's care provider giving permission for her to participate in the Healthy Moms® prenatal yoga program. The general format for each yoga class session is in Appendix H. Positions such as inversions and twists, and rapid and forceful breath practices or breath holding, all of which are contraindicated during pregnancy

(Brown, Gerbarg, & Muskin, 2009), are not practiced during the Healthy Moms® prenatal yoga sessions (Healthy Moms®, 2009).

The American College of Obstetricians and Gynecologists (ACOG) Committee Opinion on Exercise during Pregnancy and the Postpartum Period (American College of Obstetricians and Gynecologists, 2002) does not include specific recommendations regarding yoga practice or similar exercises that involve gentle stretching and non-aerobic physical activity. However, the ACOG Committee Opinion states that a thorough evaluation of all pregnant women should be conducted before recommending an exercise program, as was accomplished in this study. Participant risk in this study was minimized by: (a) requiring a written statement from each participant's health care provider certifying that there are no contraindications to participation in the yoga program; (b) designing yoga sessions specifically to accommodate the physical limitations and safety needs of women in late pregnancy; (c) having yoga sessions conducted by certified professional prenatal yoga instructors; and (d) individualizing each woman's yoga practice session as necessary to accommodate specific abilities and limitations.

Summary

This chapter described the methodology that was used to explore the changes in human-environmental field patterning in optimism, power, and well-being over time in women who participated in 6 weeks of prenatal yoga classes for 60 minutes per week, with additional yoga practice at home, during the second and third trimesters of pregnancy. The study methodology addressed the following research questions:

1. What are the changes in patterning, as observed through the manifestation of optimism, power, and well-being over time, in women before beginning and upon completing a 6-week prenatal yoga program during the second and third trimesters of pregnancy?

2. Does change in patterning, as observed through the manifestations of optimism, power, and well-being over time, differ for women beginning yoga classes in the third trimester from women who begin classes in the second trimester of pregnancy?

The variables of optimism, power, and well-being were measured using a one-group, correlational pre- and post-treatment survey design. A convenience sample of 21 multiethnic and sociodemographically diverse women in the second and third trimesters of pregnancy participated in the study. Optimism was measured by the LOT-R (Scheier et al., 1994), power was measure by the PKPCT v II (Barrett, 1986, 2003), and well-being was measured by the WPS (Gueldner et al., 2005). The SF-12v2 PCS and MCS (Ware et al., 1996) were used as an auxiliary measure of well-being. Data were collected before (Time 1) and upon completion of the 6-week prenatal yoga classes (Time 2) to measure changes in patterning over time of optimism, power, and well-being.

The methodology used in this study adds to the body of Rogerian science research that tests the congruency of correlational designs in identifying unique changes in human-environmental field patterning over time. The analysis of the findings is presented in Chapter 4.

CHAPTER 4

DATA ANALYSIS

Introduction

The purpose of this study was to explore changes in human-environmental field patterning of optimism, power, and well-being over time in women during the second and third trimesters of pregnancy upon completion of a 6-week prenatal yoga program. The research questions were:

1) What are the changes in patterning, as observed through the manifestation of optimism, power, and well-being over time, in women before beginning and upon completing a 6-week prenatal yoga program during the second and third trimesters of pregnancy?

2) Does change in patterning, as observed through the manifestations of optimism, power, and well-being over time, differ for women beginning yoga classes in the third trimester from women who begin classes in the second trimester of pregnancy?

Data Analysis

Data were evaluated for completeness. Frequency distributions were checked to identify extreme or inconsistent values. Descriptive statistics were used to describe the participants. The means, standard deviations, potential and obtained ranges, and Cronbach's alpha coefficients for Time 1 and Time 2 are presented in Table 2.

The majority of participants (n = 12) attended yoga classes for 6 weeks; 5 participants attended classes for 5 weeks; 3 attended classes for 4 weeks; and 1 attended classes for 3 weeks. To answer the first research question, changes in patterning, as observed through the manifestation of optimism (measured by the Life Orientation Test-Revised [LOT-R]); power,

Table 2

Means, Standard Deviations, Potential Ranges, Obtained Ranges, and Cronbach's alpha

TIME 1						
Measures	***n***	***M***	***SD***	**Potential Range**	**Obtained Range**	**Cronbach's α**
LOT-R	21	16.43	4.12	0-24	5-23	.88
PKPCT v II	21	248.43	33.87	48-336	193-248	.95
WPS	21	47.52	8.90	10-70	31-70	.87
PCS	20	46.57	6.25	**M 50; SD 10*	33-58	**
MCS	20	49.98	8.60	**M 50; SD 10*	34-61	**

* Norm-based scores for the general population

** Test-retest reliability is a more appropriate estimate of PCS and MCS scale reliability (Ware, Kosinski, Turner-Bowker, & Gandek, 2009, *User's Manual for the SF-v2 Health Survey*, p. 66).

TIME 2						
Measures	***n***	***M***	***SD***	**Potential Range**	**Obtained Range**	**Cronbach's α**
LOT-R	21	18.29	3.59	0-24	8-23	.87
PKPCT v II	21	270.09	37.60	48-336	218-332	.97
WPS	21	52.19	9.73	10-70	26-70	.90
PCS	20	43.46	8.51	**M 50; SD 10*	25-55	**
MCS	20	54.80	5.04	**M 50; SD 10*	44-61	***

* Norm-based scores for the general population

** PCS Test-retest reliability coefficient = .60

*** MCS Test-retest reliability coefficient = .685

(measured by the Power to Participate Knowingly in Change Tool Version II [PKPCT v II]); and well-being (measured by the Well-Being Picture Scale [WPS]) were examined over time. An analysis of the change in scores at baseline (Time 1) and following the 6-week prenatal yoga program (Time 2) was tested using a paired-samples, two-tailed t-test of significance to evaluate changes in scores for optimism, power, and well-being from Time 1 to Time 2. The t-test analysis is reported in Table 3. For the LOT-R, there was a statistically significant increase in scores from Time 1 to Time 2, $t(20) = 4.41$, $p = < .001$. The eta squared statistic (.49) indicated a large effect size. The scores from Time 1 to Time 2 were also significantly increased on the PKPCT v II, $t(20) = 3.15$, $p = .003$, eta squared = .33, which indicated a large effect size. The increase in WPS scores from Time 1 to Time 2 reached statistical significance, $t(20) = 2.57$, $p =$

.018, eta squared = .25, indicating a large effect. In addition, the increase in the mental component summary (MCS) scores from Time 1 to Time 2 was statistically significant, $t(19) = 3.41$, $p = .003$, eta squared = .38, which indicated a large effect. While Physical Component Summary (PCS) scores from Time 1 to Time 2 decreased, the decrease in scores did not reach statistical significance, although the effect size was large [$t(19) = 2.02$, $p = .058$, eta squared = .18].

Table 3

Paired Samples T-Test of the Change in Scores from Time 1 to Time 2

	Mean/*SD* (Time 1)	**Mean/*SD* (Time 2)**	***t***	***df***	**Sig.**	**Eta squared**
LOT-R	16.43/4.12	18.29/3.59	4.41	20	<.001	.49
PKPCT v II	248.43/33.87	270.09/37.60	3.15	20	.003	.33
WPS	47.52/8.90	52.19/9.73	2.57	20	.018	.25
PCS	46.57/6.25	43.46/8.51	2.02	19	.058	.18
MCS	49.98/8.60	54.80/5.04	3.41	19	.003	.38

Because of the small sample size, the non-parametric Mann-Whitney U Test was used to address the second research question: Does change in patterning, as observed through the manifestations of optimism, power, and well-being over time, differ for women beginning yoga classes in the third trimester from women who begin classes in the second trimester of pregnancy? The difference in mean gain scores for the LOT-R, PKPCT v II, and WPS among women in the second and third trimesters of pregnancy were explored. The analysis of gain scores, also known as change scores or difference scores, addresses group differences pre-test and post-test and is reported to be an unbiased estimate of true change over time (Rogosa, 1988).

Participants were divided into two groups according to which trimester they were in (second or third) when they entered the study. Women from 20 to 28 weeks gestation were considered to be in the second trimester of pregnancy, and women at 29 weeks and above were

considered to be in the third trimester. Gain scores were computed based upon the mean change in scores from Time 1 to Time 2 among the participants. The mean gain in scores and standard deviations for the LOT-R, PKPCT v II, and WPS for women entering the study during the second and third trimesters of pregnancy are reported in Table 4. The Mann-Whitney U Test did not reveal a statistically significant difference in gain scores for women in the second and third trimesters of pregnancy.

Table 4

Mann-Whitney U Test of Gain Scores According To the Trimester in Which Participants Entered into the Study

Second Trimester (*n* = *12)*	***M***	***SD***	***Z***	**Sig (2-tailed)**
LOT-R	1.58	1.97	-.468	.640
PKPCT v II	29.92	37.50	-1.813	.070
WPS	3.42	7.96	-.786	.432
Third Trimester (*n* = 9)	***M***	***SD***		
LOT-R	2.22	1.92		
PKPCT v II	10.67	17.66		
WPS	6.33	8.99		
All Participants (*n* = 21)	***M***	***SD***		
LOT-R	1.86	1.93		
PKPCT v II	21.67	31.52		
WPS	4.67	8.33		

Auxiliary Findings

The percentage of increase in gain scores for all participants is presented in Table 5. With the exception of PCS scores, gain scores for the majority of participants increased from Time 1 to Time 2. The WPS scores for eight participants (38.1%) did not increase from Time 1 to Time 2. Seven of the eight women with no gain in WPS scores also experienced a decline in PCS scores at Time 2.

Table 5

Percentages of Gains in Optimism, Power, Well-being, Physical Component Summary, and Mental Component Summary Scores

Instrument	**Percentage of Women with Gains in Scores**
LOT-R	76.2%
PKPCT Version II	80.9%
WPS	61.9%
PCS	28.6%
MCS	71.4%

As previously noted the majority of participants experienced a decrease in PCS scores from Time 1 to Time 2; however, the overall decrease in scores was not statistically significant. Table 6 compares the changes in scale scores for the participants with no gain in WPS scores.

Table 6

Comparison of Scale Scores for Participants with No Gain in WPS Scores

ID	**WPS**	**PKPCT v II**	**LOT-R**	**PCS**	**MCS**
2	0	20	2	-3.64	1.98
3	0	32	0	-2.95	3.36
5	0	-10	5	-.68	-1.70
7	-2	65	1	5.40	-.41
12	-1	3	1	-15.65	10.42
16	-5	12	4	-12.67	3.97
18	-7	15	1	-4.05	4.85
20	-7	-25	0	-3.49	2.06

Reliability of Instruments

A description of the study instruments (LOT-R, PKPCT v II, WPS, and SF-12v2) and discussion of the internal consistency of the measures as reported in the literature are provided in Chapter 3. The Cronbach's alpha coefficient for each of the study instruments as they performed in this study is presented in Table 2.

Life Orientation Test-Revised (LOT-R)

In this study the Cronbach's alpha coefficient for the LOT-R was .88 at Time 1 and .87 at Time 2, which suggests that the LOT-R has good internal consistency that is stable over time in pregnant women.

Power as Knowing Participation in Change Tool Version II (PKPCT v II)

The Cronbach's alpha coefficient for the PKPCT v II was .95 at Time 1 and .97 at Time 2, demonstrating good internal consistency that is stable over time and suggesting that the PKPCT v II is a reliable measure of power in pregnant women.

Well-Being Picture Scale (WPS)

The Cronbach's alpha coefficient for the WPS was .87 at Time 1 and .90 at Time 2, which indicates that the WPS is a reliable measure of well-being in pregnancy that is stable over time.

Short-Form 12 Version 2.0 (SF-12v2)

In this study the PCS and MCS were reported. Test-retest reliability was .60 at Time 1 and .685 at Time 2, indicating that in this study the SF-12v2 PCS and MCS did not demonstrate a high degree of internal consistency over time.

Summary

This chapter presented the analysis of the data that measured changes over time in optimism, power, and well-being before and after a 6-week prenatal yoga program. To answer the first research question, changes over time were measured using a paired-samples, two-tailed t-test of significance. The findings of the data analysis revealed that patterning changes manifested over time as increased optimism, power, and well-being. There was no difference in changes in patterning over time in optimism, power, and well-being for women beginning yoga classes in the second trimester as opposed to the third trimester of pregnancy. Auxiliary findings revealed that 38.1% of participants had no gains in WPS scores and most of the women with no gain in WPS scores also did not have a gain in PCS scores from Time 1 to Time 2. The discussion of the findings follows in Chapter 5.

CHAPTER 5

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Overview

The purpose of this study was to explore changes in human-environmental field patterning of optimism, power, and well-being over time in women during the second and third trimesters of pregnancy upon completion of a 6-week prenatal yoga program. A descriptive design was used to answer the following research questions: (1) what are the changes in patterning, as observed through the manifestation of optimism, power, and well-being over time, in women before beginning and upon completing a 6-week prenatal yoga program during the second and third trimesters of pregnancy, and (2) does change in patterning, as observed through the manifestations of optimism, power, and well-being over time, differ for women beginning yoga classes in the third trimester from women who begin classes in the second trimester of pregnancy? The discussion of the findings, conclusions, and recommendations is presented in this chapter.

Discussion

The purpose of this study was to explore changes in human-environmental field patterning of optimism, power, and well-being in women before and after completing a 6-week yoga program in late pregnancy in an effort to focus on pregnancy from a positive perspective in contrast to viewing pregnancy as a medical event focused on signs and symptoms of pathology. The selection of optimism, power, and well-being was guided by Rogers' Science of Unitary Human Beings (SUHB), which presents an optimistic worldview of health and well-being in which individuals have the capacity to participate in change toward maximization of health potentials (Gueldner, et al., 2005). Well-being is patterning of functional and positive changes

within living systems and conveys a holistic conceptualization of human-environmental interrelationships.

The view of optimism and power as salient dimensions of well-being was supported in the findings of this study. Patterning changes in mean scale scores for optimism, power, and well-being in this study reflected a statistically significant increase from baseline to completion of the 6-week prenatal yoga program. While the majority of women had positive gains in WPS scores from Time 1 to Time 2, slightly more than one-third of the participants did not have an increase in WPS scores at Time 2. For most study participants PCS scores decreased from Time 1 to Time 2. These findings suggest that the physical challenges of late pregnancy may have contributed to a diminished sense of well-being in those participants who did not achieve gains in WPS scores from Time 1 to Time 2.

Another focus of the study was to explore whether changes in human-environmental field patterning, as observed through the manifestations of optimism, power, and well-being over time, differed for women who began yoga classes in the third trimester from women who began classes in the second trimester of pregnancy. An analysis of gain scores, as a predictor of change over time in optimism, power, and well-being, revealed no significant differences for women who entered the study in the second trimester of pregnancy from those who entered in the third trimester.

Several challenges were experienced in recruiting women into the study. While a number of women receiving prenatal care at the public health clinic called the investigator to express interest in the study, few women followed through with completing the required documentation and attending the yoga classes. Once the opportunity to participate in the study was offered to women receiving prenatal care at a private midwifery practice, enrollment into the study

increased; however, Healthy Moms® was unable to accommodate all women who were interested in the study once classes became full. Several women missed one day of class due to family vacations. Others were unable to attend the full 6 weeks due to work schedules. Although some women were unable to participate for the full 6 weeks, there was no significant difference in optimism, power, or well-being among the women in the study upon analysis of the group as a whole, regardless of the average number of hours they spent per week practicing yoga from start to finish of the prenatal yoga program. This finding suggests that: (a) there may not have been a relationship between yoga practice and increased optimism, power, or well-being found in the analysis of data in this study, or that (b) yoga practice in general, regardless of the length and duration of practice sessions may have been beneficial in increasing optimism, power, and well-being for the women in this study. Future studies incorporating a randomized design could best determine whether or not there is a relationship between yoga practice and the study variables.

Participants were asked to keep a journal to capture day-to-day and week-to-week observations about their experiences of practicing yoga in class and at home. In addition, each participant was asked about their overall experience of the yoga classes in a telephone interview. The comments were brief and predominantly positive, revealing interesting and different practices used by the women that may be useful in future research. While most women prior to participating in the study perceived yoga as very beneficial (47.6%, $n = 10$) or beneficial (38.1%, $n = 8$), several stated that the experience of prenatal yoga classes and practicing yoga at home exceeded their expectations. Most women found yoga classes physically challenging; however, none of the participants reported that they sustained injuries due to yoga practice. A synopsis of the participants' yoga journal comments is presented in Table 7.

