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Mindfulness in Childbirth: An Investigation of the Effects of Mindfulness Training on Maternal Satisfaction with Childbirth and Obstetric Outcomes

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MINDFULNESS IN CHILDBIRTH: AN INVESTIGATION OF THE EFFECTS OF MINDFULNESS TRAINING ON MATERNAL SATISFACTION WITH CHILDBIRTH AND OBSTETRIC OUTCOMES

by

Brenda L. Bratton

A Dissertation
Submitted to the Faculty of The Graduate College in partial fulfillment of the requirements for the Degree of Doctor of Philosophy Department of Psychology Dr. Amy E. Naugle, Advisor

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CHAPTER I

LITERATURE REVIEW

Psychologists in health care settings have traditionally been responsible for developing interventions to help medical patients adapt to a variety of health-related issues and procedures. These interventions have generally included providing treatment for pain relief or symptom relief, helping patients adapt to medical conditions, increasing patients' adherence to medical regimens, and prevention of medical problems (Spiegler & Guevremont, 1998). Recently, researchers have been interested in examining how mindfulness training affects a variety of health-related problems.

Mindfulness

Mindfulness is generally described as a state of being where one develops moment-to-moment awareness and is able to focus on the present situation without becoming caught up in the content of thoughts or feelings associated with the situation (Kabat-Zinn, 1990). A number of psychological interventions, including various contemporary behavioral therapies (i.e., Dialectical Behavior Therapy, Acceptance and Commitment Therapy) have incorporated mindfulness training components into treatment packages, and empirical investigation of the effectiveness of mindfulness-based psychological interventions has emerged (Hayes, Strosahl, & Wilson, 1999; Linehan, 1993). The mindfulness components included in these treatment packages share common features with Mindfulness-Based Stress Reduction (MBSR) developed by Kabat-Zinn
MBSR was developed specifically to teach people to adapt to stress and illness and to search for greater well-being in their lives (Kabat-Zinn, 1990). MBSR emerged out of the philosophical teachings of eastern religions and holistic approaches to physical well-being with an emphasis on mindfulness meditation. Specifically, mindfulness is at the center of Buddhist meditation and has been practiced for over 2,500 years (Kabat-Zinn, 1990). Although mindfulness meditation is rooted in eastern religions, the skill of being mindful is universal (Kabat-Zinn, 1990) and is merely one way a person can pay attention to their experiences, both internally and externally. MBSR focuses on teaching individuals to learn how to respond to situations in contrast to reacting to them; that is, to be “mindful.” Within a framework of nonjudgment and acceptance, MBSR uses meditation and focused breathing to allow one to arrive at a state of relaxation and observant detachment.

Over the years, numerous studies have examined the effects of MBSR on a variety of health-related issues, including stress (Astin, 1997; Marcus et al., 2003), chronic pain (Kabat-Zinn, 1982; Kabat-Zinn, Lipworth, & Burney, 1985), headaches (Sun, Kuo, & Chiu, 2002), fibromyalgia (Kaplan, Goldenberg, & Galvin-Nadeau, 1993; Weissbecker et al., 2002), and health-related quality of life (Reibel, Greeson, Brainard, & Rosenzweig, 2001; Williams, Kolar, Reger, & Pearson, 2001). Researchers have also examined the psychological effects of MBSR on affective symptoms (Kabat-Zinn et al., 1992; Miller, Fletcher, & Kabat-Zinn, 1995; Ramel, Goldin, Carmona, & McQuaid, 2004) as well as the interaction between emotional and health-related problems, such as heart disease (Tacon, McComb, Caldera, & Randolph, 2003), breast cancer (Carlson, Speca, Patel, & Goodey, 2004; Speca, Carlson, Goodey, & Angen, 2000; Tacon, Caldera, & Ronaghan,
2004), prostate cancer (Carlson et al., 2004), and pain (Chang et al., 2004). Generally, results have been positive indicating a reduction in both physical and affective symptoms and ruminations, reduction in medication use for pain, and improved quality of life. Furthermore, follow-up investigations of MBSR support the longevity of these results. Grossman, Niemann, Schmidt, and Walach (2004) performed a meta-analysis of empirical health-related studies using MBSR. They found that MBSR appears to produce consistently strong results across conditions and sample types with improved coping abilities for individuals in everyday life and under extreme forms of stress. Given the promising effects of MBSR for various health problems, it seems logical to expand the intervention to other areas of health-related concerns and explore the effectiveness on MBSR in these new areas. One such area that warrants application and investigation of MBSR is as an approach to helping expectant mothers prepare for childbirth.

Experiences of Labor and Childbirth

Stages of Labor

Childbirth is divided into four stages with the first stage composed of three phases (McKinney, James, Murray, & Ashwill, 2005). Stage one of childbirth consists of the cervix effacing and dilating. The first phase of labor is the latent or early phase consisting of the cervix thinning and dilating to 3 centimeters. Typically, it is the longest phase and the least intense. The active phase follows with cervix dilation to 7 centimeters. As expected, contractions often become more intense and more frequent. Finally, the third or transition phase occurs up to full dilation (10 centimeters) of the cervix and is typically a
short, but highly intense phase. The second stage of childbirth consists of delivering the baby, with nullipara women taking an average of 30 minutes longer to deliver than multipara women. The third stage of childbirth is the delivery of the placenta, and the fourth and final stage is the initial recovery and maternal attachment. Although women are often eager for the arrival of their child, a variety of intrapartum complications can occur during any one of these stages, resulting in a negative childbirth experience. Researchers have documented several factors associated with a higher likelihood of experiencing problems.

**Fear and Anxiety**

Research has shown that a large percentage of women report a fear of childbirth, with estimates ranging up to 20% (Areskog, Uddenberg, & Kjessler, 1981) to 58% (Geissbuehler & Eberhard, 2002). Fear and anxiety can occur for a variety of reasons, including fear of pain, complications, death, and the child’s well-being. Although primiparous women generally report more fear or anxiety over childbirth compared to multiparous women (Alehagen, Wijma, & Wijma, 2001; Geissbuehler & Eberhard, 2002), fear or anxiety may increase one’s risk for experiencing a negative childbirth.

Numerous studies have examined the relationship between anxiety and its effects on childbirth, and it appears that fear of childbirth is related to a variety of complications. For instance, women reporting a fear of childbirth were more likely to have longer durations of labor (Crandon, 1979; Saisto, Ylikorkala, & Halmesmaki, 1999), more severe perineal lacerations (Saisto et al., 1999) and more frequent postpartum complications (Saisto et al., 1999) compared to women without such a fear. Ryding,
Wijma, Wijma, and Rydhstrom (1998) suggest that intrapartum complications may be related to anxiety as they found a relationship between anxiety and both uterine dysfunction and poor performance during labor. Sjogren and Thomassen (1997) provide additional support and report that all of the women in their study who received an emergency cesarean section had initially requested an elective cesarean section due to fear of childbirth. The researchers questioned whether anxiety may have complicated labor as several of these women's medical records had anxiety indicated as a factor contributing to the emergency cesarean.

Johnson and Slade (2003) provide a review of literature on the relationship between anxiety and labor and delivery complications. They note that although there are methodological problems with some of these studies, support exists for a relationship between specific types of anxiety, such as fear of childbirth, and intrapartum complications of longer labor duration and cesarean section deliveries. It is likely that women who have a fear of childbirth may be highly anxious during labor and delivery which may lead to longer labors, failure to progress, and ultimately fetal distress. Ryding, Wijma, Wijma, and Rydhstrom (1998) suggest that as labor fails to progress, the fetus may become distressed resulting in an emergency cesarean section. Several researchers have supported this relationship between fear of childbirth and higher likelihood of having either an elective (Gamble & Creedy, 2001; Sjogren & Thomassen, 1997; Wiklund, Edman, Ryding, & Andolf, 2008) or emergency cesarean section (Areskog, Uddenberg, & Kjessler, 1983; Ryding, Wijma, Wijma, & Rydhstrom, 1998; Sjogren & Thomassen, 1997).
Anxiety or fear of childbirth also appears to be related to higher medication use (Alehagen et al., 2001; Areskog et al., 1983; Sjogren & Thomassen, 1997). Heinze and Sleigh (2003) and Sjogren and Thomassen (1997) found that women with fear of childbirth were more likely to have epidural analgesia during labor, and the majority of these women decided to have an epidural before labor began, indicating that concern about pain was a deciding factor (Heinze & Sleigh, 2003). Additionally, Sjogren and Thomassen (1997) reported that women fearing childbirth were more likely to be induced and have oxytocin administered, which was associated with having an epidural and more operative deliveries (Svardby, Nordstrom, & Sellstrom, 2007), and oxytocin produces more frequent, intense contractions that have a longer duration along with risk factors for both mother and fetus (McKinney et al., 2005).

Pain

Pain is another factor related to labor and delivery complications. It is not surprising that women who experience more pain during labor often use more pain medication (Reading & Cox, 1985). Kannan, Jamison, and Datta (2001) found that women who received an epidural had higher pain scores during the latent phase of labor compared to women who did not have epidural analgesia. Although pain is a common experience of childbirth, Brownridge (1995) stated that suffering is not. He added that in addition to pain, suffering is influenced by factors such as anxiety and fear. Therefore, the more fear or anxiety a person experiences when in pain, the higher the likelihood of experiencing suffering.
Areskog and colleagues (1983) found that women reporting fear of childbirth were more likely to experience pain and anxiety during delivery. Alehagen and colleagues (2001) report that fear and pain may have a bidirectional relationship such that as a person becomes fearful, they may be more likely to have an increase in pain which further increases their fear. Lang, Sorrell, Rodgers, and Lebeck (2006) added that anxiety sensitivity and poor coping strategies may further increase pain as well as beliefs that the pain is either threatening or harmful. Lowe (1996) supports this theory, and Brownridge (1995) suggests that anxiety and stress are often secondary to labor pain, such that one's reaction to pain can lead to a variety of negative consequences, such as hyperventilation, nausea, fatigue, and disorientation.

As such, many women choose some type of pain relief during labor. Nonpharmacologic pain management methods are pain relief alternatives to medication and include relaxation and breathing techniques, massage, and hydrotherapy, to name a few. Women may also choose pharmacologic pain management. Systemic drugs affect the entire body; regional pain control techniques affect only part of the body without loss of consciousness, and general anesthesia results in loss of consciousness (McKinney et al., 2005).

Medical and Pharmacologic Interventions in Labor and Delivery

As noted above, women with high levels of fear or anxiety and high levels of pain are more likely to request pain relief. There are a variety of possible side effects noted for the mother and neonate, depending on which medication is administered and at what phase or stage in labor (McKinney et al., 2005). However, epidurals seem to be selected
with a high frequency for women who experience high levels of fear, anxiety, or pain. Although an epidural can be quite effective in relieving labor pain (Kannan et al., 2001), women who receive an epidural report being less satisfied with their childbirth experience compared to women who do not.

**Epidural use and side effects.** Epidurals are related to a variety of intrapartum complications, including longer labor durations (Kannan et al., 2001; Leeman, Fontaine, King, Klein, & Ratcliffe, 2003), greater likelihood of having an instrumental vaginal delivery (Leighton & Halpern, 2002; Walker & O’Brien, 1999), increased chance of having a cesarean section delivery (Walker & O’Brien, 1999), longer second stage of labor (Leighton & Halpern, 2002; McKinney et al., 2005; Walker & O’Brien, 1999), and use of oxytocin following epidural (Leighton & Halpern, 2002; Walker & O’Brien, 1999). Possible maternal effects include an increased risk of developing a fever (Leighton & Halpern, 2002; McKinney et al., 2005), increased risk of third and fourth degree perineal lacerations (Amis & Green, 2003), and low blood pressure (McKinney et al., 2005). Possible fetal effects include drop in fetal heart rate and septic workup if the mother develops a fever (McKinney et al., 2005) and babies with lower Apgar scores (Walker & O’Brien, 1999). Interestingly, Heinze and Sleigh (2003) reported that women who chose not to have an epidural pre-labor were more knowledgeable about its side effects compared to women who decided pre-labor to have an epidural.

**Medical interventions and complications.** Medical interventions can include an episiotomy, instrumental (operative) vaginal delivery with either forceps or vacuum extraction, and cesarean section delivery. Generally, women who experience medical interventions are at a greater risk for complications. Regarding instrumental vaginal
deliveries, women may be at a greater risk for rehospitalization for postpartum hemorrhaging, complications with surgical wounds, and pelvic injuries (Lydon-Rochelle, Holt, Martin, & Easterling, 2000).

Similar concerns have been noted for cesarean deliveries. It seems that there could be a chain of events that follow fear of childbirth leading to a cesarean section. As stated previously, women who have a high fear of childbirth are more likely to have longer labor, which is associated with an increased likelihood of delivery via cesarean section (Waldenstrom, 1999). Women who fear childbirth may experience more pain and may be more likely to request epidural medication, which also is associated with an increased likelihood of cesarean section delivery. Finally, women with a fear of childbirth also may elect to have a cesarean section delivery. Research has documented a variety of risks related to cesarean section deliveries, including a higher likelihood of rehospitalization for uterine infections, complications with the surgical wound, cardiopulmonary problems, and thromboembolisms (Lydon-Rochelle et al., 2000; McKinney et al., 2005). There are risks for the fetus as well, such as premature birth, respiratory and cardiopulmonary problems, and injuries of bruises, fractures, or lacerations (McKinney et al., 2005). Furthermore, women who have an emergency cesarean section when dilated at 9 to 10 centimeters more than double their risk of experiencing complications compared to women who have a cesarean section at 0 cm (Moore, 2004). Therefore, it would seem that women who undergo emergency cesarean deliveries are at the highest risk, although women may not be fully aware of what these risks are. Similar to knowledge of epidural side effects, Gamble and Creedy (2001) reported that of women who requested a cesarean section, only 40% were aware of risks for themselves and only 5% were aware of any
risks for their babies. This cascade of effects may ultimately lead to dissatisfaction with the childbirth experience.

Satisfaction With Childbirth Experience

Numerous studies have documented factors that may result in a negative childbirth experience, including having an epidural (Heinze & Sleigh, 2003; Kannon et al., 2001; Waldenstrom, Hildingsson, Rubertsson, & Radestad, 2004), induction of labor (Waldenstrom, 1999; Waldenstrom et al., 2004), augmentation of labor (Sadler, Davison, & McCowan, 2001; Svardby et al., 2007; Waldenstrom, 1999; Waldenstrom et al., 2004), having a perception of lacking control or involvement in the childbirth process (Soet, Brack, & Dilorio, 2003; Waldenstrom, 1999; Waldenstrom et al., 2004), having a cesarean section (Bradley, Ross, & Warnyca, 1983; Dimatteo et al., 1996; Ryding, Wijma, & Wijma, 1998; Saisto, Salmela-Aro, Nurmi, & Halmesmaki, 2001; Soet et al., 2003; Waldenstrom, 1999; Waldenstrom, 2004; Waldenstrom et al., 2004;Wiklund et al., 2008), having an instrumental vaginal delivery (Maclean, McDermott, & May, 2000; Ryding, Wijma, & Wijma, 1998; Waldenstrom, 1999; Waldenstrom et al., 2004; Wiklund et al., 2008), having an episiotomy (Maclean et al., 2000), having numerous medical interventions (Soet et al., 2003; Waldenstrom, 1999), having a longer labor (Sadler et al., 2001; Soet et al., 2003; Waldenstrom et al., 2004), experiencing severe labor pain (Areskog et al., 1983; Sadler et al., 2001; Saisto et al., 2001; Soet et al., 2003; Waldenstrom, 1999; Waldenstrom, 2004; Waldenstrom et al., 2004), having high anxiety before delivery (Areskog et al., 1983; Saisto et al., 2001; Soet et al., 2003; Waldenstrom,
2004) having high anxiety during delivery (Waldenstrom, 1999), and having an unhealthy baby (Waldenstrom, 1999).

**Consequences of a Negative Childbirth Experience**

It seems that women's fear of childbirth may be at its highest level postpartum (Arizmendi & Affonso, 1987) with women reporting stress related to memories of difficult labors. These negative experiences can have adverse effects for subsequent deliveries. For instance, women who have had a previously negative birthing experience were more likely to prefer a cesarean section for subsequent pregnancies (Abitbol et al., 1993; Gamble & Creedy, 2001; Ryding, 1993; Sjogren & Thomassen, 1997). Additionally, women who experienced one negative birth experience may be at risk for subsequent deliveries to be negative (Waldenstrom et al., 2004). Saisto and colleagues (1999) reported that women with fear of delivery during second pregnancies were more likely to have experienced either an emergency cesarean section or a vacuum extraction during their first delivery than women without fear of delivery during second pregnancies. For the majority of these women, these medical procedures occurred due to failed progress of labor.

Negative childbirth experiences have far-reaching consequences, including a possible diminished likelihood of future deliveries (Areskog et al., 1983). Therefore, it is important to equip women, as best as possible, with skills for coping with labor and delivery. Childbirth preparation classes attempt to do this.
Childbirth Preparation Classes

Although women are not able to control all aspects of labor and delivery, childbirth preparation classes can provide them with education and strategies to cope more adaptively with anxiety, pain, and complications. These classes can range from single day sessions to sessions that occur over several weeks. Some classes are mainly didactic whereas others include many opportunities to practice coping strategies both within and between sessions.

Women attend these classes for a variety of reasons; however, fear of childbirth may be at the top of the list (Geissbuehler & Eberhard, 2002). Researchers have examined the utility of childbirth preparation classes for maternal satisfaction with childbirth and obstetric outcomes, and results are varied. It appears that women who receive more intensive training, such as Lamaze classes, might be better equipped to utilize these coping strategies during labor. Hughey, McElin, Facog, and Young (1978) found that women with Lamaze training had more spontaneous deliveries, fewer cesarean sections, less fetal distress, and fewer complications, including perineal lacerations and postpartum infections. Heinze and Sleigh (2003) also found positive effects of Lamaze training. Women trained in Lamaze were less likely to have had an epidural, had more knowledge about the side effects of epidural use, and were less likely to fear childbirth. Also, Delke, Minkoff, and Grunebaum (1985) found that women who were trained in Lamaze had significantly shorter stage one labor and a trend was found for these women to request fewer analgesics. Furthermore, Bennett, Hewson, Booker, and Holliday (1985) reported
that amount of time spent in childbirth class was related to medication usage, with higher class attendance related to lower medication use.

Although these results appear promising, Spiby, Slade, Escott, Henderson, and Fraser (2003) stated that few studies have examined the effectiveness of childbirth coping strategies, and of the studies that have researched this topic, women’s expectations of the effects of coping strategies have differed from their actual experiences in using these strategies. This includes both breathing and relaxation exercises and control over birthing positions. Some researchers have suggested that women may fail to use these strategies during labor, or they may not use them appropriately. Copstick, Hayes, Taylor, and Morris (1985) reported that as labor progresses, women’s use of coping strategies often decrease. It may be easier to use these strategies when labor is less intense. However, as the frequency and intensity of contractions increase, women may become more distracted and less focused. Additionally, medical procedures may interfere with the ability to successfully use coping strategies. Spiby and colleagues (2003) found that although women often tried to use various coping strategies during labor, they were disrupted due to both routine care and administration of medication. Furthermore, women indicated that these strategies often had little to no effect in coping with childbirth, particularly relaxation strategies. Mackey (1995) found that as women’s ability to effectively perform Lamaze techniques diminished, their feelings of losing control increased. Many women who were categorized as having either difficulty with childbirth or managing poorly with childbirth reported that they struggled using one or more of the Lamaze techniques.

Doering and Entwisle (1975) suggest that women who are better prepared for childbirth will have a heightened awareness, helping them more successfully cope with
the experience. Therefore, as women become less effective in executing these skills during labor, they may become more distracted, less focused, and more reactive to the situation. Da Costa, Larouche, and Brender (2000) found that women who used distractive coping were more likely to have labor complications. It seems that both preparation for labor and ability to effectively execute coping strategies during labor may lead to more positive childbirth experiences. For less prepared women, pain and anxiety may increase as labor progresses and the woman becomes less effective in using these strategies. She may begin to rely on more distraction techniques, and this may lead to complications, such as increased muscle tension, prolonged labor, ineffective pushing, and the need for a variety of medical interventions. Therefore, it seems that helping women to become more aware of the labor process as it is occurring may allow them to more effectively use coping strategies and may help them adapt better to unforeseen problems, all of which would result in a more positive birthing experience.

Mindfulness and Childbirth Preparation

In the last several years, two programs (one on the east coast and one on the west coast) have begun to incorporate mindfulness training into childbirth preparation courses (Raisler, 1999). Although no objective data have been collected on the effectiveness of these programs, anecdotal data from patients indicate that the training is helpful in allowing women to focus well and relax during labor, which often results in positive birthing experiences. Additionally, midwives are often able to identify women who have received mindfulness training and report that these women appear to cope better during labor, have more confidence, less fear, better communication with their birthing partner,
fewer preterm births, and fewer babies with low birth weight. Although there may be other factors that influence these reports, such as a healthy diet or participation in a childbirth preparation class, it is possible that mindfulness training allows women to be more involved in their labor so that they can respond to the situation as opposed to simply reacting to it. Although the instructors of these programs report that women are taught to not be too attached to any particular birthing process and to work with their experience moment-to-moment, they state that the paradox is that when they do this, they often have a positive birthing experience. The women are taught to respond to their situation rather than react to it, which seems to help them develop greater patience and calmness. They are taught to take their birthing experience "one breath at a time."

Although no studies currently exist examining the effects of mindfulness on childbirth, Nestler and Dovey (2001) report that a doctoral dissertation study conducted by Heidelberg found positive benefits of transcendental meditation on childbirth. Specifically, they reported that women experienced less anxiety and pain, shorter labor duration, and a lower use of instrumental deliveries and cesarean sections. Two other studies provide support for the use of transcendental meditation with pregnant women combining it with an integrated approach of yoga therapy (IAYT) that included deep relaxation, slow and controlled breathing, and focused breathing and/or transcendental meditation (Narendran, Nagarathna, Gunasheela, & Nagendra, 2005; Narendran, Nagarathna, Narendran, Gunasheela, & Nagendra, 2005). Narendran, Nagarathna, Narendran, and colleagues (2005) found significantly fewer low birth weights, intrauterine growth restriction, preterm delivery, and pregnancy induced hypertension compared to the control group which was instructed to walk twice daily. There was also a
lower incidence of emergency cesarean sections in the treatment group compared to controls, yet this difference was nonsignificant. Narendran, Nagarathna, Gunasheela, and Nagendra (2005) replicated this study with a group of women having Doppler abnormalities. Again, they found significantly fewer low birth weights in the treatment group compared to controls, yet all other results were nonsignificant. However, there was a trend favoring lower complications in the treatment group.

Although transcendental meditation differs from mindfulness meditation regarding the object of focus for one’s attention, mindfulness training for childbirth may produce similar results. Valentine and Sweet (1999) compared short-term (i.e., 24 months or less) and long-term meditators of both concentrative meditation and mindfulness meditation on sustained attention. Generally, both groups had significantly better concentration and sustained attention compared to a control group, and long-term meditators also significantly outperformed short-term meditators. However, when the stimulus was unexpected, the mindfulness meditators outperformed the concentrative meditators, suggesting that mindfulness meditators are less susceptible to getting “caught up” with a stimulus as they do not allow any one particular stimulus to be salient. The latter part of this study is promising as pregnant women would need to shift their attention and focus numerous times.

Current Study

This study investigated the effects of mindfulness training on obstetric outcomes and maternal satisfaction with childbirth. Specifically, we were interested in whether mindfulness training (MF) was more effective than a control group receiving
psychoeducation on stress/anxiety reduction (SM). Prior research has supported the use of psychoeducation and stress/anxiety-management techniques for decreasing one's level of stress and anxiety for pregnant women in general (Bastani, Hidarnia, Kazemnejad, Vafaei, & Kashanian, 2005), and specifically with childbirth outcomes (Bastani, Hidarnia, Montgomery, Aguilar-Vafaei, & Kazemnejad, 2006). See Beddoe and Lee (2008) for a review of mind-body interventions used during pregnancy. The goal of the MF group was to increase participants' moment-to-moment awareness of thoughts, feelings, and body sensations during childbirth so that they would respond to these experiences rather than react to them in an automatic manner based on habit, negative thoughts, or emotions. Mindfulness training was adapted from the Mindfulness-Based Stress Reduction (MBSR) model developed by Kabat-Zinn, focusing on meditations and body scan. These techniques aim to increase awareness of moment-to-moment experiences, including body sensations, while detaching oneself from thoughts and feelings associated with those experiences. These strategies were hypothesized to help a laboring woman minimize any fear or anxiety associated with pain and complications and be more adaptive to whatever circumstances arise. Hatha yoga was not included in this study, as its focus has been to improve the musculoskeletal system due to disuse atrophy, and it has not traditionally been used as a mindfulness technique (Kabat-Zinn, 1982). Additionally, in previous studies, participants unable to practice yoga simply practiced the meditation techniques (Kabat-Zinn & Chapman-Waldrop, 1988).

Two groups of pregnant women were recruited. The control group received a one-session (~ 3 hours) training focused on teaching stress-management techniques. The intervention group received a four-week course in mindfulness training that included both
in- and between-session mindfulness practices along with opportunities to discuss any potential problems that occurred while practicing throughout the week. Both groups were reminded of the importance of practice for learning these skills, yet the MF group was encouraged to practice mindfulness daily for a minimum of 45 minutes until at least childbirth.

**Hypotheses**

The research question proposed by this study was: Does mindfulness training produce more desirable childbirth experiences and obstetric outcomes than stress-management training? This study investigated the overall effectiveness of these two training programs on obstetric outcomes and maternal satisfaction with childbirth by the following hypotheses.

**Hypothesis 1:** It was hypothesized that all participants would demonstrate an increase in mindfulness skills from pre- to posttreatment. Moreover, participants in the MF condition would report higher mindfulness scores posttreatment and postpartum compared to participants in the SM condition. This outcome was measured by the KIMS assessed at pretreatment, posttreatment, and postpartum.

**Hypothesis 2:** It was hypothesized that participants in the MF condition would have fewer obstetric complications, lower medication use, lower fear of childbirth, less anxiety, and higher maternal satisfaction of childbirth compared to participants in the SM condition. These outcomes were measured by the Labor and Delivery Assessment form, the W-DEQ, the STAI, and the Kyman Maternal Satisfaction Questionnaire.
Hypothesis 3: It was hypothesized that participants who reported more time spent practicing mindfulness would have fewer obstetric complications, lower medication use, lower fear of childbirth, less anxiety, and higher maternal satisfaction of childbirth. This was measured by participants’ weekly meditation practice log, the Post-treatment Mindfulness Practice Assessment form, the Labor and Delivery Assessment form, the W-DEQ, the STAI, and the Kyman Maternal Satisfaction Questionnaire.
A total of 25 pregnant females over the age of 18 were recruited for participation in this study. Twenty participants completed the study with an equal number of participants in each condition. All five of the noncompleters were from the MF condition. Two participants discontinued participation after session one, with one discontinuing due to an ill grandfather and another discontinuing due to anxiety regarding videotaped sessions. A third participant dropped out of the study after session two and did not provide a reason for discontinuing the study. It is possible that this participant had a miscarriage as she reported having already miscarried one of her twins and was having some ongoing spotting with the remaining twin. The fourth participant dropped out of the study posttreatment and did not complete postpartum assessment measures. Although she did not return the withdrawal from the study form, she could not be reached via telephone and did not return postpartum assessment measures mailed to her. Finally, one participant had not given birth at the time of these analyses.

One important factor in the drop out rates was that participants in the SM group had less of an opportunity to drop out of the study during training compared to the MF group. All participants completed their first or only session immediately following the pretreatment phase. Therefore, it is less likely that participants in the SM group would
have discontinued participating in the study during the training phase as they would have had to do so either immediately following the pretreatment phase or during the one-session treatment session.

Data were compared for study completers and noncompleters to determine whether any significant pretreatment differences existed that may have contributed to a participant choosing to discontinue participation in this study. There were no significant differences found on any of the dependent measures, and the average age of noncompleters ($M = 31.00, SD = 2.65$, range: 27 to 34) was similar to completers.

Of the remaining 20 participants, the average age was 29.00 years ($SD = 5.61$, range: 19 to 42). The majority of participants were Caucasian (90%; $n = 18$), with Asian/Pacific Islander (5%; $n = 1$), and Other (5%; $n = 1$) comprising the remaining sample. Sixty percent ($n = 12$) of participants had a midwife for their obstetric provider, 35% ($n = 7$) had an obstetrician, and 5% ($n = 1$) had a family physician/general practitioner. Thirty percent of the sample ($n = 6$) had given birth previously, with one of these participants having given birth three times. Although all of the participants were required to take a childbirth preparation class prior to delivery, the number of classes taken varied. Most participants completed one childbirth class (60%; $n = 12$), 25% ($n = 5$) completed two classes, 10% ($n = 2$) completed four classes, and 5% ($n = 1$) completed nine classes. Numbers of hours in class also varied greatly with 1-5 hours (10%; $n = 2$), 6-10 hours (45%; $n = 9$), 11-15 hours (10%; $n = 2$), 16-20 hours (10%; $n = 2$), 21-25 hours (15%; $n = 3$), and over 25 hours (10%; $n = 2$). All participants volunteered for the study and had a chance of winning one of two $50$ gift cards to a local store.
Recruitment

Participants were recruited through obstetrician/midwifery clinics, childbirth preparation classes, community stores, massage clinics, baby expos, childcare centers, churches, fliers posted around the community, and ads in the local newspaper (see Appendix A for newspaper ad). Recruitment flyers that briefly described the study were posted around campus and at other locations throughout the surrounding Kalamazoo and Grand Rapids communities (see Appendix B) and brochures describing the study were handed out in obstetrician/midwifery clinics, childbirth preparation classes, community stores, massage clinics, childcare centers, churches, and baby expos (see Appendix C). This information highlighted that the proposed training was not a replacement for childbirth preparation classes but an adjunctive option for learning a new coping skill to be used in conjunction with the skills taught in childbirth preparation classes. Women interested in learning more about participating in the study were encouraged to contact the student investigator via telephone or e-mail (see Appendix D for contact script) and had an opportunity to discuss the nature of the study and address any questions or concerns that they had. They were invited to participate in this study only if they had taken or intended to take a childbirth preparation class. See Appendix E for inclusion/exclusion criteria checklist. For multiparous women, women were excluded from this study if they had never taken a childbirth preparation class and did not intend to take a childbirth class during this pregnancy. Additionally, participants were excluded from the study if they were unable to commit to participating in either of the two conditions. During this initial contact, the student investigator invited potential
participants to attend an individual pretreatment session. Participants’ preferred method of contact was recorded on a master contact list (see Appendix F).

Pretreatment Assessment

The initial meeting occurred with the student investigator or graduate student trainer in a therapy room at one of three locations: the Unified Clinics of Kalamazoo, a research/therapy room at WMU, or a therapy office in Grand Rapids. During the initial meeting, the study was explained in further detail and informed consent was obtained (Appendix G). If women were eligible and elected to participate, they were asked to complete a meditation practices assessment form, demographic form, a childbirth preparation class assessment form, the Wijma Delivery Expectancy/Experience Questionnaire, Version A (W-DEQ; Wijma, Wijma, & Zar, 1998), the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), and the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004; see Appendix H for assessment measures developed for this study and a flow chart summarizing these procedures). Participants who had not completed their childbirth preparation class prior to this session were asked to complete the childbirth preparation class assessment form postpartum. This form was mailed out postpartum along with the other postpartum assessment measures. Next, participants were quasi-randomly assigned to either the control condition or the mindfulness/intervention condition with participants stratified to each condition based on the extent of their meditative practices (see Appendix H for Meditation Practices Assessment form). This quasi-random assignment strategy was selected in order to reduce potential attrition that might occur as a result of
time factors (i.e., women delivering during the wait period that would likely occur if true random assignment were used). Stratification also was used to help control for any influence that prior meditative practice may exert. A coin toss determined whether the first participant received the one-session SM or the MF. Subsequent participant assignment was determined by stratification and a coin toss. Following assignment to condition, the participant then proceeded with either Session 1 if assigned to the MF condition or to the one-session SM program if assigned to the control condition. Each participant provided the student investigator with contact information, and participants assigned to the MF condition selected a consistent meeting time for the subsequent three sessions. Participants in the MF condition were given a reminder phone call or e-mail message one or two days prior to the next session, including information about the date, time, and location of the session.

**Treatment Sessions**

All sessions were conducted individually and were either videotaped or audiotaped to be coded later for treatment adherence. Dates and times for participation varied. All sessions were conducted in either a therapy room at the Unified Clinics in Kalamazoo, a therapy room in Wood Hall Suite 2500, or a therapy room at Pine Rest SW clinic in Grand Rapids. Either the student investigator or a research assistant (RA) conducted each session. See Appendix I for an outline of each session. The following format was followed for the different conditions:
One-Session Stress Management Condition

Following the informed consent process and completion of pretreatment assessment measures, the researcher or trainer provided an overview of the stress-management (SM) session and described what the participant may expect. This condition was primarily psychoeducational in nature and lasted approximately 90 minutes. The format and content of this session was a typical anxiety-management program and was modified from the following sources: Andrews, Creamer, Crino, Hunt, Lampe, and Page (2003); and Leahy and Holland (2000). Participants were provided with information regarding common reactions to stressful situations and were offered strategies for minimizing the impact of stress. For example, participants were provided with an explanation about anxiety/stress, including the biological, cognitive, and behavioral components, benefits of anxiety, consequences of high levels of anxiety, and factors that can influence the experience of anxiety. Participants were given instruction about breathing and relaxation techniques which are commonly used behavioral techniques for addressing stress and anxiety. A discussion followed to clarify any misconceptions or questions the participant may have had. Then, the participant was instructed on breathing and its relationship to anxiety, specifically focusing on hyperventilation and techniques to control/prevent hyperventilation. Specific breathing exercises were introduced and briefly practiced, such as diaphragmatic breathing, rebreathing, holding the breath, rhythmic breathing, and counting breaths. Discussion and clarification of issues were woven into both the didactic and experiential activities. Following breathing training, the participant was introduced to relaxation, including why relaxation may be beneficial, variations of
relaxation training (i.e., differences in the number of muscle groups involved, release-only relaxation, cue-controlled relaxation), and the participant practiced progressive-muscle relaxation in-session.