Table 7

Study Participants' Yoga Journal Entries

"Yoga gave me confidence and motivation to continue the yoga regime throughout the rest of my pregnancy."
"Exceeded my expectations."
"I believe it will help with labor."
"Helps more mentally and emotionally than physical."
"…was physically challenging at first."
"I felt good physically, but emotionally I was down because it was the last class."
"Keeps me going."
"The class motivates me week by week."
"Makes me happy."
"It made me feel good about myself."
"I find strength even when I'm exhausted."
"Good mood."
"Good replacement for running."
"I use yoga to relax and have 'me' time."
"Connected to self and baby."
"Really impressed with the progress I'm seeing."
"I have started to notice that doing yoga is a necessity to make it through the day."
"Felt relaxed and ready to sleep."
"I use scripture to become centered and focused on the breathing and poses."
"Yoga saved me!"

The instruments used to measure optimism, power, and well-being have strong evidence of validity and were found to be highly reliable and stable over time in this study. Still more research is needed to test the logical congruence of the concepts and variables tested in this study as they exist within the SUHB conceptual framework (Fawcett, 2005).

From a methodological standpoint, this study has both strengths and limitations. To the investigator's knowledge, this study is the first to explore patterning of optimism, power, and well-being within the SUHB before and after a prenatal yoga program in late pregnancy.

The findings of the study support the reliability of the LOT-R, PKPCT v II, and WPS in late pregnancy. However, in this study the SF-12 v2 PCS and MCS were found to be less reliable measures of well-being over time. Additional strengths of the study were that participants were ethnically and sociodemographically diverse and all women in the study reported that yoga was a beneficial practice for them. Limitations of the study include small sample size, purposeful sampling, reliance on self-report measures, and lack of random assignment, which limits the generalizability of the findings.

Conclusions

Patterning is a process of facilitating unitary well-being (Barrett, 2000). The findings of this study support that field pattern diversity and unitary well-being among women who practiced yoga during late pregnancy manifested over time as greater optimism, power, and well-being and supports Rogers' (1992) claim that field pattern diversity is relative for any given individual as well as between individuals. Support for yoga practice as an empowering and transformational experience is reflected in the comments of the women as reported verbally and in their yoga journals. Nurses practicing within the SUHB framework are concerned with the health and well-being of people as they live in their worlds within a pandimensional universe (Rogers, 1992). Nurses and all health professionals can prescribe yoga as a unitary health and wellness modality that is consistent with the SUHB view of human beings.

Recommendations

Recommendations for future inquiry based upon the findings of this study are as follows.

1. A larger number of participants and the use of randomized assignment could be useful in future studies to determine if changes in optimism, power, and well-being can be explicitly contributed to yoga practice during pregnancy.
2. A larger sample is needed to test the correlations between the Rogerian-science derived instruments and those derived external to the SUHB used in this study.
3. Women in this study documented their experience of practicing yoga as overwhelmingly positive in their yoga journals. This suggests that an important contribution to the body of knowledge about the experience of yoga practice during pregnancy would be to explore the lived experience of yoga practice through women's own stories of their yoga practice and the patterning of changes in their lives that they attribute to yoga practice.
4. Exploring the patterning of optimism, power, and well-being should include women throughout pregnancy and through the first few weeks postpartum.
5. Transportation and childcare often serve as barriers in recruiting low-income individuals as research study participants (Yancey, Ortega, & Kumanyika, 2006). Providing transportation and childcare to socioeconomically disadvantaged women could reduce recruitment barriers and increase participation in this group of women.
6. There is growing interest in yoga practice during pregnancy to promote emotional well-being (Battle, Uebelacker, Howard, & Castaneda, 2010; Rakhshani, Maharana, Raghuram, Nagendra, & Venktram, 2010); therefore, the relationship of yoga practice to the patterning of optimism, power, and well-being among women at high-risk for perinatal depression should be explored.

7. Providing participants with a prenatal yoga video that they can use at home would most likely enhance the consistency of their home yoga practice routine.
8. Future studies should include postnatal outcome measures such as duration of labor, maternal and fetal tolerance of labor, maternal mood state postpartum, sleep patterns, and adaptation to the parenting role in women who practiced yoga during pregnancy and in those who did not practice yoga.

References

Adams, J., Lui, C.W, Sibbritt, D., Broom, A., Wardle, J., Homer, C., & Beck, S. (2009). Women's use of complementary and alternative medicine during pregnancy: A critical review of the literature. *Birth, 36*(3), 237-245.

Alligood, M.R., & Fawcett, J. (2004). An interpretive study of Martha Rogers' conception of pattern. *Visions: The Journal of Rogerian Nursing Science, 12*(1), 8-13.

Amador, N., Juarez, J.M., Guízar, J.M., & Linares, M. (2008). Quality of life in obese pregnant women: A longitudinal study. *American Journal of Obstetrics and Gynecology*, *198*, 203.e1-203.e5.

American College of Nurse-Midwives (2004). Philosophy of the American College of Nurse-midwives. Retrieved June 5, 2009, from http://www.midwife.org.

American College of Obstetricians and Gynecologists (2002). ACOG Committee Opinion Number 267. Exercise during pregnancy and the postpartum period. *Obstetrics and Gynecology, 99,* 171-173.

Atkinson, N.L., & Permuth-Levine, R. (2009). Benefits, barriers and cues to action of yoga practice: A focus group approach. *American Journal of Health Behavior*, *33*(1), 3-14.

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press.

Barnett, M.C., Cotroneo, M., Purnell, J., Martin, D., Mackenzie, E., & Fishman, A. (2003). Use of CAM in local African-American communities: Community-partnered research. *Journal of the National Medical Association, 95*(10), 943-950.

Barrett, E. A. M. (1983). An empirical investigation of Martha E. Rogers's principle of helicy: The relationship of human field motion and power (Doctoral dissertation, New York University, 1983). *Dissertation Abstracts International, 45*, 615A.

Barrett, E.A.M. (1986). Investigation of the principle of helicy: The relationship of human field motion and power. In V.M. Malinski (Ed.), *Explorations on Martha Rogers' science of unitary human beings* (pp.173-184). Norwalk, CT: Appleton-Century-Crofts.

Barrett, E.A.M. (1996). *The relation of human field motion and power: A replication and extension.* Unpublished manuscript.

Barrett, E.A.M. (1998). A Rogerian practice methodology for health patterning. *Nursing Science Quarterly, 11*(4), 136-138.

Barrett, E.A.M. (2000). The theoretical matrix for a Rogerian nursing practice. *Theoria: Journal of Nursing Theory*, *9*(4), 3-7.

Barrett, E.A.M. (2003). A measure of power as knowing participation in change. In O.L. Strickland and C. Dilorio (Eds.), *Measurement of nursing outcomes. Volume 3: Self care and coping* (2nd ed.) (pp. 21-39).New York, NY: Springer Publishing Company.

Barrett, E.A.M. (2010). Power as Knowing Participation in Change: What's new and what's next? *Nursing Science Quarterly*, *23*(1), 47-54.

Barrett, E.A.M., & Caroselli, C. (1998). Methodological ponderings related to the power as knowing participation in change tool. *Nursing Science Quarterly*, *11*(1), 17-22.

Battle, C.L., Uebelacker, L.A., Howard, M., & Castaneda, M. (2010). Prenatal yoga and depression during pregnancy. *Birth*, *37*(4), 353-354.

Beddoe, A.E., Lee, A., Weiss, S.J., Kennedy, H.P., & Yang, C.P.P. (2010). Effects of mindful yoga on sleep in pregnant women: A pilot study. *Biological Research for Nursing, 11*(4), 363-370.

Beddoe, A.E., Yang, P.P.P., Kennedy, H.P., Weiss, S.J., & Lee, K.A. (2009). The effects of mindfulness-based yoga during pregnancy on maternal psychological and physical distress. *JOGNN, 38*(3), 310-319.

Beck, A.T. (1967). *Depression: Clinical, experimental, and theoretical aspects.* New York: Harper & Row.

Birdee, G.S., Legedza, A.T., Saper, R.B., Bertisch, S.M., Eisenberg, D.M., & Phillips, R.S. (2008). Characteristics of yoga users: Results of a national survey. *Journal of General Internal Medicine, 23*(10), 1653-1658.

Bramlett, M.H. (1990). *Power, creativity and reminiscence in the elderly.* Unpublished doctoral dissertation, Medical College of Georgia, Augusta.

Brissette, I., Scheier, M.F., & Carver, C.S. 2002). The role of optimism in social network development, coping, and psychological adjustment during a life transition. *Journal of Personality and Social Psychology, 82*(1), 102-111.

Brown, C.M., Barner, J.C., Richards, K.M., & Bohman, T.M. (2007). Patterns of complementary and alternative medicine use in African Americans. *The Journal of Alternative and Complementary Medicine, 13*(7), 751-758.

Brown, R.P., Gerbarg, P.L., & Muskin, P.R. (2009). *How to use herbs, nutrients, and yoga in mental health care.* New York, N.Y.: W.W. Norton.

Caroselli, C., & Barrett, E.A.M. (1998). A review of the power as knowing participation in change literature. *Nursing Science Quarterly, 11*(1), 9-16.

Carver, C.S., & Gaines, J.G. (1987). Optimism, pessimism, and postpartum depression. *Cognitive Therapy and Research, 11*(4), 449-462.

Carver, C.S., & Scheier, M. (2003). Optimism. In S.J. Lopez and C.R. Snyder (Eds.), *Positive psychological assessment. A handbook of models and measures* (pp. 75-89). Washington, DC: American Psychological Association.

Cella, D.F., Tulsky, D.S., Gray, G., Sarafian, B., Linn, E., Bonomi, A., …& Brannon, J. (1993). The Functional Assessment of Cancer Therapy scale: development and validation of the general measure. *Journal of Clinical Oncology, 11*(3)570-579.

Chang, J.J., Pien, G.W., Duntley, S.P., & Macones, G.A. (2009). Sleep deprivation during pregnancy and maternal and fetal outcomes: is there a relationship? *Sleep Medicine Reviews, 14*(2), 107-114.

Chuntharapat, S., Petpichetchian, W., & Hatthakit, U. (2008). Yoga during pregnancy: Effects on maternal comfort, labor pain, and birth outcomes. *Complementary Therapies in Clinical Practice, 14,* 105-115.

Cohen, J. (1988). *Statistical and power analysis for the behavioral sciences.* Hillsdale, N.J.: Erlbaum.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24,* 385-396.

Collins, C. (1998). Yoga: Intuition, preventive medicine, and treatment. *JOGNN, 27*(5), 563-568.

Columbo, S. A. (1986). General well-being in adolescents: Its nature and measurement (Doctoral dissertation, Saint Louis University, 1984). *Dissertation Abstracts International*, *46*, 2246B.

Cowling, W.R. III (1986). The science of unitary human beings: Theoretical issues, methodological challenges, and research realities. In V.M. Malinski (Ed.), *Explorations on Martha Rogers' science of unitary human beings* (pp. 65-77). Norwalk, CT: Appleton-Century-Crofts.

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

Daut, R. L., Cleeland, C. S., & Flanery, R. C. (1983). Development of the Wisconsin Brief Pain Questionnaire to assess pain in cancer and other diseases. *Pain, 17,* 197-210.

Davies, A. R., & Ware, J. E. (1981). *Measuring health perceptions in the health insurance experiment*. Santa Monica, CA: The Rand Corporation.

Diener, E. (1985). Subjective well-being. *Psychological Bulletin, 95*(3), 542-575.

Epstein G.N., Halper J.P., Barrett E.A.M., Birdsall C., McGee M., Baron K.P; & Lowenstein S. (2004). A pilot study of mind-body changes in adults with asthma who practice mental imagery. *Alternative Therapies in Health & Medicine, 10,* (4), 66-71.

Factor-Litvak, P., Cushman, L.F., Kronenberg, F., Wade, C., & Kalmuss, D. (2001). Use of complementary and alternative medicine among women in New York City: A pilot study. *Journal of Alternative and Complementary Medicine, 7*(6), 659-666.

Fawcett, J. (1996). Issues of (in)compatibility between the worldview and research rules of the science of unitary human beings: An invitation to dialogue. *Visions: The Journal of Rogerian Nursing Science, 4*(1), 5-11.

Fawcett, J. (2005). *Contemporary nursing knowledge. Analysis and evaluation of nursing models and theories* (2nd ed.). Philadelphia: F.A. Davis.

Ference, H.M. (1980). The relationship of time experience, creativity traits,

differentiation and human field motion. An empirical investigation of Rogers' correlates of synergistic human development. *Dissertation Abstracts International,* 40, 5206B.

Ference, H.M. (1986). The relationship of time experience, creativity traits, differentiation and human field motion. In V.M. Malinski (Ed.), *Explorations on Martha Rogers' science of unitary human beings* (pp. 95-106). Norwalk, CT: Appleton-Century-Crofts.

Fugh-Berman, A., & Kronenberg, F. (2003). Complementary and alternative medicine (CAM) in reproductive-age women: A review of randomized controlled trials. *Reproductive Technology, 17,* 137-152.

Grote, N.K., & Bledsoe, S.E. (2007). Predicting postpartum depressive symptoms in new mothers: The role of optimism and stress frequency during pregnancy. *Health and Social Work, 32*(2), 107-118.

Grote, N.K., Bledsoe, S.E., Wellman. J., & Brown, C. (2007). Depression in African American and white women with low incomes: The role of chronic stress. *Social Work in Public Health, 23*(2-3), 59-88.

Gueldner, S.H. (1986). The relationship between imposed motion and human field motion in elderly individuals living in nursing homes. In V.M. Malinski (Ed.), *Explorations on Martha Rogers' science of unitary human beings* (pp.161-171). Norwalk, CT: Appleton-Century-Crofts.

Gueldner, S.H. (2007). Theory of well-being derived from Martha E. Rogers' Theory of Unitary Human Beings. Abstract of paper presented at the 18th International Nursing Research Congress Focusing on Evidence-based Practice. Vienna, Austria, July 11-14, 2007.

Retrieved 5/27/07, from: http://stti.confex.com/stti/congrs07/techprogram/paper_34746.htm.

Gueldner, S.H., Michel, Y., Bramlett, M.H., Liu, C.F., Johnston, L.W., Endo, E., Minegishi, H., & Carlyle, M.S. (2005). The Well-Being Picture Scale. A revision of the index of field energy. *Nursing Science Quarterly, 18* (1), 42-50.

Gunther, M. (2006). Rogers' science of unitary human beings in nursing practice. In M.R. Alligood & A.M. Tomey (Eds.), *Nursing theory. Utilization & Application* (pp.283-305). St. Louis: Mosby.

Healthy Moms® Perinatal Fitness (2009). Retrieved August 16, 2009, from http://www.healthymomsfitness.com.

Hirsch, J.K., Britton, P.C., & Conner, R. (2009). Psychometric evaluation of the Life Orientation Test—Revised in treated opiate dependent individuals. *International Journal of Mental Health and Addiction,* DOI 10.1007/s11469-009-9224-2.

Hsiao, A.F., Wong, M.D., Goldstein, M.S., Yu, H.J., Anderson, R.M., Brown, E.R., Beccera, L.M., & Wenger, N.S. (2006). Variation in complementary alternative medicine (CAM) use across racial/ethnic groups and the development of ethnic-specific measures of CAM use. *Journal of Alternative and Complementary Medicine, 12*(3), 281-290.

Hwu, Y.J., Coates, V.E., & Boore, J.R.P. (2001). The evolving concept of health in nursing research: 1988-1998. *Patient Education and Counseling 42*, 105-114.

Iyengar, B.K.S. (1979). *Light on yoga.* New York: Schocken.

Iyengar, B.K.S. (2001). *Yoga. The path to holistic health.* New York: Dorling Kindersley.

Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness.* New York: Dell Publishing

Killingsworth Rini, C., Dunkel-Shetter, C., Wadhwa, P.D., & Sandman, P.A. (1999). Psychological adaptation and birth outcomes: the role of personal resources, stress, and sociocultural context in pregnancy. *Health Psychology, 18*(4), 333-345.

Kim, T.S., Kim, C., Park, K.M., Park, Y.S., & Lee, B.S. (2008). The relation of power and well-being in Korean adults. *Nursing Science Quarterly, 21*(3), 247-254.