There was a brief discussion regarding how to incorporate these activities into childbirth, and the participant was informed about the importance of practice for learning these skills. She was asked to complete the KIMS to assess for changes in awareness following training and was asked to complete the postprogram evaluation form version B (see Appendix H) to assess for her perceptions regarding the usefulness of the information learned. Finally, the participant was provided with two business cards that had the student investigator's telephone number. She was asked to contact the researcher following childbirth while still in the hospital. She was informed that the purpose for this was twofold: to allow her an opportunity to discuss the birthing experience with the trainer for her session and to complete postpartum assessment measures. The participant was reminded that if she wished to withdraw from this study at any point, she simply needed to sign and return the withdrawal of consent form which was mailed to her one week prior to her estimated due date. If this form was not received one week following her estimated due date and the participant had not contacted the researcher, the participant was reminded that the researcher would attempt to contact her.

Four-Week Mindfulness Condition

Session 1 (approximately 90 minutes). Following completion of the informed consent process and pretreatment assessment, the researcher or trainer provided an overview of the mindfulness (MF) intervention and explained what the participant could
expect in session one and across the next several weeks. Mindfulness was explained, including how to achieve mindfulness, and a brief review of related studies was described. Next, the researcher provided an overview of the attitudinal factors related to mindfulness. A brief mindfulness activity followed. Then the concept of mindfulness of breathing was introduced and practiced for 3 minutes followed by a discussion of the participant’s experiences. We also discussed why mindfulness of breathing is important and how to practice mindfulness of breathing. The participant was introduced to the body scan technique and engaged in a brief body scan followed by a discussion of the participant’s experiences. The session ended with a discussion of homework to be done between sessions and why practicing is important. Homework consisted of daily practices of sitting with the breath, informally practicing mindfulness of breathing, informally practicing mindfulness in daily life, and daily practice of full body scans. The participant was also introduced to the meditation log (see Appendix H) and was asked to record daily the frequency and duration of her practices. She also was provided with a guided meditation tape and asked to use this tape while practicing for at least the first week. Afterwards, she could choose whether she wanted to use the tape to help her practice these meditation exercises. We ended the session with a mindfulness activity. The participant was advised that she could stop the mediation exercises anytime if she became extremely anxious or uncomfortable during practice. The researcher was prepared to provide crisis counseling and had referrals available (see Appendix J).

Session 2 (approximately 90 minutes). This session began with a mindfulness activity followed by review of homework and collection of the meditation log. There was a discussion of the participant’s experiences practicing the different techniques along with
any questions or concerns about these techniques. Next, there was a discussion of how to incorporate mindfulness into childbirth. Sitting with sound was introduced, and this technique was practiced. A discussion of experiences followed. The participant then practiced a full body scan followed by a discussion of her experiences. Finally, homework was reviewed for the upcoming week, which included daily practice of sitting with sound, informally practicing mindfulness of breath, informally practicing mindfulness in daily life, and daily practice of the full body scan. Again, the participant was instructed to use the meditation log. We ended with a mindfulness activity.

Session 3 (approximately 90 minutes). Both auditory and physical distraction techniques were added into this session to allow participants an opportunity to learn how to practice mindfulness in the midst of distractions. This was explained to participants at the beginning of this session. This session began with a mindfulness activity incorporating both physical and auditory distractions followed by review of homework and collection of the meditation log. There was a discussion of the participant’s experiences practicing the different techniques along with any questions or concerns about these techniques. Next, the researcher introduced the technique of sitting with thoughts and feelings. The participant practiced this technique followed by a discussion of her experiences. Since this was a new skill being learned, distraction techniques were not used during this exercise. The participant then practiced a full body scan incorporating distraction techniques followed by a discussion of experiences. Finally, homework was reviewed for the upcoming week, which included daily practice of sitting with thoughts and feelings, informally practicing awareness of one pleasant and one unpleasant event, informally practicing mindfulness of breath, informally practicing
mindfulness in daily life, and daily practice of the full body scan. The participant was instructed to use the mediation log and to practice with distractions present. We ended with a mindfulness activity.

*Session 4 (approximately 90 minutes).* This final session began with a mindfulness activity incorporating distraction techniques followed by review of homework and collection of meditation logs. There was a discussion of the participant's experiences practicing the different techniques along with any questions or concerns about these techniques. Walking meditation was introduced and the participant practiced this technique followed by a discussion of experiences. Finally, we discussed creating one's own meditation program for daily practice, and the participant was guided in developing her own meditation program. She was encouraged to continue this daily practice until at least childbirth. The participant completed the KIMS to assess for changes following training and completed the postprogram evaluation form version A (see Appendix H) to assess for her perceptions regarding the usefulness of the techniques learned. We ended with a mindfulness activity.

Finally, the participant was provided with two business cards that had the student investigator's telephone number. She was asked to contact the researcher following childbirth while still in the hospital. She was informed that the purpose for this was twofold: to allow her an opportunity to discuss the birthing experience with her session trainer and to complete postpartum assessment measures. The participant was reminded that if she wished to withdraw from this study at any point, she simply needed to sign and return the withdrawal of consent form which was mailed to her one week prior to her estimated due date. If this form was not received one week following her estimated due
date and the participant had not contacted the researcher, the participant was reminded that the researcher would attempt to contact her.

Postpartum Assessment

One week prior to participants' estimated due date, they were mailed a withdrawal from the study form along with a postage paid self-addressed envelope (see Appendix K for withdrawal from the study form and letter sent with this form). Participants were instructed to return this form postpartum only if they wished to withdraw from the study. If the form was not returned, the student investigator assumed that the participant wished to continue participating in the study.

Participants were asked to contact the researcher following childbirth while still in the hospital. They were told that the researcher could visit them in the hospital to collect postpartum assessment measures. However, the majority of participants contacted the researcher either after they were discharged or the day of discharge. Therefore, all participants were mailed follow-up assessment measures within 1-2 days after notifying the researcher that they had given birth. They were provided with a letter describing directions for completing and returning the postpartum assessment measures (see Appendix L). Participants were asked to complete the W-DEQ/B, STAI, KIMS, the Kyman Maternal Satisfaction Questionnaire (Kyman, 1991), the Labor and Delivery form (see Appendix H), and either the Post-program Mindfulness Practice Assessment form or the Stress-Management Practice Assessment form (see Appendix H for measures) depending on which condition they had been assigned. Also, participants who had not completed their childbirth preparation class prior to the pretreatment session were
provided with the Childbirth Preparation Class Assessment form (see Appendix H). All participants were provided with a postage paid, self-addressed envelope to return the forms.

If participants did not contact the researcher one week following their estimated due date and no withdrawal from the study form was returned, then the researcher contacted them. This occurred for only two participants. If the participant had given birth and was still willing to participate in the study, she was mailed the postpartum assessment measures along with a postage paid self-addressed envelope in which she could return these measures. However, neither participant could be reached via telephone. Therefore both were mailed out postpartum assessment measures and the corresponding letter. One participant completed the study, and one participant dropped out of the study.

Treatment Integrity

To ensure treatment fidelity and integrity, the researcher role-played each session with a graduate or undergraduate student prior to it being conducted for the first time with the first participant. All graduate trainers also role-played each session prior to conducting their first session. As an integrity check, all of the sessions were video-taped or audio-taped, and 25% were randomly selected for viewing by a trained observer. The trained observer watched/listened to the tapes to provide a rating of the researcher's adherence to the intervention protocol and overall interaction with the participant. The observer was not provided with any identifying information of the participant. The trained observer coded 25% of the sessions, chosen at random, according to the therapist adherence form (see Appendix M). The researcher or trainer completed the same measure
of treatment compliance for these sessions. The trainer's and the coder's completed measures were compared to determine compliance with the protocol and internal reliability. Once tapes were reviewed and rated for treatment adherence, they were destroyed. The student investigator and RAs also met with Dr. Naugle (the principal investigator) at least one hour per week for supervision.

Agreement and Treatment Adherence Results

The Therapist Adherence form (see Appendix M) was used to assess therapists' adherence to the training protocol for didactics, experiential exercises, and homework. Therapists completed this form of treatment compliance for each of their training sessions. As an integrity check, all of the sessions were either video- or audio-taped, and 25% were randomly selected for viewing by trained observers/coders in the clinical psychology doctoral program. The coder was blind to the participants' intervention condition and completed an adherence rating form for each session reviewed.

Kappa was used to calculate adherence ratings and inter-rater agreement for each question. See Table 1 for range of kappa values. Over 96.5% of kappa values were .75 or greater indicating good reliability and adherence to the treatment protocol. The average kappa value for adherence and inter-rater agreement for the treatment adherence form was .941, kappa was .95 for the didactics portion of this form, .97 for experiential activities, and .89 for homework. Table 1 presents range, number of kappa values per range, and percentage of kappa agreement.
Table 1

Kappa Coefficients for Treatment Adherence Ratings

<table>
<thead>
<tr>
<th>Kappa Value Range (k)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>38</td>
<td>63.3</td>
</tr>
<tr>
<td>.90-.99</td>
<td>4</td>
<td>6.7</td>
</tr>
<tr>
<td>.80-.89</td>
<td>13</td>
<td>21.7</td>
</tr>
<tr>
<td>.70-.79</td>
<td>3</td>
<td>5.0</td>
</tr>
<tr>
<td>.60-.69</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>.55</td>
<td>1</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Measures

Demographic Form. The demographic form is a self-report measure developed by the student investigator to gather basic information about the participant, such as age, race, level of education, and obstetric history.

Childbirth Preparation Class Assessment. This measure was developed by the student investigator to gather information regarding topics and techniques reviewed and practiced within the childbirth class including the amount of time spent discussing and practicing each topic.

Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ; Wijma et al., 1998). This is a 33-item self-report measure. Version A assesses a woman’s fears about childbirth, and version B assesses a woman’s actual childbirth experience. Scores range from 0 to 165 with higher scores indicating greater fear of childbirth. Previous research has used scores above 84 as the cutoff point for serious childbirth fear (Ryding, Wijma,
Wijma, & Rydhstrom, 1998). This measure has high internal consistency reliability and split-half reliability in addition to good construct validity (Wijma et al., 1998).

State Trait Anxiety Inventory (STAI; Spielberger et al., 1983). This instrument consists of two 20-item self-report measures that assess both state-anxiety and trait-anxiety. Participants respond on a 4-point Likert scale. This measure has high internal consistency with alpha coefficients ranging from 0.91-0.95 for adults for the STAI-state and good construct validity (Spielberger et al., 1983). It has also been reported to be appropriate for use with pregnant women (Rizzardo, Magni, Cremonese, Talamo, & Cosentino, 1988).

The Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al., 2004). This is a 39-item self-report measure that assesses the use of mindfulness skills. It consists of four scales of mindfulness skills: observe, describe, act with awareness, and accept without judgment. This measure has shown high content validity and high internal consistency, as well as adequate test-retest reliability (Baer et al., 2004).

Meditation Log. This form was used on a weekly basis for participants in the MF condition to record their frequency and duration of time spent in meditation practice.

Kyman Maternal Satisfaction Questionnaire (KMSQ; Kyman, 1991). This 12-item self-report measure was designed to assess participants' satisfaction with the birth experience. It consists of adjective pairs that are polar opposites (i.e., happy-unhappy). Participants respond on a 7-point scale. This measure has shown adequate test-retest reliability and content validity (Kyman, 1991).

Post-program Evaluation Questionnaire. This form was developed by the student investigator and was used to evaluate participants' perceptions regarding the usefulness
and adherence to what they learned. Two versions were developed, with version A applicable to participants in the MF condition and version B applicable to participants in the SM condition.

Posttreatment Mindfulness Practice Assessment. This measure was developed by the student investigator to gather information regarding participants’ average frequency and duration of mindfulness practice between posttreatment and childbirth along with information about which techniques were practiced.

Stress-Management Practice Assessment. This measure was developed by the student investigator to gather information regarding participants’ average frequency and duration of practice of stress-management techniques between posttreatment and childbirth along with information about which techniques were practiced.

Labor and Delivery Form. This form was developed by the student investigator and was used to gather self-report information about the participant’s labor and delivery experiences, such as type of delivery, use of medication, and medical interventions.

Therapist Adherence Form. This form was developed by the student investigator and was used by the researcher or trainer as a measure of treatment compliance. It was also used as an integrity check by trained observers who randomly viewed 25% of videotapes/audiotapes of all sessions and provided a rating of the researcher’s adherence to the session protocol.
CHAPTER III

RESULTS

Stratification of Participants

Participant assignment was determined by stratification and a coin toss. Stratification to each condition was based on the frequency and duration of participants' meditative practices as reported on the Meditation Practices Assessment form. Participants' type of meditative practice was not used for stratification. It is noteworthy that the type and quality of meditation varied tremendously between participants, with a higher number of participants in the MF group endorsing more traditional forms of meditation practice. Thirty-five percent of participants ($n = 7$) reported practicing some form of meditation. Descriptive information is presented in Table 2 on the group assignment, meditation type, frequency, and duration of meditative practice.

Participants were matched as closely as possible for stratification purposes. However, matches were not identical and ended up being unevenly balanced in favor of the mindfulness group having one more participant who reported practicing meditation. Initially, participants were eligible for either group regardless of meditative practice, and group assignment was determined solely on a coin toss. After several participants endorsed meditative practice, the student investigator began to implement stratification procedures. However, since it was difficult recruiting participants and a minority of participants practiced meditation, stratification turned into rotation of assigning
Table 2

*Stratification Summary by Meditation Practices Assessment (n = 7)*

<table>
<thead>
<tr>
<th>Group</th>
<th>Meditative Type</th>
<th>Frequency</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mindfulness</td>
<td>Sitting and walking</td>
<td>3 times/week</td>
<td>Less than 30 min</td>
</tr>
<tr>
<td>Stress-management</td>
<td>Modified yoga/prayer</td>
<td>3 times/week</td>
<td>Less than 30 min</td>
</tr>
<tr>
<td>Mindfulness</td>
<td>Yoga</td>
<td>3 times/week</td>
<td>Less than 30 min</td>
</tr>
<tr>
<td>Stress-Management</td>
<td>Prayer</td>
<td>Everyday</td>
<td>Less than 30 min</td>
</tr>
<tr>
<td>Mindfulness</td>
<td>Birth relaxation</td>
<td>3 times/week</td>
<td>30–59 minutes</td>
</tr>
<tr>
<td>Stress-management</td>
<td>Prayer</td>
<td>Everyday</td>
<td>Less than 30 min</td>
</tr>
<tr>
<td>Mindfulness</td>
<td>Yoga</td>
<td>Once per week</td>
<td>Less than 30 min</td>
</tr>
</tbody>
</table>

participants with meditative experiences to each group resulting in an imbalance between the two groups.

Before analyses were conducted, all scales and subscales were examined for normality and outliers. Logarithm transformations were conducted for variables that were moderately to severely skewed. Transformed variables were then re-examined to determine if problems with normality were corrected. Given the small sample size, no outliers were removed from final analyses. Transformed variables were used in subsequent analyses. Table 3 provides descriptive statistics and an indication of which variables were transformed.
Table 3

*Outcome Measures as a Function of Type of Treatment and Time (2 × 3 ANOVAs)*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Group</th>
<th>Pre-Tx</th>
<th>Post-Tx</th>
<th>Postpartum</th>
<th>Time</th>
<th>Time x Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>F(2,17)</td>
</tr>
<tr>
<td>KIMS Observe</td>
<td>SM</td>
<td>35.40</td>
<td>4.97</td>
<td>41.10</td>
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</tr>
<tr>
<td></td>
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<td>7.23</td>
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<tr>
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<td>5.76</td>
<td>26.40</td>
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<td></td>
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<td>5.04</td>
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<td>KIMS Acta</td>
<td>SM</td>
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<td></td>
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<td>.08</td>
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<td>KIMS Accept</td>
<td>SM</td>
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<td>STAI-Statea</td>
<td>SM</td>
<td>1.50</td>
<td>.16</td>
<td>-</td>
<td>-</td>
<td>1.49</td>
</tr>
<tr>
<td></td>
<td>MF</td>
<td>1.49</td>
<td>.08</td>
<td>-</td>
<td>-</td>
<td>1.48</td>
</tr>
<tr>
<td>STAI-Traita</td>
<td>SM</td>
<td>1.60</td>
<td>.14</td>
<td>-</td>
<td>-</td>
<td>1.54</td>
</tr>
<tr>
<td></td>
<td>MF</td>
<td>1.54</td>
<td>.08</td>
<td>-</td>
<td>-</td>
<td>1.52</td>
</tr>
<tr>
<td>KMSQ</td>
<td>SM</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>77.50</td>
</tr>
<tr>
<td></td>
<td>MF</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>73.70</td>
</tr>
</tbody>
</table>

*Note.* SM n = 10; MF n = 10. *Logarithm Transformation; F(2,17); F(1,18). *p < .05. **p < .01.
Preexisting and Baseline Differences

Groups were compared on pretreatment measures to determine whether any significant differences ($p < .05$) existed at baseline. Participants were significantly different on KIMS observe pretreatment score, $t(18) = -2.88, p = .01, g = -1.19$ (two-tailed). The MF group had a significantly higher pretreatment observe score ($M = 43.4, SD = 7.23$) compared to the SM group ($M = 35.4, SD = 4.97$). No other pretreatment differences were found.