Kolcaba, K. (2003). Comfort theory and practice: A vision for holistic health care and research. New York: Springer.

Kronenberg, F., Cushman, L.F., Wade, C.M., Kalmuss, D. & Chao, M.T. (2006). Race/ethnicity and women's use of complementary and alternative medicine in the United States: Results of a national survey. *American Journal of Public Health, 96*(7), 1236-1242.

Lacasse, A., & Bérard, A. (2008). Validation of the nausea and vomiting of pregnancy specific health related quality of life questionnaire. *Health and Quality of Life Outcomes, 6*:32 doi:10.1186/1477-7525-6-32.

Lacasse ,A., Rey, E., Ferreira, E., Morin, C., & Bérard A. (2008). Nausea and vomiting of pregnancy: what about quality of life? *BJOG, 115,* 1484–1493.

Laffrey, S. C. (1986). Development of a health conception scale. *Research in Nursing and Health, 9,* 107-113.

Lee, K. A. (1992). Self-reported sleep disturbances in employed women. *Sleep, 15,* 493-498.

Lobel, M., DeVincent, C.J., Kaminer, A., & Meyer, B.A. (2000). The impact of prenatal maternal stress and optimistic disposition on birth outcomes in medically high-risk women. *Health Psychology, 19*(6), 544-553.

Lobel, M., Yali, A.M., Zhu, W., DeVincent, C.J. & Meyer, B.A. (2002). Beneficial associations between optimistic disposition and emotional distress in high-risk pregnancy. *Psychology and Health, 17*(1), 77-95.

Malinski, V.M. (1986). Nursing practice within the science of unitary human beings. In V.M. Malikski (Ed.), *Explorations on Martha Rogers' science of unitary human beings.* Norwalk, CT: Appleton-Century-Crofts.

Malinski, V.M. (2006). Rogerian science-based nursing theories. *Nursing Science Quarterly, 19*(1), 7-12.

McNiff, M.A. (1995). *A study of the relationship of power, perceived health, and life satisfaction in adults with long-term care needs based on Martha E. Rogers science of unitary human beings.* Unpublished doctoral dissertation, New York University, New York.

Moadel, A.B., Shah, C., Wylie-Rosett, J., Harris, M.S., Patel, S.R., Hall, C.B. & Sparano, J.A. (2007). Randomized controlled trial of yoga among a multiethnic sample of breast cancer patients: Effects on quality of life. *Journal of Clinical Oncology, 25*(28), 4387-4395.

Moyer, C.A., Yang, H., Kwawukume, Y., Gupta, A., Zhu, Y.C., Koranteng, I….& Anderson, F. (2009). Optimism/pessimism and health-related quality of life during pregnancy across three continents: a matched cohort study in China, Ghana, and the United States. *BMC Pregnancy and Childbirth, 9,* doi: 10.1186/1471-2393-9-39.

Narendran, S., Nagarathna, R., Gunasheela, S. & Nagendra, H.R. (2005). Efficacy of yoga in pregnant women with abnormal Doppler study of umbilical and uterine arteries. *Journal of the Indian Medical Association, 103*(1), 12-17.

Narendran, S., Nagarathna, R., Narendran, V., Gunasheela, S., & Nagendra, H. (2005). Efficacy of yoga on pregnancy outcome. *The Journal of Alternative and Complementary Medicine, 11*(2), 237-244.

Nelson, D.B., McMahon, K., Joffe, M., & Brensinger, C. (2003). The effect of depressive symptoms and optimism on the risk of spontaneous abortion among innercity women. *Journal of Women's Health, 12*(6), 569-576.

North Carolina School of Yoga (2009). Prenatal Yoga Teacher Training and Certification. Retrieved September 17, 2009, from http://www.ncschoolofyoga.com/

Park, C.L., Moore, P.J., Turner, R.A., & Adler, N.E. (1997). The roles of constructive thinking and optimism and behavioral adjustment during pregnancy. *Journal of Personality and Social Psychology, 73*(3), 584-592.

Parry, B.L., Martínez, L.F., Maurer, E.L., López, A.M., Sorenson, D., & Meliska, C.J. (2006). Sleep, rhythms and women's mood. Part I: Menstrual cycle, pregnancy, and postpartum. *Sleep Medicine Reviews, 10*(2), 129-144.

Peterman, A.H., Fitchett, G., Brady, M.J., Hernandez, L., & Cella, D. (2002). Measuring spiritual well-being in people with cancer: the functional assessment of chronic illness therapy-Spiritual Well-being Scale (FACIT-Sp).*Annals of Behavioral Medicine, 24*(1), 49-58.

Poulios, D. (1997). A celebration of unitary human beings: Becoming a mother. In M. Madrid (Ed.), *Patterns of Rogerian knowing* (pp. 230-235). New York: National League for Nursing.

Rakhshani, A.,Maharana, S., Raghuram, N., Nagendra, H.R., & Venktram, P. (2010). Effects of integrated yoga on quality of life and interpersonal relationship of pregnant women. *Quality of Life Research, 19*(10), 1447-1455.

Rasmussen, H.N., & Scheier, M.F, (2009). Optimism and physical health: A meta-analytic review. *Annals of Behavioral Medicine,* DOI 10.1007/s12160-009-9111- x.

Reis, P.J., & Alligood, M.R. (2008). Well-being in pregnancy. A pilot study using the Well-Being Picture Scale. *Visions: The Journal of Rogerian Nursing Science, 15*(1), 8-17.

Reivich, K., & Gillham, J. (2003). Learned optimism: The measurement of explanatory style. In S.J. Lopez & C.R. Snyder (Eds.), *Positive psychological assessment* (pp.57-74). Washington, DC: American Psychological Association.

Rizzo, J. (1990). *An investigation of the relationships of life satisfaction, purpose in life, and power in individuals sixty-five years and older.* Unpublished doctoral dissertation, New York University, New York.

Rogers, M.E. (1970). *An introduction to the theoretical basis of nursing.* Philadelphia: F.A. Davis.

Rogers, M.E. (1986). Science of unitary human beings. In V.M> Malinski (Ed.), *Explorations on Martha Rogers' science of unitary human beings* (pp. 3-8). Norwalk, CT: Appleton-Century-Crofts.

Rogers, M.E. (1992). Nursing science and the space age. *Nursing Science Quarterly, 5*(1), 27-34.

Rogers, M.E. (1994). The science of unitary human beings: Current perspectives. *Nursing Science Quarterly, 7*(1), 33-35.

Rogosa, D. (1988). Myths about longitudinal research. In K. W. Schaie, R. T. Campbell, W. M. Meredith, & S. C. Rawlings (Eds.), *Methodological issues in aging research* (pp. 171-209). New York, NY: Springer.

Rooks, J.P. (1997). *Midwifery and childbirth in America.* Philadelphia: Temple University.

Roquemore, B. (2001). The yoga craze. *Ebony, 56*(10), p. 122, 124, & 126.

Ryan, R., & Deci, E. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology, 52,* 141-166.

Saper, R.B., Eisenberg, D.M., Davis, R.B., Culpepper, L. & Phillips, R.S. (2004). Prevalence and patterns of adult yoga use in the United States: Results of a national survey. *Alternative Therapies in Health and Medicine, 10*(2), 44-49.

Satyapriya, M. Nagendra, H.R., Nagarathna, R., & Padmalatha, V. (2009). Effect of integrated yoga on stress and heart rate variability in pregnant women. *International Journal of Gynecology and Obstetrics, 104,* 218-222.

Scheier, M.F., & Carver, C.S. (1985). Optimism, coping, and health: assessment and implications of generalized outcome expectancies. *Health Psychology, 4*(3), 219-247.

Scheier, M.F., & Carver, C.S. (1987). Dispositional optimism and physical well-being: the influence of generalized outcome expectancies on health. *Journal of Personality,55*(2), 169-210.

Scheier, M.F., Carver, C.S., & Bridges, M.W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology, 67*(6), 1063-1078.

Seligman, M.E. (2006). *Learned optimism. How to change your mind and your life.* New York: Vintage Books.

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. (1989). *Manual for the state-trait anxiety inventory (form Y).* Tampa, FL: University of South Florida.

Stoekle, M.L. (1993). *Waiting for a second chance at life: An examination of health-related hardiness, uncertainty, power, and the environment in adults on the kidney transplant waiting list.* Unpublished doctoral dissertation, University of Cincinnati.

Sun, Y.C., Hung, Y.C., Chang, Y., & Kuo, S.C. (2009). Effects of a prenatal yoga programme on the discomforts of pregnancy and maternal childbirth self-efficacy in Taiwan. *Midwifery,* doi:10.1016/j.midw.2009.01.005.

Wang, S.M., DeZinno, P., Fermo, L., William, K., Caldwell-Andrews, A.A., Bravemen, F. & Kain, Z.N. (2005). Complementary and alternative medicine for low-back pain in pregnancy: a cross-sectional survey. *Journal of Alternative and Complementary Medicine, 11*(3), 459-464.

Ware, J.E., Kosinski, M., & Keller, S. (1996). A 12-item Short-Form Health Survey: Construction of scales and preliminary tests of reliability and validity. *Medical Care, 34*(3), 220-223.

Ware, J.E., Kosinski, M., Turner-Bowker, D.M., & Gandek, B. (2009). Users' manual for the SF-12v2® health survey. Lincoln, R.I.: QualityMetric Incorporated.

Ware J.E., & Sherbourne C.D. (1992). The MOS 36-Item Short-Form Health Survey (SF-36®): I. Conceptual framework and item selection. *Medical Care 30*(6):473-83.

Wertz, R.W., & Wertz, D.C. (1989). *Lying-in. A history of childbirth in America* (Expanded edition). New Haven, CT: Yale University Press.

Yancey, A.K., Ortega, A.N., & Kumanyika, S.K. 2006). Effective recruitment and retention of minority research participants. *Annual Review of Public Health, 27*, 1-28.

Yarcheski, A., & Mahon, N. E. (1991). An empirical test of Rogers' original and revised theory of correlates in adolescents. *Research in Nursing & Health, 14*, 447-455.

Yarcheski, A., Mahon, N., & Yarcheski, T. (2001). Social support and well-being in early adolescents. *Clinical Nursing Research, 10*(2), 163-181.

Yarcheski, A., Mahon, N., & Yarcheski, T. (2004). Health and well-being in early adolescents using Rogers' Science of Unitary Human Beings. *Nursing Science Quarterly, 17*(1), 72-77.

Appendix A

University Medical Center Institutional Review Board Letters of Approval

Consent Form

University and Medical Center Institutional Review Board
East Carolina University • Brody School of Medicine
600 Moye Boulevard • Old Health Sciences Library, Room 1L-09 • Greenville, NC 27834
Office **252-744-2914** • Fax **252-744-2284** • **www.ecu.edu/irb**
Chair and Director of Biomedical IRB: L. Wiley Nifong, MD
Chair and Director of Behavioral and Social Science IRB: Susan L. McCammon, PhD

TO: Pamela Reis, MSN, 2212 Hollowgate Road, Raleigh, NC 27614

FROM: UMCIRB

DATE: November 25, 2009

RE: Expedited Category Research Study

TITLE: "Prenatal Yoga Practice and Patterning Change In Optimism, Power, and Well Being"

UMCIRB #09-0848

This research study has undergone review and approval using expedited review on 11/24/09. This research study is eligible for review under an expedited category because it is a collection of data through noninvasive procedures (not involving general anesthesia or sedation) routinely employed in clinical practice, excluding procedures involving x-rays or microwaves. Where medical devices are employed, they must be cleared/approved for marketing. (Studies intended to evaluate the safety and effectiveness of the medical device are not generally eligible for expedited review, including studies of cleared medical devices for new indications.) Examples: (a) physical sensors that are applied either to the surface of the body or at a distance and do not involve input of significant amounts of energy into the subject or an invasion of the subject's privacy; (b) weighing or testing sensory acuity; (c) magnetic resonance imaging; (d) electrocardiography, electroencephalography, thermography, detection of naturally occurring radioactivity, electroretinography, ultrasound, diagnostic infrared imaging, doppler blood flow, and echocardiography; (e) moderate exercise, muscular strength testing, body composition assessment, and flexibility testing where appropriate given the age, weight, and health of the individual.
Also, it is a collection of data from voice, video, digital, or image recordings made for research purposes.
Furthermore, it is research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. (NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b)(3). This listing refers only to research that is not exempt.)
The Chairperson (or designee) deemed this **Martha E. Rogers Scholars Fund of the Society of Rogerian Scholars** sponsored study **no more than minimal risk** requiring a continuing review in **12 months**. Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The investigator must adhere to all reporting requirements for this study.

The above referenced research study has been given approval for the period of **11/24/09** to **11/23/10**. The approval includes the following items:

- Internal Processing Form (dated 10/30/09)
- Dissertation Protocol
- Informed Consent (dated 11/16/09)
- Provider Consent Form for Prenatal Yoga Participation
- Conflict of Interest Disclosure Form (dated 11/16/09)
- Flyer
- Letter of Support from Wake County Human Services (dated 11/11/09)
- Demographic Questionnaire
- LOT-R (Life Orientation Test-Revised)
- Power to Knowingly Participate in Change Tool (version 2)
- Well-Being Picture Scale
- Yoga Alliance 200-Hour Instructor Standards
- Yoga Alliance 500-Hour Instructor Standards
- Healthy Moms Refund Policy
- Healthy Moms Exercise Waiver
- Healthy Moms Pre/Postnatal Health History and General Information Sheet
- Healthy Moms Health and Exercise History
- Healthy Moms Tips for Your Comfort and Safety
- Healthy Moms Perinatal Fitness Instructor Training and Certification

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

The UMCIRB applies 45 CFR 46, Subparts A-D, to all research reviewed by the UMCIRB regardless of the funding source. 21 CFR 50 and 21 CFR 56 are applied to all research studies under the Food and Drug Administration regulation. The UMCIRB follows applicable International Conference on Harmonisation Good Clinical Practice guidelines.

East Carolina University

1907-2007 CENTENNIAL

Consent to Participate in Research that is Greater than Minimal Risk

Information to Consider Before Taking Part in This Research

Title of Research Study: PRENATAL YOGA PRACTICE AND PATTERNING CHANGE IN OPTIMISM, POWER, AND WELL-BEING

Principal Investigator: Pamela J. Reis, CNM, MSN, PhD(c)
Institution/Department or Division: East Carolina University College of Nursing
Address: 3158 Health Sciences Building, Greenville, N.C. 27858
Telephone #: 919-866-1262 (home)

Researchers at East Carolina University (ECU) study diseases, health problems, environmental problems, behavior problems and the human condition. Our goal is to try to find better ways to improve the lives of you and others. To do this, I need the help of people who are willing to take part in research.

The person who is in charge of this research is called the Principal Investigator. The Principal Investigator may have other research staff members who will perform some of the procedures such as handing out the questionnaires.

The person explaining the research to you is the Principle Investigator.

You may have questions that this form does not answer. If you do have questions, feel free to ask the Principle Investigator as you go along. You may have questions later and you should ask those questions, as you think of them. There is no time limit for asking about this research.

You do not have to take part in this research. Take your time and think about the information that is provided. If you want, have a friend or family member go over this form with you before you decide. It is up to you. If you choose to be in the study, then you should sign the form when you are comfortable that you understand the information provided below. If you do not want to take part in the study, you should not sign this form. That decision is yours and it is okay to decide not to volunteer.

This form explains why this research is being done, what will happen during the research, and what you will need to do if you decide to volunteer to take part in this research.

Why is this research being done?

The purpose of this research study is to study the effects of prenatal yoga practice on optimism, power to participate knowingly in change and general well-being. Although yoga is practiced by many pregnant women there are very few studies that have reported the physical and psychological outcomes of yoga practice during pregnancy. I am asking you to take part in this research. However, the decision is yours to make. By doing this research, I hope to learn how practicing yoga can benefit women during pregnancy.

Why am I being invited to take part in this research?

You are being invited to take part in this research because you are age 18 and older, can read and speak English, are in the second or third trimester of pregnancy, have no pregnancy complications or medical conditions, have not taken yoga classes previously, and have an individual or family income of $45,000 per year or less. If you volunteer to take part in this study, you will be one of about 35 people to do so in the Triangle area.

Are there reasons I should not take part in this research?
I understand that I should not volunteer for this study if I am less than 18 years of age, have pregnancy or medical complications, cannot read or write English, have practiced yoga before, or have an income of more than $45,000 per year.