Analysis of Hypotheses

Hypothesis 1

It was hypothesized that all participants would demonstrate an increase in mindfulness skills from pre- to posttreatment. Moreover, participants in the MF condition would report higher mindfulness scores posttreatment and postpartum compared to participants in the SM condition. This outcome was measured by the four scales of the KIMS (observe, describe, act with awareness, and accept without judgment) assessed at pretreatment, posttreatment, and postpartum. A mixed between-within subjects analysis of variance was used to analyze the data.

*KIMS Observe Score.* There was no significant interaction between group and time, Wilks Lambda = .742, $F (2, 17) = 2.959, p = .079$. However, this interaction approached significance, and visual analysis of the data suggests that time 1 and time 3 produced larger discrepancies between groups than did time 2, with the MF group having higher scores across all three time periods (see Figure 1). Although it was predicted that
the MF group would have higher scores at times 2 and 3, this group also had a higher score at time 1, yet differences were nonsignificant. However, there was still a small effect size found in favor of the MF group when comparing change scores from pretreatment to postpartum, $g = -0.19$. Both groups had an increase in average scores from time 1 to time 3, yet the MF group had a larger increase.

![KIMS Observe Score by Group](image)

**Figure 1.** KIMS Observe Score by Group

Results showed a significant main effect for time, Wilks Lambda = .417, $F(2, 17) = 11.881$, $p = .001$. Pairwise comparisons showed a significant difference between time 1 ($M = 39.4, SD = 1.39, p = .003$) and time 2 ($M = 43.7, SD = 1.38$) and a significant difference between time 2 and time 3 ($M = 40.55, SD = 1.63, p = .009$). As expected, participants' scores improved from time 1 to time 2. However, from time 2 to time 3, there was a decrease in participants' scores. As Figure 1 highlights, there was a larger
decrease in observe scores from time 2 to time 3 for the SM group compared to the MF group, yet this was nonsignificant.

The main effect for the two interventions was significant, $F(1, 18) = 8.202, p = .010$. Participants in the MF group had higher observe scores compared to those in the SM group.

*KIMS Describe Score.* No significant interaction was found between group and time, Wilks Lambda = .807, $F(2, 17) = 2.038, p = .161$, see Figure 2. Main effects were nonsignificant for time, Wilks Lambda = .869, $F(2, 17) = 1.279, p = .304$, and for the two interventions, $F(1, 18) = 1.388, p = .254$. However, when change scores were calculated for pretreatment to postpartum, there was a large effect size found in favor of the MF group, $g = -.85$. On average, participants in the MF group had an increase in scores whereas those in the SM group had a decrease in scores.

![KIMS Describe Score by Group](image)

*Figure 2. KIMS Describe Score by Group*
**KIMS Act With Awareness Score.** Logarithm transformations were conducted for all three time periods. There was no significant interaction between group and time, Wilks Lambda = .918, $F(2, 17) = .76, p = .483$, see Figure 3. Also, the main effect for time was nonsignificant, Wilks Lambda = .916, $F(2, 17) = .775, p = .476$. For the two interventions, results approached significance, $F(1, 18) = 3.85, p = .065$. Figure 3 shows that the MF group had higher act with awareness scores which occurred across all three conditions. Effect size for change scores from pretreatment to postpartum were small, $g = -.33$, in favor of the MF group. Again, the average act with awareness score increased for participants in the MF group whereas those in the SM group had a decrease in scores.

![KIMS Act with Awareness Score by Group](image)

*Figure 3. KIMS Act With Awareness Score by Group*

**KIMS Accept Without Judgment Score.** Although transformations were attempted for these variables, they were unable to be computed due to an illegal operation reported
for the nonskewed variables. Therefore, analyses were performed with the nontransformed variables for this scale.

The interaction between group and time was nonsignificant, Wilks Lambda = .843, $F(2, 17) = 1.587, p = .233$, see Figure 4. There were nonsignificant results for the main effect for time, Wilks Lambda = .776, $F(2, 17) = 2.45, p = .116$ as well as the main effect comparing the two interventions, $F(1, 18) = .989, p = .333$. However, an effect size for change scores from pretreatment to postpartum was moderate, $g = -.75$, in favor of the MF group. The same pattern of change was found with the MF group showing an average increase in scores and the SM group showing an average decrease in scores.

![KIMS Accept without Judgment Score by Group](image)

*Figure 4. KIMS Accept Without Judgment Score by Group*

**Hypothesis 2**

It was hypothesized that participants in the MF condition would have fewer obstetric complications, lower medication use, lower fear of childbirth, less anxiety, and
higher maternal satisfaction of childbirth compared to participants in the SM condition. These outcomes were measured by the Labor and Delivery Assessment form, the W-DEQ, the STAI, and the Kyman Maternal Satisfaction Questionnaire. A mixed between-within subjects analysis of variance was used to analyze the following data.

**WDEQ Score.** Logarithm transformations were conducted for both assessment time periods. Levene’s test of equality of error variances was significant for WDEQ-B ($p = .034$). However, the $F$ test is robust to violations of homogeneity of variance when these violations are small or moderate, especially with equal sample sizes (Maxwell & Delaney, 1990). Therefore, no further corrections were performed.

Results showed no significant interaction between group and time, Wilks Lambda $= .894$, $F (1, 18) = 2.134$, $p = .161$, see Figure 5. However, the main effect for time was significant, Wilks Lambda $= .547$, $F (1, 18) = 14.877$, $p = .001$. Participants reported significantly lower scores for fear of childbirth postpartum ($M = 1.85$, $SD = .02$) compared to pretreatment ($M = 1.92$, $SD = .02$). It isn’t surprising that after a fearful event has passed, fear scores would decrease, yet this result should be interpreted with caution due to the violation of homogeneity which may increase the chance of finding a significant difference when none exists. Tabachnick and Fidell (1996) suggest that one could use nontransformed data with a more stringent criterion to control for this violation. However, if this method were applied (i.e., $p < .01$), the result would still be significant ($p = .004$).

Finally, the main effect comparing the two interventions was significant, $F (1, 18) = 5.032$, $p = .038$. Participants in the SM group reported significantly lower fear of
Figure 5. WDEQ Score by Group

childbirth ($M=1.85, SD = .02$) compared to the MF group ($M = 1.92, SD = .02$). The same caution should be noted for interpretation of this result. Again, if a more stringent criterion were applied to nontransformed data (i.e., $p < .01$), the result would no longer be significant ($p = .037$). Therefore, it appears that there may have been one or more participants in the MF group with a large deviation score. Both groups had an average decrease in fear of childbirth from pretreatment to postpartum. However, effect sizes were moderate ($g = .55$) for change scores and favored the SM group. This was an opposite effect from the hypothesis.

STAI-State Score. Logarithm transformations were conducted for both assessment time periods. Again, Levene's test of equality of error variances was significant for STAI-state pretreatment ($p = .012$). However, there were no significant results found for the state scores, and having unequal variances is unlikely to decrease the possibility of
finding a significant result. Results for the group interaction was nonsignificant, Wilks Lambda = .999, $F(1, 18) = .01, p = .923$ as were the main effects for time, Wilks Lambda = .997, $F(1, 18) = .06, p = .81$ and group intervention, $F(1, 18) = .043, p = .838$, see Figure 6. However, a small effect size ($g = .17$) was found in favor of the SM group when comparing change scores from pretreatment to postpartum. Again, this was contrary to the original hypothesis. Participants in the SM group had an average decrease in state anxiety whereas participants in the MF group had an average increase in state anxiety.

![STAI-State Score by Group](image)

*Figure 6. STAI-State Score by Group*

*STAI-Trait Score.* Logarithm transformations were conducted for both assessment time periods. There was no significant interaction between group and time, Wilks Lambda = .928, $F(1, 18) = 1.387, p = .254$, see Figure 7. However, the main effect for time was significant, Wilks Lambda = .722, $F(1, 18) = 6.939, p = .017$. Participants had
significantly lower STAI-trait total scores postpartum compared to pretreatment. The norm for working adults in this age range was $M = 36.15, SD = 9.53$. When reviewing nontransformed mean scores, participants were slightly above norm pretreatment ($M = 38.7, SD = 2.47$) compared to postpartum ($M = 34.9, SD = 2.24$). Therefore, this difference, although statistically significant, does not appear to be clinically significant. The main effect comparing the two interventions was nonsignificant, $F(1, 18) = .684, p = .419$. A moderate effect size ($g = .72$) was found in favor of the SM group when comparing change scores from pretreatment to postpartum. This result was contrary to the hypothesis. This time, both groups had an average decrease in trait anxiety yet the decrease was greater in the SM group.

![STAI-Trait Score by Group](image)

*Figure 7. STAI-Trait Score by Group*
Kyman Maternal Satisfaction Score. An independent-samples t test was conducted to compare the maternal satisfaction scores for the MF and SM groups. There was no significant difference in scores between groups, \( t(18) = 1.087, p = .292 \) (two-tailed). There may have been a ceiling effect for this measure as most participants were highly satisfied with their childbirth experience. The SM group had higher maternal satisfaction scores \( (M=77.5, SD=7.397) \) compared to the MF group \( (M=73.7, SD=8.22) \), yet the highest score possible for this scale is 84.

Labor and Delivery Assessment. The Labor and Delivery Assessment form was used to classify participants as having experienced either an intrusive or nonintrusive childbirth. Participants were classified as having an “intrusive childbirth” if any of the following occurred: unplanned cesarean delivery, induction or augmentation of labor by medication (i.e., pitocin), vaginal delivery with medication, use of forceps, or use of vacuum extraction. If participants did not have any of the above experiences, then they were classified as “non-intrusive childbirth.”

A chi-square test for independence indicated that the data violated the minimum expected cell frequency assumption. Therefore, Fisher’s Exact Probability Test was used. Examination of the two groups showed a nonsignificant difference \( (P = .5; \text{Fisher’s Exact Test}) \) where 50% of the SM group \( (n = 5) \) and 60% \( (n = 6) \) of the MF group had an intrusive childbirth experience. Since participants’ desire for an unmedicated childbirth was not assessed at pretreatment and data was not available regarding medication dosage, this variable was then dropped from the classification system. When vaginal delivery with medication was eliminated from the classification, results remained nonsignificant \( (P = \)
.5; Fisher’s Exact Test). However, more participants in the SM group were now classified as having an intrusive birth ($n = 4, 40\%$) compared to the MF group ($n = 3, 30\%$).

Effect Sizes

To supplement ANOVA results, change scores from pretreatment to postpartum were calculated to compute between-groups effect sizes with Hedges $g$ (Hedges & Olkin, 1985).\(^1\) For the KIMS, change scores were computed with the pretreatment and postpartum scores for each of the four scales. The posttreatment score for the KIMS was not included in these analyses as this assessment point served as an integrity check for training, and the main point of interest was participants’ change in mindfulness skills from pretreatment to postpartum. See Table 4 for descriptive statistics for change scores and effect sizes.

For the KIMS four scales, all of the effect sizes favored the MF group. The observe and act with awareness scales produced small effect sizes, a moderate effect size was found for the accept without judgment scale, and a large effect size was found for the describe scale. The remaining scales all favored the SM group. The STAI-State scale produced a small effect size while the STAI-Trait and WDEQ scales produced a moderate effect size.

\(^1\) Cohen (1988) defines effect sizes of 0.20 as small, 0.50 as medium, and 0.80 as large.
Table 4

*Change Score Descriptive Statistics and Effect Sizes*

<table>
<thead>
<tr>
<th>Measures</th>
<th>SM ((n = 10))</th>
<th>MF ((n = 10))</th>
<th>(g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observe</td>
<td>.50 8.03</td>
<td>1.80 3.58</td>
<td>-.19</td>
</tr>
<tr>
<td>Describe</td>
<td>-.60 3.72</td>
<td>3.00 4.08</td>
<td>-.85</td>
</tr>
<tr>
<td>Act</td>
<td>-.80 5.18</td>
<td>.60 2.01</td>
<td>-.33</td>
</tr>
<tr>
<td>Accept</td>
<td>-.70 6.91</td>
<td>3.80 3.58</td>
<td>-.75</td>
</tr>
<tr>
<td>WDEQ</td>
<td>16.50 9.47</td>
<td>7.10 20.40</td>
<td>.55</td>
</tr>
<tr>
<td>State</td>
<td>1.40 6.2</td>
<td>-.40 12.28</td>
<td>.17</td>
</tr>
<tr>
<td>Trait</td>
<td>6.00 4.99</td>
<td>1.60 6.28</td>
<td>.72</td>
</tr>
</tbody>
</table>

*Hypothesis 3*

It was hypothesized that participants who reported more time spent practicing mindfulness would have fewer obstetric complications, lower medication use, lower fear of childbirth, less anxiety, and higher maternal satisfaction of childbirth. This was measured by participants' weekly meditation practice log, the Post-program Mindfulness Practice Assessment form, the Stress-Management Practice Assessment, the Labor and Delivery Assessment form, the W-DEQ, the STAI, and the Kyman Maternal Satisfaction Questionnaire.

For each subgroup (MF and SM) of participants, independent samples *t* tests were conducted to compare mean scores on various dependent measures to determine whether participants that spent more time practicing these skills had more beneficial outcomes.
Although other analyses could have been used to determine who might benefit from this training, we chose the most parsimonious and simplistic means for analyzing these data.

For each of the groups, participants were classified as high or low in the amount of time spent practicing based on a median split. For the MF group, both the Post-program Mindfulness Practice form (PPMP) and participants’ weekly meditation logs were used for classification. Practice times were calculated by summing participants’ average weekly practice reported on the PPMP form plus participants’ average weekly practice as reported on the meditation logs. This factored in practice times both during and after training. For the SM group, practice times were calculated by summing participants’ average weekly practice on the Stress-Management Practice Assessment form. Results for both groups follow.

**Stress-Management Group.** Results were nonsignificant for all but one comparison. Participants categorized in the high practice group had significantly higher STAI-state scores pretreatment ($M = 1.60, SD = .18, p = .043$) compared to participants in the low practice group ($M = 1.40, SD = .05$). It seems logical that those with higher levels of anxiety might be more inclined to practice stress/anxiety-management skills.

**Mindfulness Group.** There was one significant difference found between low and high practice groups for the MF intervention. Participants in the high practice group had significantly less fear of childbirth postpartum ($M = 1.83, SD = .08, p = .024$) compared to participants with low practice scores ($M = 1.98, SD = .09$). Descriptive statistics of nontransformed data showed a difference of almost 30 points between the high practice group ($M = 67.8, SD = 12.76$) and the low practice group ($M = 96.4, SD = 20.16$).
Anecdotal Data From Childbirth

All participants reported that the training was helpful for childbirth, regardless of condition. Participants in both groups reported that they relied heavily on focused breathing, yet those in the MF group appeared to incorporate other elements of their training more often than participants in the SM group; no participant in the SM group reported using relaxation. The other sitting meditations (i.e., mindfulness of sound and mindfulness of thoughts and feelings) seemed to be used equally amongst MF participants, and the body scan technique was used by several participants. However, the walking meditation was rarely reported.

The majority of MF participants indicated that as the intensity and frequency of contractions increased, their ability to be mindful decreased. A similar report was provided by the SM participants, stating that they focused on breathing throughout childbirth, but as labor intensified, they were more likely to request medication as a coping strategy. Both groups were also less likely to try additional laboring techniques that they had learned from their childbirth preparation class as their labor intensified. Additionally, when unexpected issues arose, such as preterm delivery or water breaking before a planned cesarean section, participants reported feeling out-of-control. However, MF participants indicated that they attempted to use the thoughts and feelings meditation at these points, and they often noted a decrease of intense feelings as a result. Most MF participants suggested that they “hung in there for as long as possible,” and some reported that medical staff were impressed with their ability to labor for as long as they did without medication. However, it seems that the majority of participants viewed mindfulness as a
“tool” (i.e., a means to an end) to provide them with the type of birth experience that they wanted, i.e., pain- and anxiety-free. It seemed that finding a way to access that birth experience was the greater issue for participants, and when mindfulness no longer seemed to be providing a way for that to occur, participants discontinued its use and opted for medical interventions. However, in the end, most participants reported being highly satisfied with their birth.