What other choices do I have if I do not take part in this research?
You have the choice of not taking part in this research study.

Where is the research going to take place and how long will it last?
The research procedures will be conducted at one of three Healthy Moms® prenatal yoga studios in one of 2 locations in Raleigh, NC or one in Cary, NC. You will need to come to one of the three studios located at 10930 Raven Ridge Road, Raleigh, NC or 215 Bickett Blvd, Raleigh, NC or 163 Pebblecreek, Cary, NC for 6 times or once per week during the study. Each of those visits will take about 1 hour. The total amount of time you will be asked to volunteer for this study is 7 to 8 times over the next 6 weeks.

What will I be asked to do?
The following procedures will be done strictly for research purposes:

- You will fill out 5 forms on the first visit: consent to participate in the study form, a general information form, and 3 questionnaires - the Life Orientation Test-Revised to measure optimism, the Power to Knowingly Participate in Change Tool to measure power, and the Well-Being Picture Scale to measure general well-being. This should take about one hour.
- During the time that you fill out the forms you will be given two consent forms that must be filled out by your obstetrical care provider before you are allowed to participate in yoga classes.
- After filling out all previously mentioned forms you will attend the next prenatal yoga class at one of the Healthy Moms® locations of your choice and continue to go to yoga class every week for a total of 6 weeks.
- You will practice yoga at least 3 times per week (at least twice at home and once in yoga class) and keep a record of when you practice yoga in a log that the investigator will give you.
- The Principle Investigator will give you your log and a yoga mat after you complete the first set of forms.
- After you finish your last yoga class you will meet with the investigator either at your last yoga class or within 1-2 weeks to complete 3 questionnaires that you filled out previously and to audio tape record your response to how yoga has affected your pregnancy.
- The recorded conversation will be kept on the investigators private, password-protected computer for a period of 3 years after which it will be permanently deleted from the hard drive. You have the option of submitting a written rather than audio taped response to the question if you do not want your answer to the question audio taped.
- You will not be identified by your name or other identifying information on any of the questionnaires or the recorded interview. All forms that you fill out will be kept in a locked file by the investigator and shredded and destroyed after 3 years.
- Your regular prenatal care will not change in any way.

What possible harms or discomforts might I experience if I take part in the research?

There are always risks (the chance of harm) when taking part in research. There is always a chance that any form of exercise may cause you some discomfort or harm and the procedures in this study are no different. I will do everything possible to keep you from being harmed. There are no known incidences of harm to mothers or unborn children as a result of yoga practice during pregnancy. However there is the potential for muscle strain or soreness

following stretching exercises and practicing the various positions that you will do in yoga classes. These discomforts should resolve with the usual relief measure discussed by your provider for common discomforts of pregnancy There may be other risks or side effects that occur which I do not know about at this time.

It is important for you to tell us as quickly as possible if you experience discomfort or pain.

Are there any reasons you might take me out of the research?
During the study, information about this research may become available that would be important to you. This includes information that, once learned, might cause you to change your mind about wanting to be in the study. I will tell you as soon as I can. This might include information about the side effects that are caused by taking part in this study. If that happens, I can tell you about these new side effects and let you decide whether you want to continue to take part in the research.

There may be reasons that I will need to take you out of the study, even if you want to stay in. I may find out that it is not safe for you to stay in the study. It may be that the side effects are so severe that I need to stop the study or take you out of the study to reduce your risk of harm. If I find that the research might harm you or that it is not providing enough of a benefit to justify the risks you are taking, I will attempt to contact you by phone, email, and notify you in writing if you will be withdrawn from the study. Any test, procedures, or follow-up care that you will need will be made available to should this occur. If I find that you have not or are unable to participate in weekly yoga classes and miss more than one yoga class I will need to take you out of the study. I may also find that you are not or cannot come for your study visits as scheduled. If those things are found to be true, I will need to take you out of the study.

What are the possible benefits I may experience from taking part in this research?
I do not know if you will get any benefits by taking part in this study. I do not know if yoga practice will help your pregnancy. That is why I am doing this research. This research should help us learn more about whether prenatal yoga will help.

Research of other women has suggested that yoga practice during pregnancy relieves muscle and back pain, reduces shortness of breath, enhances breathing during labor, and increases psychological and physical well-being. There may be no personal benefit from your participation but the information gained by doing this research may help others in the future.

Will I be paid for taking part in this research?
I will pay you $25.00 for the time you volunteered for this study after you completed six yoga classes.

What will it cost me to take part in this research?
It will not cost you any money to be part of the research. The sponsor of this research will pay the costs of prenatal yoga classes and yoga mats.

Who will know that I took part in this research and learn personal information about me?
To do this research, ECU and the people and organizations listed below may know that you took part in this research and may see information about you that is normally kept private. With your permission, these people may use your private information to do this research:

- The obstetrical care providers and staff who are taking care of you.
- The Principal Investigator
- All of the research sites' staff.
- Any agency of the federal, state, or local government that regulates this research. This includes the Department of Health and Human Services (DHHS), the Food and Drug Administration (FDA), the North Carolina Department of

Health, and the Office for Human Research Protections, the ECU University & Medical Center Institutional Review Board (UMCIRB) and the staff who have responsibility for overseeing your welfare during this research, and other ECU office staff who oversee this research.

- People designated by Wake County Human Services
- Individuals who serve on a committee called a data safety and monitoring board and its staff
- The Contract Research Organization and its staff

How will you keep the information you collect about me secure and how long will you keep it?

- The recorded conversation will be kept on the investigators private, password-protected computer for a period of 3 years after which it will be permanently deleted from the hard drive. You have the option of submitting a written rather than audio taped response to the question if you do not want your answer to the question audio taped.
- You will not be identified by your name or other identifying information on any of the questionnaires or the recorded interview. You will be identified only by a number assigned to you. All forms that you fill out will be kept in a locked file by the investigator and shredded and destroyed after 3 years.
- All forms, questionnaires, and audio-recorded information will be used only for the purposes of this study.
- The Principle Investigator will keep a copy of your name, address, phone numbers, and email addresses on a separate index card in a locked file cabinet apart from the rest of the study forms for study-related and emergency contact purposes only.

What if I decide I do not want to continue in this research?

Participating in this study is voluntary. If you decide not to be in this research after it has already started, you may stop at any time. You will not be penalized or criticized for stopping. You will not lose any benefits that you should normally receive.

What if I get sick or hurt while I am in this research?

If you need emergency care:

Call 911 or your health care provider at 919-212-7991 if you are a WCHS patient or 919-235-3369 if you are Dr. Lane's patient for help. It is important that you tell the doctors, the hospital or emergency room staff that you are taking part in a research study and the name of the Principal Investigator. If possible, take a copy of this consent form with you when you go.

Call the principal investigator as soon as you can. He/she needs to know that you are hurt or ill. Call Pamela Reis at 919-866-1262.

If you do NOT need emergency care, but have been hurt or get sick:

Contact Pamela Reis at 919-866-1262.

Call the principal investigator as soon as you can. As necessary, go to your regular doctor. It is important that you tell your regular doctor that you are participating in a research study. If possible, take a copy of this consent form with you when you go.

The ECU Medical Clinics may be able to give you the kind of help you need. However, you may need to get help from a different type of medical facility and your Principal Investigator will know best what you should do.

If you are harmed while taking part in this study:

If you believe you have been hurt or if you get sick because of something that is done during the study, you should call Pamela Reis at 919-866-1262 immediately. There are procedures in place to help attend to your injuries or provide care for you. Costs associated with this care will be billed in the ordinary manner, to you or your insurance company. However, some insurance companies will not pay bills that are related to research costs. You should check with your insurance about this. Medical costs that result from research-related harm may also not qualify for payments through Medicare, or Medicaid. You should talk to the Principal Investigator about this, if you have concerns.

Who should I contact if I have questions?

The person conducting this study will be available to answer any questions concerning this research, now or in the future. You may contact the Principal Investigator, Pamela Reis at 919-866-1262 (days, nights, and weekends).

If you have questions about your rights as someone taking part in research, you may call the ECU Institutional Review Board Office at phone number 252-744-2914 (days). If you would like to report a complaint or concern about this research study, you may call the Director of UMCIRB Office, at 252-744-1971.

Conflict of Interest Statement

The Principal Investigator has a potential conflict of interest that involves the fact that the Principal Investigator is an officer of the Board of Directors of the Society of Rogerian Scholars, the agency sponsoring this study. The money was awarded to the Principal Investigator as a scholarship to be used in whatever manner chosen and was not specified to be used for funding of research. The Principal Investigator has chosen to use the scholarship money awarded to cover part of the expenses incurred in this study in providing yoga classes and mats to the participants. Participant enrollment and study results do not depend upon funding received through the Society of Rogerian Scholars. This plan has been reviewed by the University & Medical Center Institutional Review Board and found to be adequate to protect your rights.

I have decided I want to take part in this research. What should I do now?

The person obtaining informed consent will ask you to read the following and if you agree, you should sign this form:

- I have read (or had read to me) all of the above information.
- I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
- I understand that I can stop taking part in this study at any time.
- By signing this informed consent form, I am not giving up any of my rights.
- I have been given a copy of this consent document, and it is mine to keep.

Participant's Name (PRINT) **Signature** **Date**

Person Obtaining Informed Consent: I have conducted the initial informed consent process. I have orally reviewed the contents of the consent document with the person who has signed above, and answered all of the person's questions about the research.

Person Obtaining Consent (PRINT) **Signature** **Date**

Principal Investigator (PRINT) **Signature** **Date**
(If other than person obtaining informed consent)

Provider Consent Form for Prenatal Yoga Participation

Contraindications for Prenatal Exercise*

Absolute Contraindications?	Yes	No	Relative Contraindications?	Yes	No
Does the patient have:			Does the patient have: (These indications must be discussed in depth with caregiver prior to starting any exercise program)		
1. Ruptured membranes or premature labor?			1. History of spontaneous abortion or premature labor?		
2. Persistent second/third trimester bleeding/placenta previa?			2. Mild/moderate cardiovascular or respiratory disease?		
3. Pregnancy induced hypertension, pre-eclampsia or toxemia?			3. Anemia or iron deficiencies? (Hgb < 10 g/dl)?		
4. Incompetent cervix?			4. Very low body fat, eating disorder (anorexia, bulimia)?		
5. Evidence of intrauterine growth restriction?			5. Twin pregnancy after 28th week?		
6. Multiple pregnancy of 3 or more fetuses?			6. Other significant medical condition?		
7. Uncontrolled Diabetes Type I, hypertension or thyroid disease, other serious cardiovascular, respiratory or systemic disease?			Please specify:		
PHYSICAL ACTIVITY/PRENATAL YOGA RECOMMENDATION	**Yes**	**No**	**Comments:**		

*Adapted from ACOG Committee Opinion Number 267, January 2002

I, _____ PLEASE PRINT (Patient's Name), have discussed my plans to participate in a prenatal yoga class during my current pregnancy with my health care provider and I have obtained his/her approval to begin participation.

Signed: _____ Date _____
(Patient's signature)

Name of Provider: _____
Address: _____
_____
Telephone: _____

Provider's Comments: _____
_____
_____

_____
(Provider's Signature)

PJR/2009

UMCIRB #: 09-0848

UNIVERSITY AND MEDICAL CENTER INSTITUTIONAL REVIEW BOARD REVISION FORM

UMCIRB #: 09-0848 **Date this form was completed:** 12/1/09
Title of research: Prenatal Yoga Practice and Patterning Change in Optimism, Power, and Well-being
Principal Investigator: Pamela J. Reis
Sponsor: Martha E. Rogers Scholarship Fund of the Society of Rogerian Scholars

Fund number for IRB fee collection (applies to all for-profit, private industry or pharmaceutical company sponsored project revisions requiring review by the convened UMCIRB committee): N/A

Fund	Organization	Account	Program	Activity (optional)
		73059		

Version of the most currently approved protocol: 11-16-09
Version of the most currently approved consent document: 11-16-09

CHECK ALL INSTITUTIONS OR SITES WHERE THIS RESEARCH STUDY WILL BE CONDUCTED:

- ☐ East Carolina University
- ☐ Pitt County Memorial Hospital, Inc
- ☐ Heritage Hospital
- ☐ Beaufort County Hospital
- ☐ Carteret General Hospital
- ☐ Boice-Willis Clinic
- ☒ Other Wake County Human Services Prenatal Clinic, Raleigh, NC (recruitment); HealthyMoms® Prenatal Yoga Studios, Raleigh, NC

The following items are being submitted for review and approval:

- ☐ Protocol: version or date
- ☐ Consent: version or date
- ☒ Additional material: version or date 12-01-09

Complete the following:

1. Level of IRB review required by sponsor: ☐ full ☒ expedited
2. Revision effects on risk analysis: ☐ increased ☒ no change ☐ decreased
3. Provide an explanation if there has been a greater than 60 day delay in the submission of this revision to the UMCIRB. N/A
4. Does this revision add any procedures, tests or medications? ☒ yes ☐ no If yes, describe the additional information: In addition to the previously approved forms, participants will be asked to complete the **Short Form-12 version 2** as a measure of general health.
5. Have participants been locally enrolled in this research study? ☐ yes ☒ no
6. Will the revision require previously enrolled participants to sign a new consent document? ☐ yes ☒ no

Briefly describe and provide a rationale for this revision It was determined by the researcher and Dr. Martha Alligood, the researcher's Dissertation Committee Chair that an additional measure of well-being will provide a more comprehensive analysis of the variables of interest in this study (optimism, power, and well-being). The Short Form-12 version 2 is a shorter version of the Short Form-36, a widely used and well-validated measure of general health and well-being that has been used in pregnant samples. Like the Short-Form 36, the Short-Form 12 measures 8 domains of physical and mental health. The researcher has contacted Quality Metric for permission to use the Short-Form 12 and authorization to use the tool is pending. **Attached is a copy of the Short Form-12.**

Pamela J. Reis | Pamela J. Reis | 12/1/09
Principal Investigator Signature | **Print** | **Date**

Box for Office Use Only

The above revision has been reviewed by:
☐ Full committee review on _____ ☑ Expedited review on 12/19/09

The following action has been taken:
☑ Approval for period of 12/19/09 to 11/23/10 (90)
☑ Approval by expedited review according to category 45CFR46.110
☐ See separate correspondence for further required action.

Lindsey Nipper MD | 12/19/09
Signature | **Print** | **Date**

UMCIRB #: 09-0848

UNIVERSITY AND MEDICAL CENTER INSTITUTIONAL REVIEW BOARD
REVISION FORM

UMCIRB #: 09-0848 **Date this form was completed:** 1/26/10

Title of research: PRENATAL YOGA PRACTICE AND PATTERNING CHANGE IN OPTIMISM, POWER, AND WELL-BEING

Principal Investigator: Pamela J. Reis, CNM, MSN, PhD(c)

Sponsor: Martha E. Rogers Scholarship Fund of the Society of Rogerian Scholars

Fund number for IRB fee collection (applies to all for-profit, private industry or pharmaceutical company sponsored project revisions requiring review by the convened UMCIRB committee): N/A

Fund	Organization	Account	Program	Activity (optional)
		73059		

Version of the most currently approved protocol: 12/19/09
Version of the most currently approved consent document: 11/25/09

CHECK ALL INSTITUTIONS OR SITES WHERE THIS RESEARCH STUDY WILL BE CONDUCTED:

- ☐ East Carolina University
- ☐ Pitt County Memorial Hospital, Inc
- ☐ Heritage Hospital
- ☐ Beaufort County Hospital
- ☐ Carteret General Hospital
- ☐ Boice-Willis Clinic
- ☒ Other Wake County Human Services Prenatal Clinic, Raleigh, NC (recruitment); HealthyMoms® Prenatal Yoga Studios, Raleigh, NC

The following items are being submitted for review and approval:

- ☐ Protocol: version or date
- ☒ Consent: version or date 1/26/10
- ☒ Additional material: version or date 1/26/10

Complete the following:

1. Level of IRB review required by sponsor: ☐ full ☒ expedited
2. Revision effects on risk analysis: ☐ increased ☐ no change ☒ decreased
3. Provide an explanation if there has been a greater than 60 day delay in the submission of this revision to the UMCIRB.
4. Does this revision add any procedures, tests or medications? ☐ yes ☒ no If yes, describe the additional information:
5. Have participants been locally enrolled in this research study? ☐ yes ☒ no
6. Will the revision require previously enrolled participants to sign a new consent document? ☐ yes ☒ no

Briefly describe and provide a rationale for this revision I submitted my study to the UMCIRB as greater than minimal risk, however once the committee met it was determined that the study met the criteria for no more than minimal risk and was approved as such. I am submitting this revision to the consent document to reflect the study's status as no more than minimal risk. I received a license from Quality Metric to use the Short Form-12 in my study and I am attaching the letter stating that license has been granted as well as a copy of the Short Form-12 to this application.

Pamela J. Reis — Pamela J. Reis — 1/26/10

Principal Investigator Signature | **Print** | **Date**

Box for Office Use Only

The above revision has been reviewed by:
☐ Full committee review on _____ ☑ Expedited review on 2/1/2010

The following action has been taken:
☑ Approval for period of 2/1/2010 to 11/25/2010
☑ Approval by expedited review according to category 45CFR46.110
☐ See separate correspondence for further required action.

S. Wiley Mayo MD — 2/1/2010

East Carolina University

University Health Systems of Eastern Carolina

Informed Consent to Participate in Research

Information to consider before taking part in research that has no more than minimal risk.

Title of Research Study: PRENATAL YOGA PRACTICE AND PATTERNING CHANGE IN OPTIMISM, POWER, AND WELL-BEING

Principal Investigator: Pamela J. Reis, CNM, MSN, PhD(c)
Institution/Department or Division: East Carolina University College of Nursing
Address: 3158 Health Sciences Building, Greenville, N.C. 27858
Telephone #: 919-866-1262 (home)

Researchers at East Carolina University (ECU) and Wake County Human Services study problems in society, health problems, environmental problems, behavior problems and the human condition. Our goal is to try to find ways to improve the lives of you and others. To do this, we need the help of people who are willing to take part in research.

The person who is in charge of this research is called the Principal Investigator. The Principal Investigator may have other research staff members who will perform some of the procedures such as handing out the questionnaires.

The person explaining the research to you is the Principle Investigator.

You may have questions that this form does not answer. If you do, feel free to ask the person explaining the study, as you go along. You may have questions later and you should ask those questions, as you think of them. There is no time limit for asking questions about this research.

You do not have to take part in this research. Take your time and think about the information that is provided. If you want, have a friend or family member go over this form with you before you decide. It is up to you. If you choose to be in the study, then you should sign the form when you are comfortable that you understand the information provided. If you do not want to take part in the study, you should not sign this form. That decision is yours and it is okay to decide not to volunteer.

Why is this research being done?
The purpose of this research study is to study the effects of prenatal yoga practice on optimism, power to participate knowingly in change and general well-being. Although yoga is practiced by many pregnant women there are very few studies that have reported the physical and psychological outcomes of yoga practice during pregnancy. I am asking you to take part in this research. However, the decision is yours to make. By doing this research, I hope to learn how practicing yoga can benefit women during pregnancy.

Why am I being invited to take part in this research?
You are being invited to take part in this research because you are age 18 and older, can read and speak English, are in the second or third trimester of pregnancy, have no pregnancy complications or medical conditions, have not taken yoga classes previously, and have an individual or family income of $45,000 per year or less. If you volunteer to take part in this study, you will be one of about 35 people to do so in the Triangle area.

Are there reasons I should not take part in this research?
I understand that I should not volunteer for this study if I am less than 18 years of age, have pregnancy or medical complications, cannot read or write English, have practiced yoga before, or have an income of more than $45,000 per year.

What other choices do I have if I do not take part in this research?
You have the choice of not taking part in this research study.

Where is the research going to take place and how long will it last?
The research procedures will be conducted at one of three Healthy Moms® prenatal yoga studios in one of 2 locations in Raleigh, NC or one in Cary, NC. You will need to come to one of the three studios located at 10930 Raven Ridge Road, Raleigh, NC or 215 Bickett Blvd, Raleigh, NC or 163 Pebblecreek, Cary, NC for 6 times or once per week during the study. Each of those visits will take about 1 hour. The total amount of time you will be asked to volunteer for this study is 7 to 8 times over the next 6 weeks.

What will I be asked to do?
The following procedures will be done strictly for research purposes:

- You will fill out 6 forms on the first visit: consent to participate in the study form, a general information form, and 4 questionnaires – the Short Form-12 to measure health, the Life Orientation Test-Revised to measure optimism, the Power to Knowingly Participate in Change Tool to measure power, and the Well-Being Picture Scale to measure general well-being. This should take about one hour.
- During the time that you fill out the forms you will be given two consent forms that must be filled out by your obstetrical care provider before you are allowed to participate in yoga classes.
- After filling out all previously mentioned forms you will attend the next prenatal yoga class at one of the Healthy Moms® locations of your choice and continue to go to yoga class every week for a total of 6 weeks.
- You will practice yoga at least 3 times per week (at least twice at home and once in yoga class) and keep a record of when you practice yoga in a log that the investigator will give you.
- The Principle Investigator will give you your log and a yoga mat after you complete the first set of forms.
- After you finish your last yoga class you will meet with the investigator either at your last yoga class or within 1-2 weeks to complete 4 questionnaires that you filled out previously and to audio tape record your response to how yoga has affected your pregnancy.
- The recorded conversation will be kept on the investigators private, password-protected computer for a period of 3 years after which it will be permanently deleted from the hard drive. You have the option of submitting a

written rather than audio taped response to the question if you do not want your answer to the question audio taped.

- You will not be identified by your name or other identifying information on any of the questionnaires or the recorded interview. All forms that you fill out will be kept in a locked file by the investigator and shredded and destroyed after 3 years.
- Your regular prenatal care will not change in any way.

What possible harms or discomforts might I experience if I take part in the research?

There are always risks (the chance of harm) when taking part in research. There is always a chance that any form of exercise may cause you some discomfort or harm and the procedures in this study are no different. I will do everything possible to keep you from being harmed. There are no known incidences of harm to mothers or unborn children as a result of yoga practice during pregnancy. However there is the potential for muscle strain or soreness following stretching exercises and practicing the various positions that you will do in yoga classes. These discomforts should resolve with the usual relief measure discussed by your provider for common discomforts of pregnancy There may be other risks or side effects that occur which I do not know about at this time.

It is important for you to tell us as quickly as possible if you experience discomfort or pain.

Are there any reasons you might take me out of the research?

During the study, information about this research may become available that would be important to you. This includes information that, once learned, might cause you to change your mind about wanting to be in the study. I will tell you as soon as I can. This might include information about the side effects that are caused by taking part in this study. If that happens, I can tell you about these new side effects and let you decide whether you want to continue to take part in the research.

There may be reasons that I will need to take you out of the study, even if you want to stay in. I may find out that it is not safe for you to stay in the study. It may be that the side effects are so severe that I need to stop the study or take you out of the study to reduce your risk of harm. If I find that the research might harm you or that it is not providing enough of a benefit to justify the risks you are taking, I will attempt to contact you by phone, email, and notify you in writing if you will be withdrawn from the study. Any test, procedures, or follow-up care that you will need will be made available to should this occur. If I find that you have not or are unable to participate in weekly yoga classes and miss more than one yoga class I will need to take you out of the study. I may also find that you are not or cannot come for your study visits as scheduled. If those things are found to be true, I will need to take you out of the study.

What are the possible benefits I may experience from taking part in this research?

I do not know if you will get any benefits by taking part in this study. I do not know if yoga practice will help your pregnancy. That is why I am doing this research. This research should help us learn more about whether prenatal yoga will help.

Research of other women has suggested that yoga practice during pregnancy relieves muscle and back pain, reduces shortness of breath, enhances breathing during labor, and increases psychological and physical well-being. There may be no personal benefit from your participation but the information gained by doing this research may help others in the future.

Will I be paid for taking part in this research?

I will pay you $25.00 for the time you volunteered for this study after you completed six yoga classes.

What will it cost me to take part in this research?
It will not cost you any money to be part of the research. The sponsor of this research will pay the costs of prenatal yoga classes and yoga mats.

Who will know that I took part in this research and learn personal information about me?
To do this research, ECU and the people and organizations listed below may know that you took part in this research and may see information about you that is normally kept private. With your permission, these people may use your private information to do this research:

- The obstetrical care providers and staff who are taking care of you.
- The Principal Investigator
- All of the research sites' staff.
- Any agency of the federal, state, or local government that regulates this research. This includes the Department of Health and Human Services (DHHS), the Food and Drug Administration (FDA), the North Carolina Department of Health, and the Office for Human Research Protections, the ECU University & Medical Center Institutional Review Board (UMCIRB) and the staff who have responsibility for overseeing your welfare during this research, and other ECU office staff who oversee this research.
- People designated by Wake County Human Services
- Individuals who serve on a committee called a data safety and monitoring board and its staff
- The Contract Research Organization and its staff

How will you keep the information you collect about me secure? How long will you keep it?

- The recorded conversation will be kept on the investigators private, password-protected computer for a period of 3 years after which it will be permanently deleted from the hard drive. You have the option of submitting a written rather than audio taped response to the question if you do not want your answer to the question audio taped.
- You will not be identified by your name or other identifying information on any of the questionnaires or the recorded interview. You will be identified only by a number assigned to you. All forms that you fill out will be kept in a locked file by the investigator and shredded and destroyed after 3 years.
- All forms, questionnaires, and audio-recorded information will be used only for the purposes of this study.
- The Principle Investigator will keep a copy of your name, address, phone numbers, and email addresses on a separate index card in a locked file cabinet apart from the rest of the study forms for study-related and emergency contact purposes only.

What if I decide I do not want to continue in this research?
Participating in this study is voluntary. If you decide not to be in this research after it has already started, you may stop at any time. You will not be penalized or criticized for stopping. You will not lose any benefits that you should normally receive.

What if I get sick or hurt while I am in this research?
If you need emergency care:
Call 911 or your health care provider at 919-212-7991 if you are a WCHS patient or 919-235-3369 if you are Dr. Lane's patient for help. It is important that you tell the doctors, the hospital or emergency room staff that you are taking part in a research study and the name of the Principal Investigator. If possible, take a copy of this consent form with you when you go.

Call the principal investigator as soon as you can. He/she needs to know that you are hurt or ill. Call Pamela Reis at 919-866-1262.

If you do NOT need emergency care, but have been hurt or get sick:
Contact Pamela Reis at 919-866-1262.

Call the principal investigator as soon as you can. As necessary, go to your regular doctor. It is important that you tell your regular doctor that you are participating in a research study. If possible, take a copy of this consent form with you when you go.

The ECU Medical Clinics may be able to give you the kind of help you need. However, you may need to get help from a different type of medical facility and your Principal Investigator will know best what you should do.

If you are harmed while taking part in this study:
If you believe you have been hurt or if you get sick because of something that is done during the study, you should call Pamela Reis at 919-866-1262 immediately. There are procedures in place to help attend to your injuries or provide care for you. Costs associated with this care will be billed in the ordinary manner, to you or your insurance company. However, some insurance companies will not pay bills that are related to research costs. You should check with your insurance about this. Medical costs that result from research-related harm may also not qualify for payments through Medicare, or Medicaid. You should talk to the Principal Investigator about this, if you have concerns.

Who should I contact if I have questions?

The person conducting this study will be available to answer any questions concerning this research, now or in the future. You may contact the Principal Investigator, Pamela Reis at 919-866-1262 (days, nights, and weekends).

If you have questions about your rights as someone taking part in research, you may call the ECU Institutional Review Board Office at phone number 252-744-2914 (days). If you would like to report a complaint or concern about this research study, you may call the Director of UMCIRB Office, at 252-744-1971.

Conflict of Interest Statement

The Principal Investigator has a potential conflict of interest that involves the fact that the Principal Investigator is an officer of the Board of Directors of the Society of Rogerian Scholars, the agency sponsoring this study. The money was awarded to the Principal Investigator as a scholarship to be used in whatever manner chosen and was not specified to be used for funding of research. The Principal Investigator has chosen to use the scholarship money awarded to cover part of the expenses incurred in this study in providing yoga classes and mats to the participants. Participant enrollment and study results do not depend upon funding received through the Society of Rogerian Scholars. This plan has been reviewed by the University & Medical Center Institutional Review Board and found to be adequate to protect your rights.

I have decided I want to take part in this research. What should I do now?

The person obtaining informed consent will ask you to read the following and if you agree, you should sign this form:

- I have read (or had read to me) all of the above information.
- I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
- I understand that I can stop taking part in this study at any time.
- By signing this informed consent form, I am not giving up any of my rights.
- I have been given a copy of this consent document, and it is mine to keep.

Participant's Name (PRINT)	Signature	Date

Person Obtaining Informed Consent: I have conducted the initial informed consent process. I have orally reviewed the contents of the consent document with the person who has signed above, and answered all of the person's questions about the research.

Person Obtaining Consent (PRINT)	Signature	Date

Principal Investigator (PRINT) (If other than person obtaining informed consent)	Signature	Date

East Carolina University

University Health Systems of Eastern Carolina

Informed Consent to Participate in Research

Information to consider before taking part in research that has no more than minimal risk.

Title of Research Study: PRENATAL YOGA PRACTICE AND PATTERNING CHANGE IN OPTIMISM, POWER, AND WELL-BEING

Principal Investigator: Pamela J. Reis, CNM, MSN, PhD(c)
Institution/Department or Division: East Carolina University College of Nursing
Address: 3158 Health Sciences Building, Greenville, N.C. 27858
Telephone #: 919-866-1262 (home)

Researchers at East Carolina University (ECU) study problems in society, health problems, environmental problems, behavior problems and the human condition. Our goal is to try to find ways to improve the lives of you and others. To do this, we need the help of people who are willing to take part in research.

The person who is in charge of this research is called the Principal Investigator. The Principal Investigator may have other research staff members who will perform some of the procedures such as handing out the questionnaires.

The person explaining the research to you is the Principle Investigator.

You may have questions that this form does not answer. If you do, feel free to ask the person explaining the study, as you go along. You may have questions later and you should ask those questions, as you think of them. There is no time limit for asking questions about this research.

You do not have to take part in this research. Take your time and think about the information that is provided. If you want, have a friend or family member go over this form with you before you decide. It is up to you. If you choose to be in the study, then you should sign the form when you are comfortable that you understand the information provided. If you do not want to take part in the study, you should not sign this form. That decision is yours and it is okay to decide not to volunteer.

Why is this research being done?

The purpose of this research study is to study the effects of prenatal yoga practice on optimism, power to participate knowingly in change and general well-being. Although yoga is practiced by many pregnant women there are very few studies that have reported the physical and psychological outcomes of yoga practice during pregnancy. I am asking you to take part in this research. However, the decision is yours to make. By doing this research, I hope to learn how practicing yoga can benefit women during pregnancy.

Why am I being invited to take part in this research?

You are being invited to take part in this research because you are age 18 and older, can read and speak English, are in the second or third trimester of pregnancy, have no pregnancy complications or medical conditions, have not taken yoga classes previously, and have an individual or family income of $45,000 per year or less. If you volunteer to take part in this study, you will be one of about 35 people to do so in the Triangle area.

Are there reasons I should not take part in this research?

I understand that I should not volunteer for this study if I am less than 18 years of age, have pregnancy or medical complications, cannot read or write English, have practiced yoga before, or have an income of more than $45,000 per year.

What other choices do I have if I do not take part in this research?

You have the choice of not taking part in this research study.

Where is the research going to take place and how long will it last?

The research procedures will be conducted at one of four Healthy Moms® prenatal yoga studios in Wake County, North Carolina. You will need to come to one of the three studios located in Raleigh (at Ladies Fitness and Wellness, Evolve Yoga, or Love in Bloom Maternity) or in Cary (at Kildaire Farms Racquet and Swim Club) for 6 times or once per week during the study. Each of those visits will take about 1 hour. The total amount of time you will be asked to volunteer for this study is 7 to 8 times over the next 6 weeks.

What will I be asked to do?