Participant Evaluation of Each Program

Descriptive statistics were calculated for the evaluation form completed for the SM group (see Table 5) and the MF group (see Table 6). Generally, mean scores between the two groups appear fairly similar for identical questions with the exception of question 5. Although this may appear that the MF group was less invested in learning the techniques, there was very little requested of the SM group in comparison to the MF group. Therefore, it seems likely that it would be much easier for a participant in the SM group to give a higher rating on this question.
Table 5

*Descriptive Statistics for Stress-Management Evaluation Scores*

<table>
<thead>
<tr>
<th>Question</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How sensible was the rationale for the stress-management techniques?</td>
<td>4.4</td>
<td>.52</td>
<td>4-5</td>
</tr>
<tr>
<td>2. How effective was the instructor in communicating and teaching you the techniques?</td>
<td>4.9</td>
<td>.32</td>
<td>4-5</td>
</tr>
<tr>
<td>3. How motivated did the instructor appear?</td>
<td>4.9</td>
<td>.32</td>
<td>4-5</td>
</tr>
<tr>
<td>4. How helpful would more contact with the instructor have been?</td>
<td>1.8</td>
<td>1.03</td>
<td>1-4</td>
</tr>
<tr>
<td>5. How much effort did you put into learning these techniques?</td>
<td>4.5</td>
<td>.71</td>
<td>3-5</td>
</tr>
<tr>
<td>6. How well do you feel you have mastered the techniques that you were taught?</td>
<td>3.6</td>
<td>.70</td>
<td>2-4</td>
</tr>
<tr>
<td>7. To what extent do you specifically and intentionally plan to continue to use these techniques?</td>
<td>4.1</td>
<td>.74</td>
<td>3-5</td>
</tr>
</tbody>
</table>
Table 6

Descriptive Statistics for Mindfulness Evaluation Scores

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>How sensible was the rationale for the mindfulness techniques?</td>
<td>4.2</td>
<td>.63</td>
<td>3–5</td>
</tr>
<tr>
<td>2</td>
<td>How effective was the instructor in communicating and teaching you the techniques?</td>
<td>4.6</td>
<td>.52</td>
<td>4–5</td>
</tr>
<tr>
<td>3</td>
<td>How motivated did the instructor appear?</td>
<td>4.5</td>
<td>.53</td>
<td>4–5</td>
</tr>
<tr>
<td>4</td>
<td>How helpful would more contact with the instructor have been?</td>
<td>2.2</td>
<td>.79</td>
<td>1–3</td>
</tr>
<tr>
<td>5</td>
<td>How much effort did you put into learning these techniques?</td>
<td>3.6</td>
<td>.52</td>
<td>3–4</td>
</tr>
<tr>
<td>6</td>
<td>How compliant were you in completing the homework assignments?</td>
<td>3.6</td>
<td>.52</td>
<td>3–4</td>
</tr>
<tr>
<td>7</td>
<td>How well do you feel you mastered the techniques that you were taught?</td>
<td>3.7</td>
<td>.68</td>
<td>3–5</td>
</tr>
<tr>
<td>8</td>
<td>How effective were the techniques you have learned?</td>
<td>4.3</td>
<td>.68</td>
<td>3–5</td>
</tr>
<tr>
<td>9</td>
<td>To what extent do you specifically and intentionally plan to continue to use these techniques?</td>
<td>4.1</td>
<td>.32</td>
<td>4–5</td>
</tr>
<tr>
<td>10</td>
<td>To what extent do you think the techniques have become “second nature” to you; that is, they are learned such that you don’t have to specifically and intentionally use them, it just kind of happens?</td>
<td>3.1</td>
<td>.99</td>
<td>2–5</td>
</tr>
</tbody>
</table>
CHAPTER IV

DISCUSSION

The purpose of this project was to investigate the effects of mindfulness training on obstetric outcomes and maternal satisfaction with childbirth, specifically focusing on whether mindfulness training was more effective than a stress-management control group. The goal of the MF group was to increase participants’ moment-to-moment awareness of thoughts, feelings, and body sensations during childbirth via an adapted form of MBSR so that participants would respond to their childbirth experiences rather than react to them in an automatic manner based on habit, negative thoughts, or emotions. It was hypothesized that these strategies would help a laboring woman minimize any fear or anxiety associated with pain or complications and be more adaptive to whatever circumstances arose.

General Conclusions From Hypotheses

The hypotheses of this study were partially supported. Although it was hypothesized that all participants would have an increase in mindfulness skills from pre- to posttreatment, this was only supported by the KIMS observe scale. Participants reported higher mindfulness skills at time 2 compared to time 1, yet there was a significant decrease from time 2 to time 3. It was also hypothesized that participants in the MF condition would have higher mindfulness scores posttreatment and postpartum compared to the SM group. Although there was a significant main effect for group with
MF participants having higher mindfulness scores on the observe scale compared to the SM participants, the interaction was nonsignificant; therefore, this difference was not significant at specific time periods as was hypothesized. No other inferential statistics were significant for this hypothesis. However, change scores from pretreatment to postpartum produced small to large effect sizes all in favor of the MF group. The SM group had decreases in these skills for the describe, act with awareness, and accept without judgment scales, whereas the MF group had increases in all four scales. This suggests that the training was more effective in the MF group than the SM group for increasing mindfulness skills pretreatment to postpartum. However, although this is statistically significant, it may not be clinically significant as few differences were noted among other dependent measures. It is also possible that with a larger sample size, results would have produced more significant findings.

The second hypothesis was not supported. In fact, in some instances, the opposite was found. Although scores on the WDEQ indicated a significant main effect for time, this was not surprising. It seems logical that scores for the fearful event would decrease once that event had passed. There was also a significant main effect for group, suggesting that the SM group had significantly lower scores, yet after correcting for violation of the assumption of equal variances, the results were no longer significant. Although inferential statistics failed to produce differences between groups and both groups had decreases in fear postpartum, there was a moderate effect size found for change scores in the WDEQ which favored the SM group.

There was also a significant main effect for time for the STAI-trait score. Although one might question how a trait score would change significantly, this is not an
uncommon finding (Shapiro, Schwartz, & Bonner, 1998). Regardless of the statistical significance, this had no clinical significance as this sample was from a nonclinical population, and scores were near the norm for this age group. Therefore, the pretreatment scores were already within normal limits allowing for little change to occur postpartum. Other studies (i.e., Kabat-Zinn et al., 1992; Miller et al., 1995) reporting significant decreases in anxiety at follow-up had used clinical populations along with different measures of anxiety. However, Shapiro and colleagues (1998) reported a significant decrease in state anxiety scores at posttreatment with a nonclinical sample, yet their study compared results to a wait-list control group whereas this study compared results to a group trained in an established anxiety and stress-management treatment.

The effect size for change scores was small for the STAI-State and moderate for the STAI-Trait, both favoring the SM group. It is possible that the SM intervention was more successful at decreasing participants' reports of anxiety. After all, the skills that these participants were taught have much research supporting their use for treating stress and anxiety-related problems. If anxiety was kept at moderate levels, it may have been helpful to motivate these participants to use the resources available to them to actively cope with and manage their labor (Beebe, Lee, Carrieri-Kohlman, & Humphreys, 2007). Alternatively, the MF group may be more adept at noticing their feelings and this may have led to higher scores reported for them.

Finally, both the KSMQ and the labor and delivery assessment resulted in nonsignificant findings. However, the KMSQ had a small effect size favoring the SM group when comparing postpartum scores. One reason for the nonsignificant results on the KMSQ may be related to a possible ceiling effect, and this measure may not have
been sensitive enough to separate the actual birth experience from the experience of having a new baby. Additionally, there was a participant in the MF condition who gave birth prematurely and had a very low satisfaction score.

The third hypothesis was partially supported. For the SM group, participants that had high practice scores had significantly higher STAI-state scores pretreatment compared to those with low practice scores. It seems reasonable to expect that individuals with higher levels of anxiety would be more likely to practice skills aimed at reducing stress/anxiety. For the MF group, participants in the high practice group had significantly less fear of childbirth postpartum compared to participants with low practice scores. Although there was a difference of almost 30 points between these groups, it's possible that the participant with the preterm delivery affected this result. However, it is also possible that participants with higher practice scores might have been less likely to let their fear of childbirth cause distress during that experience. It seems that participants who practiced more often would be more likely to learn that their thoughts and feelings do not need to control them, and if this was applied to the childbirth experience, it may have resulted in lower reports of fear of childbirth postpartum.

The lack of significant results were surprising since treatment adherence ratings were high and prior research had shown MBSR to be effective with various conditions, including pain and anxiety. There may be several explanations for these results.
Measurement Issues

*KIMS Measurement Issues*

One possible explanation could be related to measurement issues. The KIMS may not capture the quality of observation occurring when a person is being mindful (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). For instance, Baer and colleagues reported that the observe scale was composed of the observation of external stimuli, internal stimuli, and being on “automatic pilot.” This may not capture the essence of observing mindfully. Additionally, Baer and colleagues (2006) noted that participants who are new to meditation show a negative correlation between observing and nonjudging. They suggested that participants with no meditative experience may view observing as being equivalent to judging. They found that as one’s strength of mindfulness increased, there was a corresponding increase in nonjudgment and a positive correlation between the two. Therefore, another potential problem is that not all of the KIMS scales may change at the same rate or a change in one scale may be dependent on changes on another scale.

The various scales of the KIMS could affect each other differently, and there is no measure within this scale to assess how fluid a person is for switching between these skills. This seems to be a critical issue for childbirth as a woman would need to be able to observe and describe what is happening, act with awareness by trying out various labor and childbirth techniques, observe and describe how effective these techniques were, accept what is happening in that moment, and decide whether she should continue with a technique or try another one.
Another potential problem with this measure is that it may not capture the quality of one’s practice during sitting meditations as it is designed for measuring everyday mindfulness. There have been recent concerns regarding whether sitting meditations of MBSR affect everyday mindfulness or mindfulness in daily life (Thompson & Waltz, 2007). Although mindfulness participants were informed that both formal (i.e., sitting meditations) and informal (i.e., everyday mindfulness) practice of mindfulness are equally important, homework was largely based on sitting meditations as was practice posttreatment. It is questionable whether a stronger emphasis on everyday mindfulness might have produced different results.

*WDEQ and STAI Measurement Issues*

There are several issues that may have affected the WDEQ outcomes. First, one participant in the MF group gave birth 7-8 weeks prematurely, and her WDEQ postpartum assessment was very high compared to other participants, all of whom had full-term deliveries. Additionally, some participants gave birth by planned cesarean sections (Stress-Management $n = 3$; Mindfulness $n = 1$), and some participants had given birth previously (Stress-Management $n = 5$; Mindfulness $n = 1$). Therefore, these participants had a better idea of what to expect for childbirth. However, if previous childbirth experiences were difficult, it could have negatively affected pretreatment assessment scores.

One problem with measuring changes in affect for participants in the MF condition is that they have been taught to become *more* observant and aware of thoughts and feelings. However, participants in the SM group have been taught to *control* rather
than observe their thoughts and affect. Kostanski and Hassed (2008) note that there is a clear distinction between trying to control one’s thoughts, feelings, and sensations and realizing that one does not need to be controlled by them. It is possible that after giving birth, MF participants may have been more observant and aware of an increase in anxiety related to adjusting to a new baby whereas SM participants may have attempted to use more control techniques for coping with any increases in anxiety. Since mean scores for the STAI-state and STAI-trait scores show that the SM group had a decrease in anxiety pretreatment to postpartum, it seems that the control techniques may have been helpful for them. However, STAI-trait scores also decreased for the MF participants suggesting that, in general, they were less anxious postpartum compared to pretreatment. Therefore, this might suggest that mindfulness is most helpful for improving one’s general level of anxiety.

However, this does not answer the question of whether MF was more effective at decreasing anxiety compared to SM. The data seem to suggest that SM training may have been more effective at decreasing one’s anxiety at postpartum as effect sizes favored the SM group for both state- and trait-anxiety. Yet the SM group had higher state- and trait-anxiety scores at pretreatment compared to the MF group, and their postpartum state- and trait-anxiety scores were still higher than the MF group’s scores at pretreatment. Therefore, the SM group may have been a more highly anxious group compared to the MF group. Alternatively, this may have been simply regression to the mean, particularly for the SM trait-anxiety score which was higher in the SM group at pretreatment compared to the mean for the norm.
It is possible that training differences resulted in the effect sizes favoring the SM group. Yet it’s unclear if the SM training led to these effect sizes (i.e., due to controlling one’s emotions) or if the MF training did (i.e., due to increased awareness leading to higher reports). Although years of research support the use of stress- or anxiety-management techniques for controlling affect, Chadwick, Taylor, and Abba (2002) and Bach and Hayes (2002) provide some support that the MF intervention may also have produced these differences. Bach and Hayes reported an increase in participants’ psychotic/distressing thoughts and feelings at posttreatment, yet this had no impact on participants’ life functioning, including a lower rate of re-hospitalization. Therefore, although MF participants might report an increase in anxiety following childbirth (i.e., state-anxiety), they may be unaffected by these emotions/feelings (i.e., low reactivity). Unfortunately, this study did not include a measure to assess whether participants’ fear or anxiety impacted their daily life (i.e., distress or reactivity rating) or whether participants experienced any changes from pretreatment to postpartum regarding their response or reaction to those feelings. This might have helped shed light on whether participants simply reacted to their experiences during childbirth as opposed to making conscious choices of how to respond. Since there was no difference between groups on obstetric outcomes, one could conclude that neither of the training groups were effective or that the groups were equally effective for obstetric outcomes. However, a host of other problems exist for measuring obstetric outcomes.
Problems in Measuring Obstetric Outcomes

Numerous problems exist for assessing and comparing differences between obstetric outcomes. Beebe and colleagues (2007) suggest that duration and quality differences of labor might be related to interactions between birthing environments and individual characteristics. There were several potential problems noted in this study. First, participants in this study completed a self-report on their labor and delivery experiences. One problem with this assessment method is that participants could not provide complete data on medication issues (i.e., dosage). This form was originally intended for use by the researcher and research assistants during medical charts review. However, due to complications with multiple hospitals, institutional review boards, etc., it was decided that this form would be administered as a self-report. Therefore, medication had to be classified as an all or none occurrence rather than making finer discriminations for dosage. Additionally participants were not assessed at pretreatment to determine whether they desired an unmedicated childbirth. Therefore, regardless of the skill level attained in either group, a participant may have already decided that they wanted medication during childbirth.

Another obvious problem with this outcome was related to multiple confounds, including various provider types (i.e., certified nurse-midwife, midwife, obstetrician, family doctor, etc.), birth places (i.e., several different hospitals, two home births), childbirth preparation classes (i.e., topics discussed, practice in- and between-session of skills, intensity and frequency of meetings, childbirth goals, etc.), additional childbirth
educational resources (i.e., birthing books), individual birthing philosophy, use of a doula
during childbirth, etc. Any of these factors could have influenced obstetric outcomes.

Other Measurement Issues

As noted earlier, there may have been a ceiling effect for the KSMQ. It is possible
that this measure was not sensitive enough to separate out the actual birth experience
from the experience of having a new baby. Most participants reported very high scores for
satisfaction with childbirth. However, the researcher was unaware of any other measures
of childbirth satisfaction.

Another possible measurement issue relates to participants’ postpartum response
time. Although participants were strongly encouraged to contact the researcher
postpartum while in the hospital, most participants did not, or they contacted the
researcher on the day of discharge. Therefore, all postpartum measures were collected via
mail, and participants varied in terms of when they completed these measures with some
needing a reminder phone call to complete and return the forms. By the time most
participants completed postpartum measures, they were in the midst of adjusting to their
newborn and all of the demands that occur postpartum. It seems that one’s ability to be
mindful might have been affected by postpartum factors. Although it would have been
ideal to collect postpartum measures immediately following childbirth while participants
were still hospitalized, this might have required collaboration with medical staff.
Therapist Limitations

To date, the majority of research using MBSR as an intervention has also used a teacher that was formally trained in this practice. I was not formally trained in MBSR but was self-educated through readings, prior mindfulness experiences (i.e., DBT and ACT), and initiating my own practice. Over time, I felt that my understanding of mindfulness evolved as I spent more time in practice and more time learning about and contemplating the concept of mindfulness and its relationship to childbirth. Additionally, the two other trainers were also novices in mindfulness and were encouraged to have their own meditation practices. Although all trainers committed to having a formal practice, no one was ever assessed for changes in mindfulness skills over time. However, it is questionable whether this lack of formal training had any effect on the study outcomes as Kostanski and Hassed (2008) report that research is lacking in the areas of therapist characteristics and the need for teachers to formally practice mindfulness.

Two of the trainers trained two participants each, and the student investigator conducted all remaining training sessions. One trainer had both participants drop out of the study, and the other trainer had both participants complete the study. It is unclear whether this was related to a therapist factor, a training factor, or whether other issues such as anxiety regarding videotaping and possible miscarriage led to the participants dropping out of the study.
MBSR Limitations and Generalization to Everyday Mindfulness

Another potential limitation was that MBSR was adapted for this study using an individual rather than group format for treatment delivery, and this study did not follow the standard 8- to 10-week course typically used in MBSR. Again, the impact of this treatment variation is unknown as mindfulness research is lacking in efficacy boundaries (Kostanski & Hassed, 2008) including which types of clients might benefit from it and treatment modality.

The primary purpose of practicing mindfulness is so that one is able to become increasingly mindful in everyday life (Kostanski & Hassed, 2008). Although MBSR has the ultimate goal of increasing one’s mindfulness in everyday life, it is unclear whether the strength of one’s formal practice produces correspondingly similar increases in everyday mindfulness (Thompson & Waltz, 2007).