The following procedures will be done strictly for research purposes:

- You will fill out 6 forms on the first visit: consent to participate in the study form, a general information form, and 4 questionnaires – the Short Form-12 to measure health, the Life Orientation Test-Revised to measure optimism, the Power to Knowingly Participate in Change Tool to measure power, and the Well-Being Picture Scale to measure general well-being. This should take about one hour.
- During the time that you fill out the forms you will be given two consent forms that must be filled out by your obstetrical care provider before you are allowed to participate in yoga classes.
- After filling out all previously mentioned forms you will attend the next prenatal yoga class at one of the Healthy Moms® locations of your choice and continue to go to yoga class every week for a total of 6 weeks.
- You will practice yoga at least 3 times per week (at least twice at home and once in yoga class) and keep a record of when you practice yoga in a log that the investigator will give you.
- The Principle Investigator will give you your log and a yoga mat after you complete the first set of forms.
- After you finish your last yoga class you will meet with the investigator either at your last yoga class or within 1-2 weeks to complete 4 questionnaires that you filled out previously and to audio tape record your response to how yoga has affected your pregnancy.
- The recorded conversation will be kept on the investigators private, password-protected computer for a period of 3 years after which it will be permanently deleted from the hard drive. You have the option of submitting a

written rather than audio taped response to the question if you do not want your answer to the question audio taped.
- You will not be identified by your name or other identifying information on any of the questionnaires or the recorded interview. All forms that you fill out will be kept in a locked file by the investigator and shredded and destroyed after 3 years.
- Your regular prenatal care will not change in any way.

What possible harms or discomforts might I experience if I take part in the research?

There are always risks (the chance of harm) when taking part in research. There is always a chance that any form of exercise may cause you some discomfort or harm and the procedures in this study are no different. I will do everything possible to keep you from being harmed. There are no known incidences of harm to mothers or unborn children as a result of yoga practice during pregnancy. However there is the potential for muscle strain or soreness following stretching exercises and practicing the various positions that you will do in yoga classes. These discomforts should resolve with the usual relief measure discussed by your provider for common discomforts of pregnancy There may be other risks or side effects that occur which I do not know about at this time.

It is important for you to tell us as quickly as possible if you experience discomfort or pain.

Are there any reasons you might take me out of the research?

During the study, information about this research may become available that would be important to you. This includes information that, once learned, might cause you to change your mind about wanting to be in the study. I will tell you as soon as I can. This might include information about the side effects that are caused by taking part in this study. If that happens, I can tell you about these new side effects and let you decide whether you want to continue to take part in the research.

There may be reasons that I will need to take you out of the study, even if you want to stay in. I may find out that it is not safe for you to stay in the study. It may be that the side effects are so severe that I need to stop the study or take you out of the study to reduce your risk of harm. If I find that the research might harm you or that it is not providing enough of a benefit to justify the risks you are taking, I will attempt to contact you by phone, email, and notify you in writing if you will be withdrawn from the study. Any test, procedures, or follow-up care that you will need will be made available to should this occur. If I find that you have not or are unable to participate in weekly yoga classes and miss more than one yoga class I will need to take you out of the study. I may also find that you are not or cannot come for your study visits as scheduled. If those things are found to be true, I will need to take you out of the study.

What are the possible benefits I may experience from taking part in this research?

I do not know if you will get any benefits by taking part in this study. I do not know if yoga practice will help your pregnancy. That is why I am doing this research. This research should help us learn more about whether prenatal yoga will help.

Research of other women has suggested that yoga practice during pregnancy relieves muscle and back pain, reduces shortness of breath, enhances breathing during labor, and increases psychological and physical well-being. There may be no personal benefit from your participation but the information gained by doing this research may help others in the future.

Will I be paid for taking part in this research?

I will pay you $25.00 for the time you volunteered for this study after you completed six yoga classes.

What will it cost me to take part in this research?
It will not cost you any money to be part of the research. The sponsor of this research will pay the costs of prenatal yoga classes and yoga mats.

Who will know that I took part in this research and learn personal information about me?
To do this research, ECU and the people and organizations listed below may know that you took part in this research and may see information about you that is normally kept private. With your permission, these people may use your private information to do this research:

- The obstetrical care providers and staff who are taking care of you.
- The Principal Investigator
- All of the research sites' staff.
- Any agency of the federal, state, or local government that regulates this research. This includes the Department of Health and Human Services (DHHS), the Food and Drug Administration (FDA), the North Carolina Department of Health, and the Office for Human Research Protections, the ECU University & Medical Center Institutional Review Board (UMCIRB) and the staff who have responsibility for overseeing your welfare during this research, and other ECU office staff who oversee this research.
- People designated by Wake County Human Services
- Individuals who serve on a committee called a data safety and monitoring board and its staff
- The Contract Research Organization and its staff

How will you keep the information you collect about me secure? How long will you keep it?

- The recorded conversation will be kept on the investigators private, password-protected computer for a period of 3 years after which it will be permanently deleted from the hard drive. You have the option of submitting a written rather than audio taped response to the question if you do not want your answer to the question audio taped.
- You will not be identified by your name or other identifying information on any of the questionnaires or the recorded interview. You will be identified only by a number assigned to you. All forms that you fill out will be kept in a locked file by the investigator and shredded and destroyed after 3 years.
- All forms, questionnaires, and audio-recorded information will be used only for the purposes of this study.
- The Principle Investigator will keep a copy of your name, address, phone numbers, and email addresses on a separate index card in a locked file cabinet apart from the rest of the study forms for study-related and emergency contact purposes only.

What if I decide I do not want to continue in this research?
Participating in this study is voluntary. If you decide not to be in this research after it has already started, you may stop at any time. You will not be penalized or criticized for stopping. You will not lose any benefits that you should normally receive.

What if I get sick or hurt while I am in this research?
If you need emergency care:
Call 911 or your health care provider at 919-212-7991 if you are a WCHS patient. If you are not a WCHS patient then please contact your obstetrical care provider for help. It is important that you tell the doctors, the hospital or emergency room staff that you are taking part in a research study and the name of the Principal Investigator. If possible, take a copy of this consent form with you when you go.

Call the principal investigator as soon as you can. She needs to know that you are hurt or ill. Call Pamela Reis at 919-866-1262.

If you do NOT need emergency care, but have been hurt or get sick:
Contact Pamela Reis at 919-866-1262.

Call the principal investigator as soon as you can. As necessary, go to your regular doctor. It is important that you tell your regular doctor that you are participating in a research study. If possible, take a copy of this consent form with you when you go.

The ECU Medical Clinics may be able to give you the kind of help you need. However, you may need to get help from a different type of medical facility and your Principal Investigator will know best what you should do.

If you are harmed while taking part in this study:
If you believe you have been hurt or if you get sick because of something that is done during the study, you should call Pamela Reis at 919-866-1262 immediately. There are procedures in place to help attend to your injuries or provide care for you. Costs associated with this care will be billed in the ordinary manner, to you or your insurance company. However, some insurance companies will not pay bills that are related to research costs. You should check with your insurance about this. Medical costs that result from research-related harm may also not qualify for payments through Medicare, or Medicaid. You should talk to the Principal Investigator about this, if you have concerns.

Who should I contact if I have questions?

The person conducting this study will be available to answer any questions concerning this research, now or in the future. You may contact the Principal Investigator, Pamela Reis at 919-866-1262 (days, nights, and weekends).

If you have questions about your rights as someone taking part in research, you may call the ECU Institutional Review Board Office at phone number 252-744-2914 (days). If you would like to report a complaint or concern about this research study, you may call the Director of UMCIRB Office, at 252-744-1971.

Conflict of Interest Statement

The Principal Investigator has a potential conflict of interest that involves the fact that the Principal Investigator is an officer of the Board of Directors of the Society of Rogerian Scholars, the agency sponsoring this study. The money was awarded to the Principal Investigator as a scholarship to be used in whatever manner chosen and was not specified to be used for funding of research. The Principal Investigator has chosen to use the scholarship money awarded to cover part of the expenses incurred in this study in providing yoga classes and mats to the participants. Participant enrollment and study results do not depend upon funding received through the Society of Rogerian Scholars. This plan has been reviewed by the University & Medical Center Institutional Review Board and found to be adequate to protect your rights.

I have decided I want to take part in this research. What should I do now?

The person obtaining informed consent will ask you to read the following and if you agree, you should sign this form:

- I have read (or had read to me) all of the above information.
- I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
- I understand that I can stop taking part in this study at any time.
- By signing this informed consent form, I am not giving up any of my rights.
- I have been given a copy of this consent document, and it is mine to keep.

Participant's Name (PRINT)	**Signature**	**Date**

Person Obtaining Informed Consent: I have conducted the initial informed consent process. I have orally reviewed the contents of the consent document with the person who has signed above, and answered all of the person's questions about the research.

Person Obtaining Consent (PRINT)	**Signature**	**Date**

Principal Investigator (PRINT)	**Signature**	**Date**

(If other than person obtaining informed consent)

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
1L-09 Brody Medical Sciences Building• 600 Moye Boulevard • Greenville, NC 27834
Office 252-744-2914 • Fax 252-744-2284 • www.ecu.edu/irb

TO: Pamela Reis, CNM, MSN, PhD-C, College of Nursing, ECU

FROM: UMCIRB

DATE: December 9, 2010

RE: Expedited Continuing Review of a Research Study

TITLE: "Prenatal Yoga Practice and Patterning Change In Optimism, Power, and Well Being"

UMCIRB #09-0848

The above referenced research study was initially reviewed and approved by expedited review on 11/24/09. This research study has undergone a subsequent continuing review using expedited review on 12/7/10. This research study is eligible for expedited review under categories 4, 6, 7: collection of data through noninvasive procedures (not involving general anesthesia or sedation) routinely employed in clinical practice, excluding procedures involving x-rays or microwaves; collection of data from voice, video, digital, or image recordings made for research purposes; and research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

The Chairperson (or designee) deemed this Society of Rogerian Scholars/Sigma Theta Tau International, Beta Nu Chapter Research Award sponsored study **no more than minimal risk** requiring a continuing review in **12 months**. Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The investigator must adhere to all reporting requirements for this study.

The above referenced research study has been given approval for the period of **12/7/10** to **12/6/11**. The approval includes the following items:

- Continuing Review Form (dated 11/12/10)
- Dissertation Protocol
- Protocol Summary
- Informed consent (dated 5/10/10)
- Provider Consent Form for Prenatal Yoga Participation
- Demographic Questionnaire
- LOT-R (Life Orientation Test-Revised)
- Power to Knowingly Participate in Change Tool (version 2)
- Well-Being Picture Scale
- Short Form 12
- Study Flyer

The Chairperson (or designee) does not have a conflict of interest on this study.

The UMCIRB applies 45 CFR 46, Subparts A-D, to all research reviewed by the UMCIRB regardless of the funding source. 21 CFR 50 and 21 CFR 56 are applied to all research studies under the Food and Drug Administration regulation. The UMCIRB follows applicable International Conference on Harmonisation Good Clinical Practice guidelines.

Appendix B

Demographic Data Form

ID # _____

TODAY'S DATE: _____

Please share the following information about yourself. This information will be used to compare similarities and differences among women in the yoga study.

YOUR DUE DATE: _____

RACE (Please check one):
African-American/Black _____
Native American/American Indian _____
Caucasian _____
Hispanic _____
Asian/Pacific Islander _____
Other (please write in) _____

YOUR AGE _____

PLEASE CHECK THE HIGHEST LEVEL OF EDUCATION THAT YOU HAVE COMPLETED:

Grade school ___
Some high school ___
Graduated high school ___
Some college, no degree ___
Graduated college- associate degree ___
Graduated college- bachelor's degree ___
Graduate school, no degree ___
Graduate degree ___
Doctorate degree ___

NUMBER OF PREGANCIES YOU HAVE HAD (Including this pregnancy): _____
How many infants delivered at full-term (37 weeks or greater)? _____
How many preterm infants (36 weeks or less)? _____
How many miscarriages or abortions? _____
How many living children do you have? _____
Do your children live at home with you? _____

MARITAL STATUS (Please check one):
Married _____
Separated _____
Divorced _____
Single, not living with the baby's father _____
Single, living with the baby's father _____

INCLUDING YOURSELF, HOW MANY PEOPLE LIVE IN YOUR HOME? _____

ARE YOU CURRENTLY EMPLOYED?

_____ Yes Hours per week _____

_____ No

WHAT IS YOUR ANNUAL FAMILY INCOME? PLEASE CHECK ONE OF THE FOLLOWING:

_____ Less than 20,000 per year

_____ Less than 40,000 per year

_____ More than 40,000 per year

DO YOU CURRENTLY EXERCISE?

Yes ____

No ____

IF YOU ANSWERED YES TO THE QUESTION ABOVE, PLEASE WRITE WHAT YOU DO FOR EXERCISE, HOW LONG YOU EXERCISE EACH TIME, AND HOW MANY DAYS PER WEEK YOU EXERCISE.

TYPE OF EXERCISE: _____

HOW LONG EACH TIME: _____

HOW MANY DAYS PER WEEK: _____

HAVE YOU EVER PRACTICED YOGA BEFORE?

Yes ____

No ____

ARE YOU CURRENTLY PRACTICING YOGA?

Yes _____

Number of times per week _____
How long do you practice each time? _____

No _____

On a scale of 1 to 4, how beneficial do you think yoga is to pregnant women? (Circle one)

1	2	3	4
Very beneficial	Beneficial	Somewhat beneficial	Not beneficial

Do you use or practice any of the following complementary/alternative health methods? Please place a check mark by the method and comment in the space provided as appropriate.

_____ Relaxation

_____ Guided imagery

_____ Meditation

_____ Breath work

_____ Herbs (please specify which herbs you use)
_____
_____

_____ Massage

_____ Other therapies (please specify what therapies)
_____
_____

How would you rate your health at the present time?
a. Excellent
b. Very good
c. Good
d. Fair
e. Poor

How would you rate your health now compared to before you were pregnant?
a. Much better
b. Somewhat better
c. About the same
d. Somewhat worse
e. Much worse

Have you had any complications or problems during this pregnancy?

Yes ___ please state what problems you have been experiencing

No____

Has your health care provider told you to limit your activity during this pregnancy?

Yes ____ please explain what your limitations are

No _____

Is there anything going on right now that has a positive or negative effect on your pregnancy?

Yes _____ Please say what's effecting your pregnancy

No _____

Thank you for taking the time to complete this form.

Appendix C

Life Orientation Test-Revised

Revised Life Orientation Test (LOT-R)

Instructions:
Please answer the following questions about yourself by indicating the extent of your agreement using the following scale:

[0] = strongly disagree
[1] = disagree
[2] = neutral
[3] = agree
[4] = strongly agree

Be as honest as you can throughout, and try not to let your responses to one question influence your response to other questions. There are no right or wrong answers.

_____ 1. In uncertain times, I usually expect the best.
_____ 2. It's easy for me to relax.
_____ 3. If something can go wrong for me, it will.
_____ 4. I'm always optimistic about my future.
_____ 5. I enjoy my friends a lot.
_____ 6. It's important for me to keep busy.
_____ 7. I hardly ever expect things to go my way.
_____ 8. I don't get upset too easily.
_____ 9. I rarely count on good things happening to me.
_____ 10. Overall, I expect more good things to happen to me than bad.

Scoring:
1. Reverse code items 3, 7, and 9 prior to scoring (0=4) (1=3) (2=2) (3=1) (4=0).
2. Sum items 1, 3, 4, 7, 9, and 10 to obtain an overall score.

Note Items 2, 5, 6, and 8 are filler items only. They are not scored as part of the revised scale.

The revised scale was constructed in order to eliminate two items from the original scale, which dealt more with coping style than with positive expectations for future outcomes. The correlation between the revised scale and the original scale is .95.

Reference:
Scheier, M.F., Carver C.S., and Bridges, M.W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A re-evaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, **67**, 1063-1078.

Appendix D

Power to Knowingly Participate In Change Version II and

Power to Knowingly Participate In Change Version II Scoring Guide

INTRODUCTION TO BARRETT'S PKPCT

The PKPCT is designed to help you describe the meaning of day-to-day change in your life. Four indicators of experiencing change are:

AWARENESS
CHOICES
FREEDOM TO ACT INTENTIONALLY
INVOLVEMENT IN CREATING CHANGE

It takes about 10 minutes to complete the PKPCT.

INSTRUCTIONS FOR COMPLETING BARRETT'S PKPCT

For each indicator, there are 13 lines. There are words at both ends of each line. The meaning of the words are opposite to each other. There are 7 spaces between each pair of words which provide a range of possible responses. Place an "X" in the space along the line that best describes the meaning of the indicator (AWARENESS, CHOICES, FREEDOM TO ACT INTENTIONALLY, or INVOLVEMENT IN CREATING CHANGE) for you at this time.

For example:
Under the indicator CHOICES, if your CHOICES are quite closely described as "informed," your answer might look like this:

informed ___|_X_|___|___|___|___|___ uninformed

If your CHOICES are quite closely described as "uninformed," your answer might look like this:

informed ___|___|___|___|___|_X_|___ uninformed

If your CHOICES are equally "informed" and "uninformed," place an "X" in the middle space on the line. Your answer might look like this:

informed ___|___|___|_X_|___|___|___ uninformed

REMEMBER:

- There are no right or wrong answers.
- Record your first impression for **each** pair of words.
- You can place an "X" in any space along the line that best describes the meaning the indicator has for you at this time.
- Mark only one "X" for each pair of words.
- Mark an "X" for every pair of words.

PLEASE BEGIN TO MARK YOUR X'S ON BARRETT'S PKPCT

(Please go to NEXT PAGE and continue)

BARRETT PKPCT, Version II

MARK AN "X" AS DESCRIBED IN THE INSTRUCTIONS

MY AWARENESS IS

profound	___	___	___	___	___	___	___ superficial
avoiding	___	___	___	___	___	___	___ seeking
valuable	___	___	___	___	___	___	___ worthless
unintentional	___	___	___	___	___	___	___ intentional
timid	___	___	___	___	___	___	___ assertive
leading	___	___	___	___	___	___	___ following
chaotic	___	___	___	___	___	___	___ orderly
expanding	___	___	___	___	___	___	___ shrinking
pleasant	___	___	___	___	___	___	___ unpleasant
uninformed	___	___	___	___	___	___	___ informed
free	___	___	___	___	___	___	___ constrained
unimportant	___	___	___	___	___	___	___ important
unpleasant	___	___	___	___	___	___	___ pleasant

MARK AN "X" AS DESCRIBED IN THE INSTRUCTIONS

MY CHOICES ARE

shrinking	___	___	___	___	___	___	___ expanding
seeking	___	___	___	___	___	___	___ avoiding
assertive	___	___	___	___	___	___	___ timid
important	___	___	___	___	___	___	___ unimportant
orderly	___	___	___	___	___	___	___ chaotic
intentional	___	___	___	___	___	___	___ unintentional
unpleasant	___	___	___	___	___	___	___ pleasant
constrained	___	___	___	___	___	___	___ free
worthless	___	___	___	___	___	___	___ valuable
following	___	___	___	___	___	___	___ leading
superficial	___	___	___	___	___	___	___ profound
informed	___	___	___	___	___	___	___ uninformed
timid	___	___	___	___	___	___	___ assertive

(Please go to NEXT PAGE and continue)

BARRETT PKPCT, Version II, PART 2

MARK AN "X" AS DESCRIBED IN THE INSTRUCTIONS

MY FREEDOM TO ACT INTENTIONALLY IS

timid	___	___	___	___	___	___	___	assertive
uninformed	___	___	___	___	___	___	___	informed
leading	___	___	___	___	___	___	___	following
profound	___	___	___	___	___	___	___	superficial
expanding	___	___	___	___	___	___	___	shrinking
unimportant	___	___	___	___	___	___	___	important
valuable	___	___	___	___	___	___	___	worthless
chaotic	___	___	___	___	___	___	___	orderly
avoiding	___	___	___	___	___	___	___	seeking
free	___	___	___	___	___	___	___	constrained
unintentional	___	___	___	___	___	___	___	intentional
pleasant	___	___	___	___	___	___	___	unpleasant
orderly	___	___	___	___	___	___	___	chaotic

MARK AN "X" AS DESCRIBED IN THE INSTRUCTIONS

MY INVOLVEMENT IN CREATING CHANGE IS

unintentional	___	___	___	___	___	___	___	intentional
expanding	___	___	___	___	___	___	___	shrinking
profound	___	___	___	___	___	___	___	superficial
chaotic	___	___	___	___	___	___	___	orderly
free	___	___	___	___	___	___	___	constrained
valuable	___	___	___	___	___	___	___	worthless
uninformed	___	___	___	___	___	___	___	informed
avoiding	___	___	___	___	___	___	___	seeking
leading	___	___	___	___	___	___	___	following
unimportant	___	___	___	___	___	___	___	important
timid	___	___	___	___	___	___	___	assertive
pleasant	___	___	___	___	___	___	___	unpleasant
superficial	___	___	___	___	___	___	___	profound

THANK YOU

SCORING GUIDE

Scores are computed by assigning numbers from the scoring guide that correspond to participants' responses on the instrument.

BARRETT PKPCT, Version II

MARK AN "X" AS DESCRIBED IN THE INSTRUCTIONS

MY AWARENESS IS

profound	7	6	5	4	3	2	1	superficial
avoiding	1	2	3	4	5	6	7	seeking
valuable	7	6	5	4	3	2	1	worthless
unintentional	1	2	3	4	5	6	7	intentional
timid	1	2	3	4	5	6	7	assertive
leading	7	6	5	4	3	2	1	following
chaotic	1	2	3	4	5	6	7	orderly
expanding	7	6	5	4	3	2	1	shrinking
pleasant	7	6	5	4	3	2	1	unpleasant
uninformed	1	2	3	4	5	6	7	informed
free	7	6	5	4	3	2	1	constrained
unimportant	1	2	3	4	5	6	7	important
unpleasant	1	2	3	4	5	6	7	pleasant

MARK AN "X" AS DESCRIBED IN THE INSTRUCTIONS

MY CHOICES ARE

shrinking	1	2	3	4	5	6	7	expanding
seeking	7	6	5	4	3	2	1	avoiding
assertive	7	6	5	4	3	2	1	timid
important	7	6	5	4	3	2	1	unimportant
orderly	7	6	5	4	3	2	1	chaotic
intentional	7	6	5	4	3	2	1	unintentional
unpleasant	1	2	3	4	5	6	7	pleasant
constrained	1	2	3	4	5	6	7	free
worthless	1	2	3	4	5	6	7	valuable
following	1	2	3	4	5	6	7	leading
superficial	1	2	3	4	5	6	7	profound
informed	7	6	5	4	3	2	1	uninformed
timid	1	2	3	4	5	6	7	assertive

BARRETT PKPCT, Version II, PART 2

MARK AN "X" AS DESCRIBED IN THE INSTRUCTIONS

MY FREEDOM TO ACT INTENTIONALLY IS

timid	1	2	3	4	5	6	7	assertive
uninformed	1	2	3	4	5	6	7	informed
leading	7	6	5	4	3	2	1	following
profound	7	6	5	4	3	2	1	superficial
expanding	7	6	5	4	3	2	1	shrinking
unimportant	1	2	3	4	5	6	7	important
valuable	7	6	5	4	3	2	1	worthless
chaotic	1	2	3	4	5	6	7	orderly
avoiding	1	2	3	4	5	6	7	seeking
free	7	6	5	4	3	2	1	constrained
unintentional	1	2	3	4	5	6	7	intentional
pleasant	7	6	5	4	3	2	1	unpleasant
orderly	7	6	5	4	3	2	1	chaotic

MARK AN "X" AS DESCRIBED IN THE INSTRUCTIONS

MY INVOLVEMENT IN CREATING CHANGE IS

unintentional	1	2	3	4	5	6	7	intentional
expanding	7	6	5	4	3	2	1	shrinking
profound	7	6	5	4	3	2	1	superficial
chaotic	1	2	3	4	5	6	7	orderly
free	7	6	5	4	3	2	1	constrained
valuable	7	6	5	4	3	2	1	worthless
uninformed	1	2	3	4	5	6	7	informed
avoiding	1	2	3	4	5	6	7	seeking
leading	7	6	5	4	3	2	1	following
unimportant	1	2	3	4	5	6	7	important
timid	1	2	3	4	5	6	7	assertive
pleasant	7	6	5	4	3	2	1	unpleasant
superficial	1	2	3	4	5	6	7	profound

The is adj sc scores are summed. The last adjective scare is a test-retest ITEM. It is not included in the score. Scoring provides a score for each of the 4 concepts as well as a total score of all 4 concepts.

BARRETT PKPCT, Version II

MARK AN "X" AS DESCRIBED IN THE INSTRUCTIONS

MY AWARENESS IS

profound		x						superficial	6
avoiding			x					seeking	3
valuable				x				worthless	4
unintentional				x				intentional	4
timid			x					assertive	3
leading					x			following	3
chaotic						x		orderly	6
expanding							x	shrinking	1
pleasant						x		unpleasant	2
uninformed						x		informed	6
free					x			constrained	3
unimportant			x					important	3 (44)
unpleasant		x						pleasant	2

MARK AN "X" AS DESCRIBED IN THE INSTRUCTIONS

MY CHOICES ARE

shrinking		x						expanding	2
seeking			x					avoiding	5
assertive				x				timid	4
important			x					unimportant	5
orderly		x						chaotic	6
intentional	x							unintentional	7
unpleasant				x				pleasant	4
constrained						x		free	6
worthless							x	valuable	7
following					x			leading	5
superficial			x					profound	3
informed				x				uninformed	4 (58)
timid			x					assertive	3

BARRETT PKPCT, Version II, PART 2

MARK AN "X" AS DESCRIBED IN THE INSTRUCTIONS

MY FREEDOM TO ACT INTENTIONALLY IS

timid		x						assertive	2
uninformed			x					informed	3
leading				x				following	4
profound					x			superficial	3
expanding							x	shrinking	1
unimportant				x				important	4
valuable					x			worthless	3
chaotic						x		orderly	6
avoiding					x			seeking	5
free				x				constrained	4
unintentional		x						intentional	2
pleasant				x				unpleasant	4 (41)
orderly		x						chaotic	6

MARK AN "X" AS DESCRIBED IN THE INSTRUCTIONS

MY INVOLVEMENT IN CREATING CHANGE IS

unintentional							x	intentional	7
expanding						x		shrinking	2
profound					x			superficial	3
chaotic				x				orderly	4
free					x			constrained	3
valuable				x				worthless	4
uninformed			x					informed	3
avoiding				x				seeking	4
leading			x					following	5
unimportant			x					important	3
timid			x					assertive	3
pleasant						x		unpleasant	2 (43)
superficial		x						profound	2

Appendix E

Well-Being Picture Scale

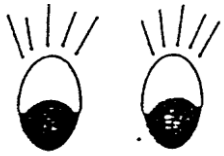
Well-Being Picture Scale Scoring Guide

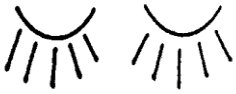
Well-Being Picture Scale

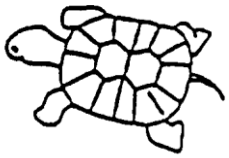
Subject ID _____ **Date of evaluation** _____

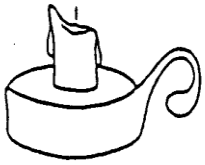
Instructions:

Look at the scale between each pair of pictures. Mark [X] at the place on the scale that best describes how you feel now.

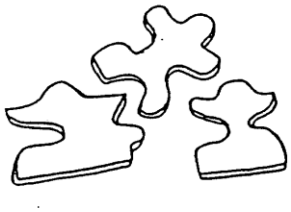


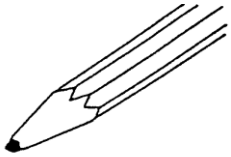


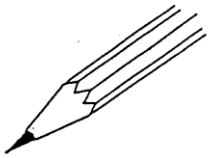


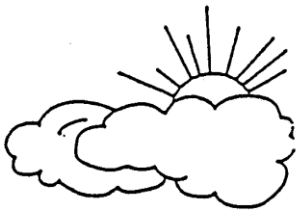


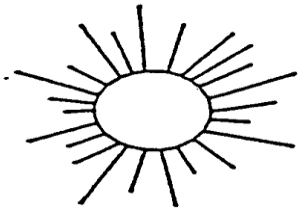
Instructions:
Look at the scale between each pair of pictures. Mark [X] at the place on the scale that best describes how you feel now.

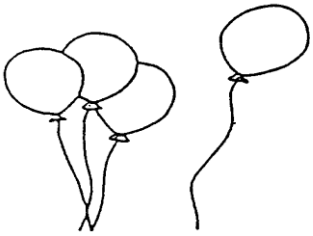


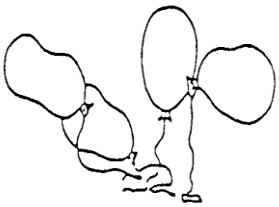


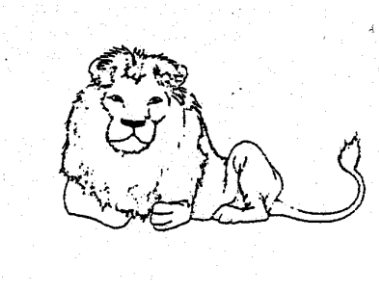










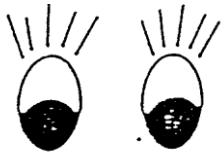


Well-Being Picture Scale

Subject ID _____ Date of evaluation _____

Instructions:

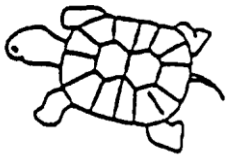
Look at the scale between each pair of pictures. Mark [X] at the place on the scale that best describes how you feel now.

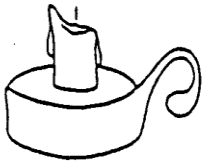


7	6	5	4	3	2	1

1	2	3	4	5	6	7

7	6	5	4	3	2	1



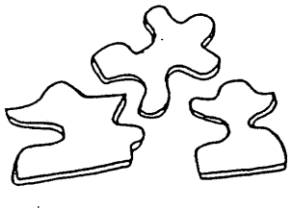


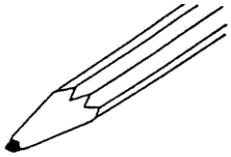
1	2	3	4	5	6	7

7	6	5	4	3	2	1

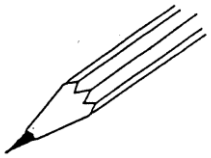
Instructions:
Look at the scale between each pair of pictures. Mark [X] at the place on the scale that best describes how you feel now.

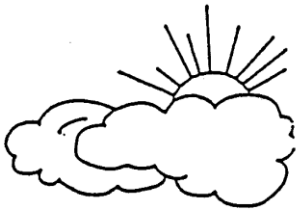
7	6	5	4	3	2	1



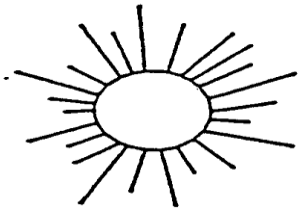


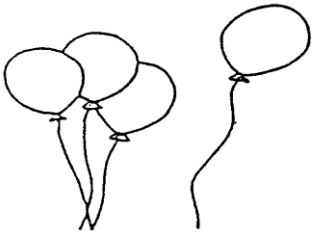
1	2	3	4	5	6	7



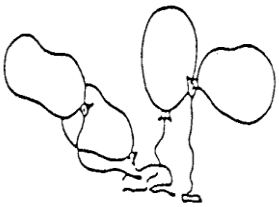


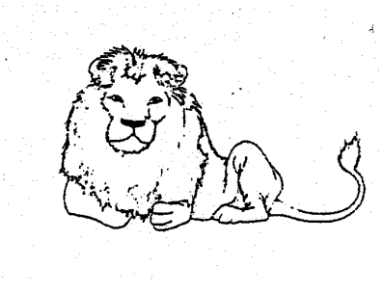
1	2	3	4	5	6	7





7	6	5	4	3	2	1





7	6	5	4	3	2	1

Appendix F

Short Form-12 Version 2 (4-week recall)

Your Health and Well-Being

This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. ***Thank you for completing this survey!***

For each of the following questions, please mark an ☒ in the one box that best describes your answer.

1. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor
☐1	☐2	☐3	☐4	☐5

2. The following questions are about activities you might do during a typical day. Does <u>your health now limit you</u> in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
a <u>Moderate activities</u>, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	☐1	☐2	☐3
b Climbing <u>several</u> flights of stairs	☐1	☐2	☐3

3. During the <u>past 4 weeks</u>, how much of the time have you had any of the following problems with your work or other regular daily activities <u>as a result of your physical health</u>?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a <u>Accomplished less</u> than you would like	☐1	☐2	☐3	☐4	☐5
b Were limited in the <u>kind</u> of work or other activities	☐1	☐2	☐3	☐4	☐5

4. During the <u>past 4 weeks</u>, how much of the time have you had any of the following problems with your work or other regular daily activities <u>as a result of any emotional problems</u> (such as feeling depressed or anxious)?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a <u>Accomplished less</u> than you would like	☐1	☐2	☐3	☐4	☐5
b Did work or other activities <u>less carefully than usual</u>	☐1	☐2	☐3	☐4	☐5

5. During the <u>past 4 weeks</u>, how much did <u>pain</u> interfere with your normal work (including both work outside the home and housework)?