Thompson and Waltz (2007) investigated whether there was a relationship between a unidimensional measure of everyday mindfulness and mindfulness during a sitting meditation using inexperienced meditators. In their first study, they found no significant relationship between the two. However, when a multidimensional measure of mindfulness was used, there was a moderate relationship found between the sitting meditation and only the observe scale for the inexperienced meditators. Yet there was no relationship between sitting meditation and everyday mindfulness for the experienced meditators. Therefore, it is questionable whether the mindfulness training in this study generalized to everyday life, particularly the childbirth experience.
This study did not exclude individuals reporting prior meditative experiences. Although the majority of participants could be classified as inexperienced, there were several participants that had experience with formal meditation. For this study, it might have been beneficial to put an equal emphasis on practice of everyday mindfulness (i.e., informal practice) and sitting meditations as discussed in MBSR. Thompson and Waltz (2007) suggest that sitting meditation may be similar to “state” mindfulness, whereas everyday mindfulness may be similar to “trait” mindfulness. However, Baer and colleagues (2006) liken mindfulness to a skill or skill set that can be learned like any other skill. Therefore, the strength of one’s sitting meditation should generalize to everyday mindfulness. Although it would have been beneficial to add in a measure of sitting meditation mindfulness, such as the Toronto Mindfulness Scale (TMS; Lau et al., 2006), this scale was still under development at the time of this study.

Another problem relates to the ability of participants to practice sitting meditation for extended periods of time. Some participants reported that they had difficulty with the longer meditations, such as the body scan. For these participants, a shaping process was used where they gradually increased the length of time they sat and meditated until they were able to complete the entire body scan, for example. Although each of these participants reported that they were eventually able to meditate for up to 45 minutes each day, it is possible that some did not. Maybe a different mindfulness approach would have been more beneficial for these participants, such as mindfulness skills taught in Dialectical Behavior Therapy (DBT) which do not prescribe a set amount of practice for each day and incorporate everyday mindfulness more explicitly than MBSR. However, the extended periods of practice with MBSR seemed necessary as the goal of this study...
was for participants to be mindful during childbirth, an experience that can last for a day with strong labor possibly lasting for hours.

Problems Defining the Mindfulness Construct

There continues to be an ongoing discussion about what exactly mindfulness is and how best to measure it. Some have proposed that mindfulness can be viewed unidimensionally as awareness or enhanced attention (Brown & Ryan, 2003). Others have proposed multidimensional elements to mindfulness (Baer et al., 2004) yet measure them unidimensionally (Hayes & Feldman, 2004). Baer and colleagues (2006) examined this question by comparing the various mindfulness measures to determine whether mindfulness is best measured as multifaceted and which elements best capture the construct of mindfulness. As a result, they developed the Five-Factor Mindfulness Questionnaire (FFMQ; Baer et al., 2006) which includes a fifth factor of nonreactivity not included in the KIMS. They suggested that nonreactivity and nonjudging may better capture what “acceptance” means.

This fifth factor appears crucial to this study. A goal of this study was that participants would not react to their experiences but rather respond based on conscious choices. If a participant practiced mindfulness yet continued to be highly reactive to their experiences, it seems unlikely that one could expect anything different for childbirth. Additionally, if the construct of mindfulness is not clearly delineated, then it is more difficult for clinicians or researchers to be articulate and explain this concept to clients or participants (Baer et al., 2006).
Mechanisms of Mindfulness

Although several research articles suggest possible mechanisms of mindfulness and Shapiro, Carlson, Astin, and Freedman (2006) provide a theory of mindfulness, we still do not know what the active ingredients are (Kostanski & Hassed, 2008). To date, the main mechanisms of change reported seem to include behavioral, cognitive, and emotion regulation elements and principles. These proposed mechanisms include the following: exposure (Baer, 2003; Bondolfi, 2005; Lynch, Chapman, Rosenthal, Kuo, & Linehan, 2006; Shapiro et al., 2006), relaxation (Baer, 2003; Bondolfi, 2005), learning new responses (Lynch et al., 2006), changing emotion-linked response tendencies (Lynch et al., 2006), decreasing rule-governed behavior (Lynch et al., 2006), self-regulation (Baer, 2003; Bondolfi, 2005; Brown & Ryan, 2003; Shapiro et al., 2006), values clarification (Shapiro et al., 2006), cognitive, behavioral, and/or emotional flexibility (Arch & Craske, 2006; Shapiro et al., 2006), cognitive change or changes in cognitive appraisals (Baer, 2003; Bondolfi, 2005; Lynch et al., 2006), metacognitive awareness (Lynch et al., 2006), reperceiving or a shift in perspective (Shapiro et al., 2006), decentering (Bondolfi, 2005; Lau et al., 2006), inhibition of elaborative processing (Bishop, 2002; Bishop et al., 2004), attentional regulation/control (Bishop, 2002; Bishop et al., 2004; Lynch et al., 2006), sustained attention (Bishop, 2002; Bishop et al., 2004), attention-switching (Bishop, 2002; Bishop et al., 2004), bare attention (Bishop, 2002), nondirected awareness (Anderson, Lau, Segal, & Bishop, 2007), and attitudes (Baer, 2003; Bishop, 2002; Bishop et al., 2004; Shapiro et al., 2006).
General Study Limitations

Apart from the problems with measuring mindfulness, there were also recruitment and general study design limitations. One obvious problem with the study was the small sample size. A power analysis based on findings from previous studies suggested that a minimum of 18 participants per group would be necessary to have sufficient power for detecting differences between the groups. This study had slightly more than half the participants needed to detect differences based on this power analysis. If the proposed 40 participants had been attained, it’s possible that additional significant results would have emerged or possibly a clearer image would have emerged regarding the results found. Yet some results were far enough from significance that the addition of 10 participants more in each group is unlikely to have produced significant findings.

Another problem was the stratification process. Although participants were stratified based on meditative practice, the Meditation Practices form developed for this study assessed whether participants currently practiced meditation, and participants were stratified based on frequency and duration of that practice. This measure did not assess whether participants had ever practiced meditation but were currently not practicing. Additionally, the definition of meditation was open to participant interpretation and included such things as yoga, prayer, and birthing relaxation exercises. These forms of meditation are very different from one another and appear qualitatively different from formal practice of meditation. Although participants in this study were stratified according to the quantity of their practice rather than quality, this still introduces a variable of difference. For instance, if one’s meditation practice is short and/or unfocused,
then there would likely be no difference between that person and someone who reports no meditative experience. Likewise, if one has a formal meditation that does not generalize to everyday mindfulness, then that person, too, might be no different than someone who does not meditate.

There was also much variability between participants regarding amount of practice from pretreatment to postpartum. Some participants entered the study with just a few weeks to their estimated due date whereas other participants entered the study with months between the two. This provided the latter group with much more opportunity to practice mindfulness and possibly benefit from it during childbirth.

Additionally, participants varied greatly on their between-session and posttreatment practice. All participants were encouraged to practice at least 45 minutes daily, yet not all participants met this expectation. If it occurred between sessions, this issue was discussed with the participant and they were encouraged again to practice the minimum amount. However, for those that did not practice as requested, it begs the question of how invested these participants were in the training, and if they had to squeeze in the practice due to busy schedules, it is possible that the quality of their practice was affected.

Another important problem with this study may be related directly to the project goals. Generally, other MBSR studies have had participants practice mindfulness when exposed to an ongoing, continuous event, such as chronic pain or generalized anxiety or panic. Participants enter the study already exposed to the outcome of interest. They are able to continuously be exposed to these events and practice mindfulness while in pain or highly anxious. Based on exposure literature, one would expect that this continuous
exposure would likely lead to lower scores for affective responses. This study, however, examined the effect of mindfulness on a discrete event (i.e., childbirth) with a possible confound of the postpartum adjustment period influencing postpartum measures. Participants were not able to practice mindfulness continuously while exposed to childbirth. Instead, they were encouraged to practice mindfulness with auditory and physical distractions with the intent of creating analogues to the childbirth experience, including practicing mindfulness when experiencing any pain, such as a headache. However, none of these analogues come close to what a woman experiences during childbirth. Therefore, the element of exposure is not as strong in this study as it may have been in prior studies.

Anecdotal data suggests that this lack of an appropriate analogue to childbirth may have been a problem. Many of the participants reported that mindfulness was helpful during the initial phases of childbirth. However, when intensity and frequency of contractions increased, participants often reported that they requested medication or were no longer able to be mindful. Participants were given suggestions to practice mindfulness while they had a headache or any other body pain, and they were also encouraged to practice mindfulness with multiple distractions to help build the strength of this skill. However, either this type of practice was not followed, or this type of practice did not strengthen this skill enough to be helpful during latter phases of childbirth.

A final, but more important issue, however, may be related to the cost versus benefit of this training. If a participant is interested in practicing mindfulness for the sole purpose of having a positive childbirth experience, and if 45 minutes of daily practice for weeks is required minimally to produce this result, then it seems that the cost of the
lengthy training may outweigh the benefit provided for such a short experience. This may be of particular concern for participants who have no desire for an unmedicated childbirth. Likewise, if a participant is willing to commit to practicing mindfulness up to 45 minutes daily, that person is likely to be different than other participants that would not make this commitment.

Suggestions for Future Research

It would be beneficial to develop one specific line of research first to determine whether mindfulness truly is beneficial for use during childbirth. This could be accomplished by having a more tightly controlled study, and if results were significant and replicated, then derivations of this line of research could be pursued.

Some of the limitations of this study are fairly easy to correct. For instance, changes in exclusion/inclusion criteria could help to eliminate potential confounds, such as prior childbirth experience, specific type of meditative practice, time between first session and estimated due date, childbirth philosophy, type of delivery expected, care provider, type of childbirth preparation class, etc. Additionally, participants could be dropped from the study if they do not surpass minimal practice expectations. Differences could be calculated between those that complete the study and those that are dropped to determine if there is a difference in participant characteristics.

However, there are some other areas of mindfulness research that still need further development, including clarifying the construct of mindfulness and developing measures that capture these elements, development of other measures that capture the expected outcomes of being mindful (i.e., measures of reactivity or subjective distress related to
various feelings or experiences), clarification of efficacy boundaries (i.e., therapist training, whether therapists need to have their own meditative practice), and investigating whether differences exist between types of mindfulness practice and generalization of skills.

Given the strong support for mindfulness in areas of both physical and psychological health, it seems promising that mindfulness could be just as beneficial to participants in childbirth. It is possible that it could be used as an additional childbirth preparation class or fill in gaps in already existing programs, such as how to cope with pain and/or anxiety when one’s techniques do not seem to be having an effect on them.

An additional benefit of this training is that, as a life skill, mindfulness can be used for the remainder of one’s life whereas most other childbirth skills learned are applicable only to the birthing situation. Also, the extra benefits that might occur from being mindful (i.e., decrease in unpleasant affect, decreased anxiety sensitivity, improved quality of life) may have far-reaching implications beyond just satisfaction with one’s childbirth.
REFERENCES


Bishop, S. R. (2002). What do we really know about Mindfulness-Based Stress Reduction? *Psychosomatic Medicine, 64*, 71-84.


Appendix A

Newspaper Ad
Newspaper Ad

The following newspaper ad will be placed in the WMU Herald newspaper:

Research participants needed!!! Pregnant women 18 years or older who have taken or intend to take a childbirth class. WMU Psychology Department is conducting a research study. Contact Brenda at 269-387-4485 or b2bratto@wmich.edu for more information.

The following newspaper ad will be placed in the Kalamazoo Gazette newspaper:

Recruiting pregnant women 18 years+ for WMU research study. Free training in experimental coping strategy for childbirth. Contact Brenda at 269-387-4485.
Appendix B

Recruitment Flyer
Pregnant Female Participants Needed for Research Study!

If you are a pregnant female over the age of 18 and have previously taken or plan to attend a childbirth preparation class, you are invited to participate in a study investigating an alternative childbirth coping skill.

Your participation would include random assignment to either one 90 minute stress-management program or 4 sessions of mindfulness training lasting 90 minutes each. You will be asked to complete several assessment measures that ask about your fear of childbirth, level of anxiety, obstetric history, basic demographic information, topics covered in your childbirth class, your level of awareness, satisfaction with childbirth, and frequency and duration of practice of techniques taught. All sessions will be conducted individually.

If you are interested in learning more about participating in this study:

Please contact Brenda Bratton
Phone: (269) 387-4485
E-mail: b2bratto@wmich.edu

Please leave your name, phone number or e-mail address, and times you can be reached.

Thank you for your interest!
Appendix C

Brochure
Who can participate?
If you are a pregnant female over the age of 18 and have previously taken or plan to attend a childbirth preparation class, you are invited to participate in a study that will investigate the overall effects of two different training programs for their impact on obstetric outcomes and maternal satisfaction with childbirth. You will be randomly assigned to either a one-session stress-management program or a four-session mindfulness program.

What is stress-management?
The stress-management program will provide you with information about techniques to use for coping with stress, including anxiety-management, breathing, and relaxation techniques along with opportunities to practice both breathing and relaxation techniques. You will also be provided with information regarding how to use these techniques during childbirth. You will be provided with information regarding common reactions to stressful situations and will be offered strategies for minimizing the impact of stress.

What is mindfulness?
Mindfulness is a skill that teaches individuals how to be more aware of moment-to-moment experiences, including various thoughts, feelings, and body sensations. It is learned through practicing different meditation exercises. Research has shown that individuals with health problems who have been trained in mindfulness have reported less anxiety, pain, stress, and medication use.

Although there are currently no studies examining the effects of mindfulness on childbirth, there are two programs in the United States currently practicing this skill. The directors of these programs report positive effects for women's childbirth experiences.

You would be taught the basics of mindfulness and asked to practice this skill. You would be given some suggestions for developing your own mindfulness program and would be encouraged to practice mindfulness daily until childbirth.

What does this study involve?
If you decided to participate in this study, you would be randomly assigned to either a one-session stress-management program or a four-session mindfulness program. All sessions are conducted individually. The one-session group meets once for ~2.5 hours and the four-session group meets weekly with sessions lasting ~2.5 hours for the first session and 90 minutes for subsequent sessions. The four-session group is asked to practice skills 45 minutes daily between sessions and following training. In either program, you would be asked to complete several assessment measures.

Sessions are conducted at either Kalamazoo or Grand Rapids. To learn more about this study, please contact Brenda Bratton.

Phone: (269) 387-4485
E-mail: b2bratto@wmich.edu
Appendix D

Participant Contact Script
Telephone Contact Script: Initial Contact
(after receiving e-mail or telephone message)

1. When someone answers say, "Hello. May I speak with ___________ please?"
   - If you are speaking with the correct person, proceed to number 3.
   - If the person who answered the phone goes to get the participant you asked for, say "Thank you," and proceed to step 2 when the person comes to the phone.
   - If the participant is not there, say "Thank you. I'll call back another time. Goodbye."

2. Once the person is on the phone say, "Is this _______?" (If it is not the participant you need to speak with, again ask for that person.)

3. If so, say, "Hello _______. This is Brenda Bratton from Western Michigan University's Psychology Department. I received your message regarding my project of mindfulness in childbirth. Thank you for your interest in this study. I'd like to provide you with some more information about this study. If you decided to participate in this study, you would be assigned to either a stress-management program or a mindfulness training program. The stress management program would provide you with information typical for an anxiety-management program. You will be provided with information regarding common reactions to stressful situations and will be offered strategies for minimizing the impact of stress. For example, you will be provided with an explanation about anxiety/stress, including the biological, cognitive, and behavioral components, the benefits of anxiety, consequences of high levels of anxiety, and factors that can influence the experience of anxiety. Additionally, you will be given instruction about breathing and relaxation techniques which are commonly used behavioral techniques for addressing stress and anxiety. Specifically, breathing techniques will focus on hyperventilation and techniques to control/prevent hyperventilation. You will also have an opportunity to practice different breathing exercises. You will also be introduced to relaxation, including why relaxation may be beneficial, variations of relaxation training, and will be given an opportunity to practice relaxation. However, you may be assigned to a mindfulness training program. Mindfulness is a skill that teaches individuals how to be more aware of moment-to-moment experiences, including various thoughts, feelings, and body sensations. It is a type of meditative practice and is learned through practicing different meditation exercises. Research has shown that individuals with health problems who have been trained in mindfulness have reported less anxiety, pain, stress, and medication use. There are currently no studies examining the effects of mindfulness on childbirth. However, there are two programs in the United States that currently are practicing this skill, and these reports are positive regarding women's childbirth experiences. If you decided to participate in this study, you would be randomly assigned to either the one-session stress management program or the four-week mindfulness training program. All sessions are conducted individually. Participants in the one-
session group meet for 2.5 hours, and participants in the four-week group meet for an initial 2.5 hour session with subsequent sessions lasting approximately 90 minutes each. In the mindfulness program, you would be taught the basics of mindfulness including a new mindfulness skill each week. You would be given opportunities to practice these skills within-session and would be asked to practice the skills 45 minutes daily between-sessions. You would also be given some suggestions for developing your own mindfulness program and asked to practice daily for 45 minutes until at least childbirth. Participation in both groups would also include completing several assessment measures that ask about your fear of childbirth, obstetric history, topics covered in childbirth classes, basic demographic information, your level of awareness practicing mindfulness, your level of anxiety, your satisfaction with childbirth, your childbirth experience, and frequency and duration of practice of techniques taught. Finally, you would be eligible for a random drawing of one of two $50 gift cards to a local store. Are you still interested in learning more about participating in this study?