Not at all	A little bit	Moderately	Quite a bit	Extremely
☐1	☐2	☐3	☐4	☐5

6. These questions are about how you feel and how things have been with you <u>during the past 4 weeks</u>. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the <u>past 4 weeks</u>...

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a Have you felt calm and peaceful?	☐1	☐2	☐3	☐4	☐5
b Did you have a lot of energy?	☐1	☐2	☐3	☐4	☐5
c Have you felt downhearted and depressed?	☐1	☐2	☐3	☐4	☐5

7. During the <u>past 4 weeks</u>, how much of the time has your <u>physical health or emotional problems</u> interfered with your social activities (like visiting friends, relatives, etc.)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
☐1	☐2	☐3	☐4	☐5

Thank you for completing these questions!

Appendix G

Yoga Alliance 200 Hour and 500 Hour Standards

200-Hour RYS Standards Category	Minimum Hours Total	 Contact	Notes on Category
1. Techniques Training/Practice—Includes asanas, pranayamas, kriyas, chanting, mantra, meditation, and other traditional yoga techniques. These hours must be a mix between (1) analytical training in how to teach and practice the techniques, and (2) guided practice of the techniques themselves; both areas must receive substantial emphasis.	100	75 (50 with primary E-RYTs*)	Contact hours in this category must be in a dedicated YTT environment (into which others might occasionally be invited) rather than in classes intended for the general public. Although Yoga Alliance honors and respects related disciplines and traditions, both contact and non-contact hours are limited to areas that fall within the scope of traditional yoga studies.
2. Teaching Methodology—Includes principles of demonstration, observation, assisting/correcting, instruction, teaching styles, qualities of a teacher, the student's process of learning, and business aspects of teaching yoga.	25	15 (10 with primary E-RYTs*)	Although your curriculum may include more than 5 hours on business aspects of teaching yoga, a maximum of 5 such hours can be counted.
3. Anatomy & Physiology—Includes both human physical anatomy and physiology (bodily systems, organs, etc.) and energy anatomy and physiology (chakras, nadis, etc.). Includes both the study of the subject and application of its principles to yoga practice (benefits, contraindications, healthy movement patterns, etc).	20	10	A minimum of 5 hours must be spent applying A&P principles to yoga.
4. Yoga Philosophy/Lifestyle and Ethics for Yoga Teachers—Includes the study of yoga philosophies, yoga lifestyle, and ethics for yoga teachers.	30	20	A minimum of 2 contact hours must be spent on ethics for yoga teachers.
5. Practicum—Includes practice teaching, receiving feedback, observing others teaching and hearing/giving feedback. Also includes assisting students while someone else is teaching.	10	5 with primary E-RYTs*	A minimum of 5 contact hours must be spent actively teaching (not assisting or observing others teach).
Remaining Hours *- Hours to be distributed among the categories above according to the school's chosen emphasis (may be contact or non-contact hours).*	15		
Remaining contact hours *required to meet the overall minimum standards; these hours must be distributed among the five numbered categories above, and may be taught by any faculty members.*		55	Total required minimum contact hours for each standards category are indicated in the preceding column. As long as the minimum number of required contact hours in each category is satisfied, the remaining 55 contact hours may be distributed among the five categories as your school chooses.
Total Hours	200	180	

***or equivalent**

500 Hour Standards - effective through December 31, 2007 for both new RYS[SM] 500 applicants and existing RYS[SM] s 500

CATEGORY	REQUIRED HOURS	REQUIRED MINIMUM CONTACT HOURS*	DESCRIPTION
Techniques	150 hours	75 hours	Includes asanas, pranayamas, kriyas, chanting, and meditation. These hours include both training in the techniques and the practice of them.
Teaching Methodology	30 hours	15 hours	Principles of demonstration, observation, assisting/correcting, instruction, teaching styles, qualities of a teacher, and the student's process of learning.
Anatomy and Physiology	35 hours	17.5 hours	Includes both physical Anatomy and Physiology (bodily systems, organs, etc.) and astral/energy/subtle Anatomy and Physiology (chakras, nadis, etc.)
Philosophy/Ethics/Lifestyle	50 hours	25 hours	Study of Yoga Scriptures (Yoga Sutras, Bhagavad Gita, etc.), ethics for yoga teachers, 'living the life of the Yogi', etc.
Practicum	40 hours	20 hours	Includes student teaching as well as observing and assisting in classes taught by others. Hours may be a combination of supervised and unsupervised.
Remaining Hours	185 hours		*Hours to be distributed among the categories above according to the school's chosen emphasis* (may be contact or non-contact hours). These hours do not necessarily represent student electives.
Remaining Contact Hours		197.5 hours	Additional contact hours required to meet the overall minimum standards; *these hours must be distributed among the first five categories above.*
Total Hours	500 hours	at least 350 hours	1 HR. = 60 Minutes *Contact hours means that the Teacher Trainer is physically in the presence of the student. Non-contact or independent study hours may include: assigned reading or other homework, non supervised study groups, observing yoga classes, etc.
Teaching Experience	100 hours		An additional 100 hours of teaching experience, outside of the 500 hours of training, are required before a teacher can enroll in the Registry.

Appendix H

Healthy Moms® Prenatal Yoga Class Format

Healthy Moms® Prenatal Yoga Class Format

a) "Checking In": Women in the prenatal yoga group share any changes they've experienced over the past week and goals for the current session as desired…….....5 minutes

b) "Centering": Visualization and breathing exercises in seated or lying down poses bolstered by pillows to keep the back elevated…….5 minutes

c) "Warm-up": Neck rolls, shoulder exercises, and side stretches in seated position…….10 minutes

d) "Flow": Standing positions which may include a modified sun salutation pose, Kegel exercises, sequence of positions that gradually transition the woman toward the mat for mat exercises……..……..……10 minutes

e) Standing positions: Warrior pose, balancing positions, and wall positions to strengthen the quadriceps and shoulders……5 minutes

f) "Mat Work": Seated positions and hip rotation exercises……10 minutes

g) "Savasana" or "corpse pose": Modified to left side-lying position….10 minutes

h) Meditation……..5 minutes

(Healthy Moms®, 2009).

Appendix I

Healthy Moms® Perinatal Fitness Instructor Training and Certification Course Description

Healthy Moms® Perinatal Fitness Instructor Training and Certification

Course Description

This comprehensive workshop will provide the health or fitness professional with the leadership and technical skills to design, market and implement safe, effective and motivational fitness programs for women just before and during the childbearing year.

Course Objectives (by section)

Upon completion of **Section One (Project Pregnancy: Preconceptual Planning and Care)** the participant will be able to:

1. List the benefits of preconceptual counseling.
2. List the components of preconceptual health care.
3. Cite at least 3 possible factors leading to menstrual dysfunction.
4. Cite the most serious potential risk of exercise during the periconceptual period and suggestions for minimizing this risk.
5. Discuss the importance of folic acid consumption during the periconceptual period as well as food sources of the nutrient.
6. List 2 other nutrients that are important during the periconceptual period as well as their functions and sources.
7. List at least 2 risks of being overweight or obese during pregnancy.

Upon completion of **Section Two (Training for the Main Event: Pregnancy and Exercise)** the participant will be able to:

1. Summarize normal fetal growth and development by trimester.
2. Identify the location and function of certain anatomical structures and organs related to pregnancy and childbirth.
3. Briefly discuss 5 physical changes and symptoms of pregnancy and how these physical changes / symptoms may be alleviated or minimized by exercise as well as their possible effects on an established exercise program.
4. Summarize the psychological changes of pregnancy by trimester and describe ways that the perinatal fitness instructor may help their clients cope with these changes.
5. List 3 routine and 3 special screening tests and procedures that pregnant students may encounter and how undergoing these tests may affect their ability to exercise.
6. Summarize the 4 factors affecting labor length and intensity.
7. Briefly discuss the signs and stages of labor.
8. List 3 benefits of using the Resist-a-Ball® during labor.
9. List 3 possible indications for a cesarean section.
10. List 4 medical interventions and / or testing procedures utilized during labor, delivery or soon after birth.
11. Identify 4 “drug free” methods of pain relief that can be utilized during labor.
12. Identify 4 types of medications available for relaxation and / or pain relief during labor.
13. Briefly discuss the history of perinatal exercise.

14. List 3 goals of a perinatal fitness program.
15. Summarize the physical benefits of maternal exercise.
16. Summarize the psychological benefits of maternal exercise.
17. List 3 physical changes of pregnancy that may alter a woman's self-image.
18. Discuss possible interventions that the perinatal fitness instructor may employ to help women deal with a changing body image.
19. Briefly discuss the importance of screening perinatal clients from a historical, medical, psychological legal and business standpoint.
20. List the absolute contraindications to exercise according to the latest ACOG Guidelines.
21. List the relative contraindications to exercise according to the latest ACOG Guidelines.
22. Describe the contents of an effective screening tool for perinatal clients.
23. Identify warning signs to stop exercise for perinatal clients.
24. Briefly discuss physiological changes of pregnancy with regard to the circulatory, respiratory and musculoskeletal systems and their exercise implications.
25. Briefly discuss thermal adaptations to pregnancy and their exercise implications.
26. Briefly discuss the metabolic and hormonal changes of pregnancy and their exercise implications.
27. Briefly describe 4 anatomical changes of pregnancy and their exercise implications.
28. Define diastasis recti and its exercise implications and demonstrate the procedure used to check a pregnant client for this condition.
29. Demonstrate the "corrective bracing" exercise for separated recti.
30. List 4 benefits of exercising the pelvic floor.
31. Discuss one safe and effective method of teaching your perinatal clients how to locate their kegel muscles.
32. Discuss the benefit of learning how to relax the pelvic floor as well as how to contract it.
33. Briefly discuss modifications of the "traditional" warm-up for pregnant clients.
34. Briefly discuss cardiovascular conditioning modifications for the pregnant client with respect to frequency, intensity, duration and mode.
35. Identify 2 methods of monitoring exercise intensity that may be utilized by pregnant clients.
36. List 2 modifications that pregnant participants may utilize in a step class.
37. Describe and demonstrate exercise modifications appropriate for training the following muscle groups in a pregnant client: Upper, mid and low back, quadriceps, hip AB and AD-ductors, gluteals, hamstrings, abdominal muscles and pelvic floor.
38. Describe the importance of teaching the "coordinated pushing" exercise to your pregnant clients and demonstrate the exercise.
39. Cite 2 important points to remember when designing a cool down for a prenatal fitness class or personal training client.
40. Briefly discuss the benefits of introducing relaxation strategies to pregnant clients early in their pregnancies.
41. Describe and demonstrate "belly breathing" and cite the importance of teaching this technique to your pregnant clients.
42. List 3 benefits of using the Resist-a-Ball® during pregnancy.
43. Identify 4 things that should be emphasized when designing a resistance training program for a pre-conceptual client.
44. List 4 benefits of beginning or continuing a resistance training program prior to or during pregnancy.
45. Compare short lever vs. long lever resistance training exercises for the perinatal client.
46. List 4 "high priority" exercises / stretches that should be included in a perinatal fitness class.
47. Identify 3 "exercise machines" that are not recommended during pregnancy.
48. Describe 2 "hamstring curl" resistance training modifications that a trainer may recommend to a pregnant client.
49. Describe 2 "squat" modifications that a pregnant exerciser may utilize.
50. List 3 physiological advantages that the aquatic exercise environment offers the pregnant client.

51. Briefly describe and a draw a rough diagram of the relationship between fear, tension and pain.
52. Briefly compare and contrast active vs. passive relaxation.
53. Describe 3 methods of active relaxation.
54. Define low glycemic index and high glycemic index carbohydrates and give 2 examples of each.
55. Briefly discuss the importance of a pre-exercise snack for the pregnant exerciser and give 2 examples.
56. Compare the suggested amount of weight gain for pregnant women who are underweight before pregnancy, normal weight before pregnancy, and those who are overweight before pregnancy.
57. Briefly discuss the function in a pregnant woman and give 2 food sources of the following nutrients:
    a. Protein
    b. Iron
    c. Calcium
    d. Folic Acid
58. List 3 suggestions for the relief of heartburn.
59. Briefly discuss why hydration is important for the pregnant exerciser and state the recommended intake per day.

Upon completion of **Section Three (Postpartum: Returning to Your Fitness Goals)** the participant will be able to:

1. Identify the physical and psychological changes of postpartum and how they affect a woman's ability to exercise.
2. Perform an in depth screening on postpartum clients returning to exercise as well as those new to exercise.
3. Identify the three categories of postpartum depression and appropriate intervention strategies.
4. Demonstrate the procedure for checking for diastasis recti on a postpartum client.
5. Demonstrate appropriate "restorative" exercises for the abdominal and pelvic floor muscles, which can be initiated soon after delivery.
6. Identify appropriate progressions for cardiovascular and strength training for the postpartum client.
7. List 3 benefits of using the Resist-a-Ball® during the postpartum period.
8. List 5 "back care" tips that may diminish or alleviate back pain in the postpartum client.
9. Identify basic nutrition guidelines for the postpartum client.
10. Identify specific nutrition concerns / guidelines for the breastfeeding client who is exercising.

Upon completion of **Section Four (The Business Behind Your Perinatal Fitness Program)** the participant will be able to:

1. Describe the "target audience" for a perinatal fitness program.
2. List 2 considerations when choosing a site for your perinatal fitness class.
3. Briefly describe appropriate content that should be included on a perinatal fitness class flyer.

Appendix J

Provider Consent to Participate Form

Provider Consent Form for Prenatal Yoga Participation

Contraindications for Prenatal Exercise*

Absolute Contraindications?	Yes	No	Relative Contraindications?	Yes	No
Does the patient have:			Does the patient have: (These indications must be discussed in depth with caregiver prior to starting any exercise program)		
1. Ruptured membranes or premature labor?			1. History of spontaneous abortion or premature labor?		
2. Persistent second/third trimester bleeding/placenta previa?			2. Mild/moderate cardiovascular or respiratory disease?		
3. Pregnancy induced hypertension, pre-eclampsia or toxemia?			3. Anemia or iron deficiencies? (Hgb < 10 g/dl)?		
4. Incompetent cervix?			4. Very low body fat, eating disorder (anorexia, bulimia)?		
5. Evidence of intrauterine growth restriction?			5. Twin pregnancy after 28th week?		
6. Multiple pregnancy of 3 or more fetuses?			6. Other significant medical condition?		
7. Uncontrolled Diabetes Type I, hypertension or thyroid disease, other serious cardiovascular, respiratory or systemic disease?			Please specify:		
PHYSICAL ACTIVITY/PRENATAL YOGA RECOMMENDATION	**Yes**	**No**	**Comments:**		

*Adapted from ACOG Committee Opinion Number 267, January 2002

I, _____ PLEASE PRINT (Patient's Name), have discussed my plans to participate in a prenatal yoga class during my current pregnancy with my health care provider and I have obtained his/her approval to begin participation.

Signed: _____ Date _____
(Patient's signature)

Name of Provider: _____
Address: _____
_____
Telephone: _____

Provider's Comments: _____
_____
_____

_____
(Provider's Signature)

Appendix K

Study Flyer

Would you be interested in FREE prenatal yoga classes?

Many pregnant women are using yoga as a way to stay healthy during pregnancy.

Volunteers are needed to participate in a 6 week research study of the relationship of yoga practice to health and well-being during pregnancy.

You may qualify for this study if:

- **You are healthy and do not have any pregnancy complications**
- **You are at least 18 years old**
- **You are between 20 to 32 weeks pregnant**

All women who complete 6 weeks of *free* prenatal yoga classes at a yoga studio in Raleigh or Cary and fill out questionnaires before beginning and after completing the classes and complete a brief interview will receive *$25.00 cash* and a *free yoga mat* for participating in the study.

Interested? Want to know more? Contact the study investigator Pamela Reis, CNM, MSN, PhD(c) at 919-866-1262 for more information.