4. If they say no, say, “Okay. Thank you for your time. Goodbye.”

5. If they answer yes, say, “There are several requirements for participation in this study. One requirement is that you must be pregnant and at least 18 years or older. Do you meet this requirement?”

6. If they answer no, say, “I’m sorry but you must be pregnant and at least 18 years old to participate in this study. However, thank you for your interest in this study.”

7. If they answer yes, continue with number 8.

8. Then say, “Another requirement of this study is that you need to be either currently enrolled in a childbirth preparation class or you need to have taken a class previously. Are you currently enrolled in a childbirth preparation class or have you taken one previously?”

9. If they answer no, say, “Do you intend to take a childbirth preparation class before your due date?”

   a. If they say no, then say, “I’m sorry, but attendance in a childbirth preparation class is a requirement for participation in this study. I’m not going to be able to assign you to either group. However, thank you for your interest in this study.”

   b. If they say yes, then say, “Okay. That is one topic that will be assessed during this study.”
10. Then say, "A second requirement for participation in this study is that you need to be available for participation in either program, as you will be randomly assigned to one of the two. Are you able to participate in either the one-session stress-management program which meets once for about 2.5 hours or the four-week mindfulness program which meets for an initial 2.5 hour session and 90 minute sessions for the subsequent three weeks?"

11. If they answer no, then say, "I'm sorry, but participation in this study requires that you be available to meet for both the one-session program and the four-week program so that we can randomly assign you to either one. Unfortunately, this excludes you from participation in this study. However, thank you for your interest in this study."

12. If they say yes, then say, "Good. You meet all requirements for participation in this study. Before I can assign you to a program, I will need to meet with you for an initial session. The first part of this session should take about 45 minutes to complete. You will be asked to read and sign an informed consent form for participation in this study. Also during this session you will be asked to complete a demographic form asking about basic information about you and your obstetric history. You will also be asked to complete several other measures asking about your experience practicing meditation, your fear of childbirth, your level of anxiety, your level of awareness, and topics covered in your childbirth class if you have already taken this class. Do you have any questions or concerns for me?"

13. If yes, answer all questions and concerns, and then skip to number 15.

14. If no, then proceed to number 15.

15. Then say, "Once these forms have been completed, you will be assigned to either the one-session stress-management program or the four-session mindfulness program based on your responses to the assessment measures and assignment of previous participants. The stress management program consists of only one session and would follow the completion of the assessment measures. Therefore, if you are assigned to this program, this initial meeting would be our only session. However, if you are assigned to the four-session mindfulness program, this initial meeting would be our first mindfulness session which would follow the completion of the assessment measures. There would be three sessions staggered one week apart following this initial session. Do you have any questions for me regarding assignment to conditions or number of meeting times?"

16. If yes, then answer all questions and skip to number 18.

17. If no, then proceed to number 18.

18. Schedule the participant for the initial session.
19. After the participant is scheduled for the initial session, say, "Okay. I will contact you 1-2 nights prior to our session to remind you of the date, time, and location. What is your preferred method of contact: telephone, cell phone, or e-mail?" (Record this information on the master list). Then say, "Okay. Thank you for your interest in this study. I'll be in touch soon. Goodbye."

**E-mail Contact Script: Initial Contact**

(after receiving e-mail or telephone message)

Subject: mindfulness in childbirth study

Hi __________________. My name is Brenda Bratton, and I am a graduate student in Western Michigan University's Psychology Department. I am responding to your message indicating your interest in my project of mindfulness in childbirth. Thank you for your interest in this study. I'd like to provide you with some more information about this study.

If you decided to participate in this study, you would be assigned to either a one-session stress-management program or a four-session mindfulness training program. The stress management program would provide you with information typical for an anxiety-management program. You will be provided with information regarding common reactions to stressful situations and will be offered strategies for minimizing the impact of stress. For example, you will be provided with an explanation about anxiety/stress, including the biological, cognitive, and behavioral components, the benefits of anxiety, consequences of high levels of anxiety, and factors that can influence the experience of anxiety. Additionally, you will be given instruction about breathing and relaxation techniques which are commonly used behavioral techniques for addressing stress and anxiety. Specifically, breathing techniques will focus on hyperventilation and techniques to control/prevent hyperventilation. You will also have an opportunity to practice different breathing exercises. You will also be introduced to relaxation, including why relaxation may be beneficial, variations of relaxation training, and will be given an opportunity to practice relaxation.

However, you may be assigned to the four-session mindfulness training program. Mindfulness is a skill that teaches individuals how to be more aware of moment-to-moment experiences, including various thoughts, feelings, and body sensations. It is a type of meditative practice and is learned through practicing different meditation exercises. Research has shown that individuals with health problems who have been trained in mindfulness have reported less anxiety, pain, stress, and medication use. There are currently no studies examining the effects of mindfulness on childbirth. However, there are two programs in the United States that currently are practicing this skill, and these reports are positive regarding women's childbirth experiences.
If you decided to participate in this study, you would be randomly assigned to either the one-session stress-management program or the four-session mindfulness program. All sessions are conducted individually. Participants in the one-session group meet for 2.5 hours, and participants in the four-week group meet for an initial 2.5 hour session with subsequent sessions lasting approximately 90 minutes each. In the mindfulness program, you would be taught the basics of mindfulness including a new mindfulness skill each week. You would be given opportunities to practice these skills within-session and would be asked to practice the skills 45 minutes daily between-sessions. You would also be given some suggestions for developing your own mindfulness program and asked to practice daily for 45 minutes until at least childbirth. Participation in both programs would also include completing several assessment measures that ask about your fear of childbirth, obstetric history, topics covered in childbirth classes, basic demographic information, your level of awareness practicing mindfulness, your level of anxiety, your satisfaction with childbirth, your childbirth experience, and frequency and duration of practice of techniques taught. Finally, you would be eligible for a random drawing of one of two $50 gift cards to a local store.

There are several requirements for being eligible to participate in this study. One requirement is that you must be pregnant and at least 18 years or older. A second requirement is that you need to have either taken a childbirth preparation class or intend on taking this type of class before you give birth. This study is not intended to substitute for childbirth preparation classes. Therefore, we will be asking you questions regarding your childbirth class experience. Finally, you would need to be available to participate in either the one-session stress-management program that meets once for about 2.5 hours or the four-session mindfulness program that meets initially for 2.5 hours and 90 minutes for the three subsequent sessions. Are you able to meet all three of these requirements?

If you do not meet all three of these requirements: you are ineligible for participation in this study. However, I would like to thank you for your interest in this study and wish you the best with your upcoming labor and delivery. If you have any questions regarding this, please feel free to contact me.

If you are able to meet all three of these requirements: I would like to schedule you for an initial session which should take about 2.5 hours to complete. During this session, you will be asked to read and sign an informed consent form for participation in this study. Also during this session you will be asked to complete a demographic form asking about basic information about you and your obstetric history. You will also be asked to complete several other measures asking about your experience practicing meditation, your fear of childbirth, your level of anxiety, and your level of awareness. Additionally, you will be asked to complete a childbirth class assessment form if you have already taken a childbirth class. This first portion of the session will take about 45 minutes to complete. Following this portion, you will be assigned to either the one-session stress-management program or the four-session mindfulness program based on your responses to the assessment measures and assignment of previous participants. The stress-management
program consists of only one session and would follow the completion of the assessment measures. Therefore, if you are assigned to this program, this initial meeting would be our only session. However, if you are assigned to the four-session mindfulness program, this initial meeting would be our first mindfulness session which would follow the completion of the assessment measures. There would be three sessions staggered one week apart following this initial session.

If you are still interested in participating in this study, please provide me with your availability for the initial session (~2.5 hours). Also, please include your preferred method of contact: telephone, cell phone, or e-mail. If you have any questions or concerns, please either call me at 387-4485 or e-mail me at b2bratto@wmich.edu. Once I receive your availability for the initial session, I will contact you to schedule this session.

Thank you for your interest in this study!

Brenda

E-mail Contact Script: Scheduling Initial Session at Unified Clinics
(follow-up to previous e-mail message for preferred e-mail contact)

Subject: mindfulness in childbirth study

Hi ______________. I have you scheduled on ______________ at ______________ for your initial session. We will be meeting at the Unified Clinics. The address is 3rd floor, 1000 Oakland Drive, Kalamazoo. It is located on the east campus of Western Michigan University. Please park anywhere in the parking lot and enter the building through the double doors marked “Patient Entrance.” Ride the elevator up to the 3rd floor, check in at the front desk, and have a seat. I will escort you back to our meeting room at _____________. Also, I will contact you 1-2 nights prior to your session to remind you of the session and to provide you, again, with the address and driving directions if needed. In the meantime, please let me know if you have any questions or concerns or need driving directions by contacting me at 387-4485 or at b2bratto@wmich.edu.

Sincerely,

Brenda
E-mail Contact Script: Scheduling Initial Session at Wood Hall
(follow-up to previous e-mail message for preferred e-mail contact)

Subject: mindfulness in childbirth study

Hi __________. I have you scheduled on ________ at ________ for your initial session. We will be meeting on the WMU campus at Wood Hall. The address is 2500 Wood Hall. It is located on the west campus of Western Michigan University. Since we are meeting on a Saturday, you may park anywhere in the parking lots. I will greet you at the north entrance of Wood Hall, which is located northwest of the Waldo Library building. If you need specific directions for parking and for Wood Hall, please let me know. Also, I will contact you 1-2 nights prior to your session to remind you of the session and to provide you with the address and driving directions if needed. In the meantime, please let me know if you have any questions or concerns or need driving directions by contacting me at 387-4485 or at b2bratto@wmich.edu.

Sincerely,

Brenda

Telephone Contact Script: Scheduling Initial Session at Unified Clinics
(follow-up to previous e-mail for preferred telephone contact)

1. When someone answers say, "Hello. May I speak with _______________ please?"
   • If you are speaking with the correct person, proceed to number 3.
   • If the person who answered the phone goes to get the participant you asked for, say "Thank you," and proceed to step 2 when the person comes to the phone.
   • If the participant is not there, say "Thank you. I'll call back another time. Goodbye."

2. Once the person is on the phone say, "Is this _________?" (If it is not the participant you need to speak with, again ask for that person.)

3. If so, say, "Hello _______. This is Brenda Bratton from Western Michigan University's Psychology Department. I received your message regarding your availability for the initial session. I have you scheduled for ________ at _________. Will that day and time still work for you?"
4. If no, reschedule for another date and time. Then proceed to number 6.

5. If yes, proceed to number 6.

6. Then say, "We will be meeting at the Unified Clinics. The address is 3rd floor, 1000 Oakland Drive, Kalamazoo. It is located on the east campus of Western Michigan University. Please park anywhere in the parking lot and enter the building through the double doors marked Patient Entrance. Ride the elevator up to the 3rd floor, check in at the front desk, and have a seat. I will escort you back to our meeting room at __________. Also, I will contact you 1-2 nights prior to your session to remind you of the session and to provide you, again, with the address and driving directions if needed. Do you have any questions or concerns?"

7. If yes, answer questions and concerns.

8. If no, proceed to number 9.

9. Then say, "Okay. I will be in touch 1-2 nights before your scheduled session. Have a good day/night. Goodbye."

**Telephone Contact Script: Scheduling Initial Session at Wood Hall**
(follow-up to previous e-mail for preferred telephone contact)

1. When someone answers say, "Hello. May I speak with _______________ please?"
   - If you are speaking with the correct person, proceed to number 3.
   - If the person who answered the phone goes to get the participant you asked for, say "Thank you," and proceed to step 2 when the person comes to the phone.
   - If the participant is not there, say "Thank you. I'll call back another time. Goodbye."

2. Once the person is on the phone say, "Is this __________?” (If it is not the participant you need to speak with, again ask for that person.)

3. If so, say, "Hello _______. This is Brenda Bratton from Western Michigan University's Psychology Department. I received your message regarding your availability for the initial session. I have you scheduled for _________ at __________. Will that day and time still work for you?"
4. If no, reschedule for another date and time. Then proceed to number 6.

5. If yes, proceed to number 6.

6. Then say, "We will be meeting at the Wood Hall suite 2500. It is located on the west campus of Western Michigan University. Since we will be meeting on Saturday, please feel free to park anywhere in the parking lot. I will meet you at the north entrance to Wood Hall. Also, I will contact you 1-2 nights prior to your session to remind you of the session and to provide you, again, with the address and driving directions if needed. Do you have any questions or concerns?"

7. If yes, answer questions and concerns.

8. If no, proceed to number 9.

9. Then say, "Okay. I will be in touch 1-2 nights before your scheduled session. Have a good day/night. Goodbye."

**E-mail Contact Script: Reminder Message and Driving Directions**

(follow-up to previous e-mail message or initial phone contact for preferred e-mail contact)

Subject: mindfulness in childbirth study

Hi _______________. I am writing to remind you that your initial session is scheduled for _________ at ________ at the Unified Clinics. This will take about 2.5 hours. During this session, you will be asked to read and sign an informed consent form for participation in this study. Also during this session you will be asked to complete a demographic form asking about basic information about you and your obstetric history. You will also be asked to complete several other measures asking about your experience practicing meditation, your fear of childbirth, your level of anxiety, your level of awareness, and topics covered in your childbirth class if you’ve already taken this class. You also will be assigned to either the one-session stress-management program or the four-session mindfulness program, and our first session will follow completion of the assessment measures.
The address for this session is (Insert address, driving and parking directions if applicable.)

(For participants meeting at Unified Clinics): Enter the building through the main double doors marked “Patient Entrance” and ride the elevator up to the 3rd floor. Please sign in at the front desk and have a seat. I will come and greet you at _______ and escort you to our room. Please let me know if you have any questions and remember to wear comfortable clothing.

(For participants meeting at Wood Hall): I will meet you at the north entrance to Wood Hall. Please let me know if you have any questions and remember to wear comfortable clothing.

I look forward to meeting you.

Brenda

**Telephone Contact Script: Reminder Call for Initial Session**

(follow-up to initial telephone contact for preferred telephone contact)

1. When someone answers say, "Hello. May I speak with _______________ please?"
   - If you are speaking with the correct person, proceed to number 3.
   - If the person who answered the phone goes to get the participant you asked for, say "Thank you," and proceed to step 2 when the person comes to the phone.
   - If the participant is not there, say "Thank you. I’ll call back another time. Goodbye."

2. Once the person is on the phone say, “Is this _______?” (If it is not the participant you need to speak with, again ask for that person.)

3. If so, say, "Hello, _______________. This is Brenda Bratton from Western Michigan University’s Psychology Department. I’m calling to remind you that your initial session is scheduled for _______ at _______. This session will take about 2.5 hours to complete. During this session, you will be asked to read and sign an informed consent form for participation in this study. Also during this session you will be asked to complete a demographic form asking about basic information about you and your obstetric history. You will also be asked to complete several other measures asking about your experience practicing meditation, your fear of childbirth, your level of
anxiety, your level of awareness, and topics covered in your childbirth class if you've already taken that class. Do you have any questions for me?"

4. If yes, answer questions and then skip to number 6.

5. If no, proceed to number 6.

6. Then say, “Following this portion of the session, you will be assigned to either the one-session stress-management program or the four-session mindfulness program. If you are assigned to the stress-management program, this will be our only session and this portion of the session will take about 90 minutes. If you are assigned to the mindfulness program, this portion of the session will also take about 90 minutes to complete. However, there will be three sessions staggered one week apart that will follow this session. Do you have any questions for me?”

7. If yes, answer questions then skip to number 9.

8. If no, then proceed to number 9.

9. Then say, “We will meet at (Insert location and address). Do you need driving directions there?”

   a. If they say no, then skip to number 10.

   b. If they say yes, then provide directions as needed. Proceed to number 10.

10. Then for meeting at the Unified Clinics, say, “You may park anywhere in the parking lot. Enter the building through the main double doors marked Patient Entrance and ride the elevator up to the 3rd floor. Please sign in at the front desk and take a seat. I will come out and greet you at ______ and escort you back to our room. Do you have any questions for me?”

For meeting at Wood Hall, say, “You may park anywhere in the parking lots. I will meet you at the north entrance to Wood Hall. Do you have any questions for me?”

   a. If they say yes, answers questions, then skip to number 8.

   b. If they say no, then proceed to number 8.

11. To end the phone call, say, “Okay. Remember to wear comfortable clothing, and I will see you on ______ at ______. Have a good day/evening.”
Telephone Contact Script: Reminder Call for Subsequent Sessions

1. When someone answers say, "Hello. May I speak with ________________ please?"
   - If you are speaking with the correct person, proceed to number 3.
   - If the person who answered the phone goes to get the participant you asked for, say "Thank you," and proceed to step 2 when the person comes to the phone.
   - If the participant is not there, say "Thank you. I'll call back another time. Goodbye."

2. Once the person is on the phone, say, "Is this __________?" (If it is not the participant you need to speak with, again ask for that person.)

3. If so, say, "Hello, _________________. This is Brenda Bratton from Western Michigan University’s Psychology Department. I’m calling to remind you of our session on __________ at ________. If you don’t have any questions for me, I’ll see you on __________ at ________."

4. If participant has questions, answer all questions and then skip to number 6.

5. If the participant doesn’t have questions, proceed to number 6.

6. Then say, "Have a good day/evening."

E-mail Contact Script: Reminder Message for Subsequent Sessions

Subject: mindfulness in childbirth study

Hi _________________. I am writing to remind you that our next session is scheduled for __________ from ________ to ________. If you have any questions or concerns, please let me know. Otherwise, I’ll see you on __________ at _________.

Have a good day/evening,

Brenda
Appendix E

Inclusion/Exclusion Criteria Checklist
Inclusion/Exclusion Criteria Checklist

1) Are you at least 18 years old?  Yes  No
   • If no, exclude from participation.
   • If yes, continue with question 2.

2) Are you currently pregnant?  Yes  No
   • If no, exclude from participation.
   • If yes, continue with question 3.

3) Have you previously taken a childbirth preparation class?  Yes  No
   • If no, inquire whether the person intends to take this class.
     ○ If no, exclude from participation.
     ○ If yes, continue with question 4.
   • If yes, continue with question 4.

4) Are you able to commit to participating in either the one-session condition or the four-week condition?  Yes  No
   • If no, exclude from participation.
   • If yes, continue with question 6.
Appendix F

Master Contact List
## Master Contact List

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<th>ID#</th>
<th>Name</th>
<th>Phone #</th>
<th>E-mail</th>
<th>Preferred Contact</th>
<th>Mailing Address</th>
<th>Group assigned C or I</th>
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Appendix G

Consent Document
Western Michigan University
Department of Psychology

"Mindfulness in Childbirth: An Investigation of the Effects of Mindfulness Training on Maternal Satisfaction with Childbirth and Obstetric Outcomes"

Principal Investigator: Amy E. Naugle, Ph.D.
Student Investigator: Brenda L. Bratton, M.A.

You have been invited to participate in a research project entitled "Mindfulness in Childbirth: An Investigation of the Effects of Mindfulness Training on Maternal Satisfaction with Childbirth and Obstetric Outcomes." This project is part of Brenda Bratton’s dissertation project and is supervised by Dr. Amy Naugle. This research is intended to investigate the overall effects of two different training programs for their impact on obstetric outcomes and maternal satisfaction with childbirth. You will be assigned to either a one-session stress-management program or a four-session mindfulness program. During the first session for either group, you will be asked to read and sign an informed consent form. You will also be asked to complete a demographic form asking about basic information about yourself and your obstetric history and a meditation practices form asking about your experience practicing meditation. Additionally, if you have taken a childbirth preparation class prior to the pre-treatment session, you will be asked to complete an assessment form that asks about topics covered in this class. If you have not taken this class prior to the pre-treatment session, then you will be asked to complete this form postpartum. During the initial session, you will also be asked to complete several assessment measures that ask about your fear of childbirth, your level of anxiety, and your level of awareness. This portion of the study will take approximately 45 minutes. You will have an opportunity to ask any questions or concerns you have regarding participation in this study. Following this portion of the session, you will be assigned to either a one-session stress-management program or a four-week mindfulness program. This assignment will be determined based on information provided on your assessment measures and rotation of participant assignments. You have equal chance of being assigned to each program. A coin toss will determine whether the first participant receives the stress-management program or the four-week mindfulness program. Depending on which program you are assigned, one of the two following procedures will occur.

**One-Session Stress-Management Program (Total time commitment ~2.5 hours):** If you agree to participate, once you have completed the paper and pencil measures, you will be asked to continue with the 90 minute stress-management program. During this program, you will be provided with information about techniques to use for coping with stress, including anxiety-management, breathing, and relaxation techniques along with opportunities to practice both breathing and relaxation techniques. You will also be provided with information regarding how to use these techniques during childbirth. The information used in this training program has been taken and adapted from typical anxiety-management programs. You will be provided with
information regarding common reactions to stressful situations and will be offered strategies for minimizing the impact of stress. You will be given instruction about breathing and relaxation techniques which are commonly used behavioral techniques for addressing stress and anxiety. There will also be a brief discussion regarding how to incorporate these activities into childbirth. At the end of the session, you will be asked to complete an assessment measure that assesses your level of awareness following training. You will also be asked to complete an evaluation form asking about your experience and perspectives on this program. There will be a 10-minute break partway through this session. At the end of the session, you will be provided with two business cards that have the student investigator’s telephone number. You will be asked to contact the researcher following childbirth while still in the hospital. The purpose for this is twofold: to allow you an opportunity to discuss the birthing experience with your program trainer and to complete postpartum assessment measures. These assessment measures ask about your fear of childbirth, level of anxiety, level of awareness, satisfaction with childbirth, your labor and delivery experience, and your frequency and duration of practice of techniques taught. Additionally, if you have not taken a childbirth preparation class prior to this session, then you will also be asked to complete the Childbirth Preparation Class Assessment form. One week prior to your estimated due date, you will be mailed a Withdrawal of Consent form. If, after childbirth, you decide that you do not want to continue participating in the study, then you will be asked to sign and return that form to the researcher. You will be provided with a self-addressed postage paid envelope in which you may return this form. If this form is not received one week following your estimated due date and you have not contacted the researcher, the researcher will attempt to contact you to determine whether you would like to continue participating in the study. This session will be videotaped so that the researchers can later watch them and rate whether they accurately followed the study protocol.

Four Session Mindfulness Program (Total in-session time commitment ~7 hours; additionally 45 minutes of daily mindfulness practice): If you agree to participate, once you have completed the paper and pencil measures, you will be asked to continue with the first 90 minute mindfulness training session. You will then meet for three more weekly sessions lasting about 90 minutes each. You will be taught the basics of mindfulness including how to use mindfulness in childbirth and how to practice a variety of meditation exercises. The mindfulness training used in this project has been adapted from the mindfulness-based stress reduction program. In this project, you will be trained in several meditation exercises and the body scan. These techniques aim to increase your awareness of moment-to-moment experiences, including body sensations, while detaching oneself from thoughts and feelings associated with those experiences. These strategies are hypothesized to help a laboring woman minimize any fear or anxiety associated with pain and complications and to be more adaptive to whatever circumstances arise. You will also be asked to participate in several meditation exercises and to discuss your experiences during these exercises. At the end of each session, you will be given several homework exercises asking you to practice certain meditation exercises for up to 45 minutes daily. You will be provided with a guided meditation tape
that you may choose to use to help you practice these mediation exercises. You will be asked to complete a daily meditation log recording your frequency and duration of practice for each meditation exercise. At the beginning of each session, you will be asked to share your meditation experiences and to turn in your meditation log to the student investigator. During each session, a new meditation exercise will be introduced and practiced within-session. During the final session, you will be provided with some suggestions for developing your own mindfulness practice and will be asked to practice mindfulness daily for 45 minutes until at least childbirth. You will also be asked to complete the KIMS, an assessment measure asking about your level of awareness practicing mindfulness. You will also be asked to complete an evaluation form asking about your experience and perspectives on this program. There will be a 10 minute break partway through each session. All sessions will be videotaped so that the researchers can later watch them and rate whether they accurately followed the study protocol.

After you have completed all four mindfulness sessions, you also will be provided with two business cards that have the student investigator’s telephone number. You will be asked to contact the researcher following childbirth while still in the hospital. The purpose for this is twofold: to allow you an opportunity to discuss the birthing experience with your program trainer and to complete postpartum assessment measures. These assessment measures ask about your fear of childbirth, level of anxiety, level of awareness, satisfaction with childbirth, your labor and delivery experience, and frequency and duration of practice of techniques taught. Additionally, if you have not taken a childbirth preparation class prior to the initial session, then you will also be asked to complete the Childbirth Preparation Class Assessment form. One week prior to your estimated due date, you will be mailed a Withdrawal of Consent form. If, after childbirth, you decide that you do not want to continue participating in the study, then you will be asked to sign and return that form to the researcher. You will be provided with a self-addressed postage paid envelope in which you may return this form. If this form is not received one week following your estimated due date and you have not contacted the researcher, the researcher will attempt to contact you to determine whether you would like to continue participating in the study.

If you are placed on bedrest during the training period, you will not be allowed to continue participation in the study. This is a precautionary measure for both your safety and the baby’s safety as the final meditative exercise requires physical activity. However, if you are placed on bedrest following the training period, you will be allowed to continue participating in the study only if your physician/midwife agrees that it is okay to continue with at least the non-physical meditative exercises (i.e. mindfulness of breathing, body scan, sitting with sound, and sitting with thoughts and feelings) as these activities may be practiced either lying down or sitting.

Potential Risks
As in all research, there may be unforeseen risks to the participant. One potential risk of participation in this project is that participants may experience some anxiety and/or discomfort responding to self-report measures that inquire about participants’ fears, anxiety, and expectations of childbirth. This risk will be monitored by the
researcher by assessing changes in distress throughout all assessment periods. Another
potential risk of participation in this project is that you may initially experience some
discomfort while participating in either the stress-management or meditative exercises. It
is likely that once you become more experienced in this practice, your level of discomfort
will diminish. However, if you find yourself becoming too anxious or uncomfortable with
the exercises, you may stop them at any time. In addition, the researcher is prepared to
provide crisis counseling and will have referral and resource information available. If you
choose to pursue additional services, you will be responsible for all costs incurred.

Benefits

There are some potential benefits from participation in this project. One potential
benefit is training in and refinement of one of two life skills, stress-management or
mindfulness. Either skill may be applied to a variety of life circumstances where one
wishes to enhance their experience. By using these skills in childbirth, you may be more
able to adapt to your childbirth experience as it unfolds, resulting in a positive experience.
Furthermore, other pregnant women may benefit from the knowledge that is gained from
this research. If you are interested in receiving a general summary of study results, you
may contact either Brenda Bratton or Dr. Amy Naugle at (269) 387-4485. We will
provide you with this information once the study is completed.

Confidentiality Issues

All of the information collected from you is confidential. This means that your
name will not appear on any papers or assessment measures that are collected from you.
All forms will be coded, and the researcher will keep a separate master list with the
names of participants and their contact information. All forms will be retained for at least
three years in a locked file in the principal investigator's office. The videotapes of your
sessions will be kept in a locked cabinet and will be destroyed once they are reviewed by
the researchers. Once the data are collected and analyzed, the master list will be
destroyed. There is, however, some information that cannot legally be kept confidential.
This includes information that must be reported to the proper authorities, such as if you
are in danger of harming either yourself or someone else or if you report having
knowledge that a child or vulnerable adult is currently being abused or neglected.

Your participation in this project is completely voluntary. You may refuse to
participate or may withdraw from this study at any time for any reason without prejudice
or penalty. Following the training sessions, you may still withdraw from the study, if you
choose. This may be done by either signing and returning the withdrawal of consent form
which will be mailed out to you one week prior to your estimated due date or by
informing the researcher if she contacts you by telephone that you wish to withdraw from
participating in the study. You also may refuse to answer any of the questions in any of
the assessment forms. If you decide to discontinue participation in the study, the
following protocol will be followed. If you inform the investigator of the decision to
discontinue during a session or by phone or e-mail, you will be allowed to discontinue
without any repercussions. If you do not show up for a scheduled session, the investigator
will attempt once to contact you and leave a message via phone or e-mail to reschedule
the missed session. If you do not respond within one week, you will be sent a brief letter
stating that your lack of attendance is assumed to indicate that you are discontinuing the project. However, you will be informed that if this is not your intent, you should contact the investigator within one week of the date of the letter to reschedule your next session.

If you have any questions or concerns about this study, you may contact either Dr. Amy Naugle at (269) 387-4726 or Brenda Bratton at (269) 387-4485. You may also contact the chair of Human Subjects Institutional Review Board at (269) 387-8293 or the vice president for research at (269) 387-8298 if questions or problems arise during the course of this study. You will be given a copy of this consent form to keep for your records.

This consent document has been approved for use for one year by the Human Subjects Institutional Review Board (HSIRB) as indicated by the stamped date and signature of the board chair in the upper right corner. Do not participate in this study if the stamped date is more than one year old. Your signature below indicates that you have read and/or had explained to you the purpose and requirements of the study and that you agree to participate.

__________________________
Signature

__________________________
Date

Consent obtained by: ____________________________ ____________________________
initials of researcher Date
Appendix H

Flow Chart of Procedures and Assessment Measures
Pretreatment Assessment Measures

- Meditation Practices Assessment form
- Demographic Information Questionnaire
- Childbirth Preparation Class Assessment form (only if completed class prior to session 1)
- STAI
- WDEQ-A
- KIMS

Assignment to Treatment Group

Stress-Management Group
- Post-treatment Assessment Measures
  > KIMS
  > Post-program Evaluation form Version B

Mindfulness Group
- Session 1
  > NONE
- Session 2
  > NONE
- Session 3
  > NONE
- Session 4 (Post-treatment Assessment)
  > KIMS
  > Post-program Evaluation form Version A

Postpartum Assessment Measures

Stress-Management Group
- Postpartum Assessment Measures
  > Childbirth Preparation Class Assessment form (only if not completed at session 1)
  > STAI
  > WDEQ-B
  > KIMS
  > KMSQ
  > Labor and Delivery Assessment form
  > Stress-Management Practice Assessment form

Mindfulness Group
- Postpartum Assessment Measures
  > Childbirth Preparation Class Assessment form (only if not completed at session 1)
  > STAI
  > WDEQ-B
  > KIMS
  > KMSQ
  > Labor and Delivery Assessment form
  > Post-program Mindfulness Practice Assessment form
Demographic Information Questionnaire

DIRECTIONS: For each question below either circle the response that best describes you or fill in the appropriate blank.

1. What is your age? ________ years

2. What is your relationship status?
   1 Single and NOT involved in a dating relationship
   2 Single and currently dating / in a relationship or Engaged
   3 Living with a committed partner
   4 Married
   5 Separated / Divorced
   6 Widowed

3. What best describes your race / ethnicity?
   1 Asian / Pacific Islander
   2 African American
   3 Hispanic / Latino
   4 Native American
   5 White / Caucasian
   6 Other

4. What best describes your occupation?
   1 Professional / Technical
   2 Management
   3 Sales / Marketing
   4 Clerical / Service Worker
   5 Trades / Laborer / Machine Operator
   6 Full-time Homemaker
   7 Retired
   8 Full-Time Student
   9 Unemployed
   10 Disabled

5. What is your religion?
   1 Catholic
   2 Protestant / Lutheran
   3 Jewish
   4 Other: ____________
   5 None

6. What is your current yearly income?
   1 $15,000 or less
   2 $15,001 - $25,000
   3 $25,001 - $35,000
   4 $35,001 - $50,000
   5 Over $50,000

7. What is your level of education?
   1 Completed some high school
   2 GED
   3 High school diploma
   4 Completed some college
   5 Associates Degree
   6 Bachelors Degree
   7 Masters Degree
   8 Doctorate

Obstetric History

8. What is your due date? ____________________________
   (month/day/year)
9. Who is providing your obstetric care?

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<th>Obstetrician</th>
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<th>Family Physician/GP</th>
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<tr>
<td>1</td>
<td>Midwife</td>
<td>3</td>
<td>Other</td>
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10. Do you have any current pregnancy complications? Y or N
   a) If so, please describe them:

11. Have you given birth previously? Y or N
    If not, please stop. You do not need to complete the rest of the questionnaire.
   a) If so, how did you deliver (please indicate for each delivery)?

   b) How long was your labor and delivery experience for each birth?

   c) During previous deliveries, did you experience any complications? Y or N
      If yes, please describe what they were.

   d) Were any of the following medical interventions used during previous deliveries?
      i. Induction of labor? Y or N
         1. If yes, how was labor induced?

      ii. Augmentation of labor (help progressing labor)? Y or N
          If yes, how was labor augmented (how did they help speed up the labor process)?
iii. Episiotomy? Y or N
iv. Fetal monitoring (monitoring the unborn baby)? Y or N
v. Vacuum extraction (use of a vacuum/suction to deliver the baby)? Y or N
vi. Forceps? Y or N
vii. Other: _________________________________________________________________

  e) Did you use any medication during previous deliveries? Y or N
  f) If so, please indicate what medications were used for each delivery:
     ____________________________________________________________
     ____________________________________________________________
Meditation Practices Assessment

1) Do you currently practice any form of meditation? Yes No
   • If No, then stop.
   • If Yes, then continue with number 2.

2) What type of meditation do you practice?

3) How often do you practice meditation?

<table>
<thead>
<tr>
<th>a) Everyday</th>
<th>b) 3 times/week</th>
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<tr>
<td>c) Once per week</td>
<td>d) Once per month or less</td>
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4) During each practice session, how long do you practice your meditation?

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<tr>
<th>a) Longer than 1.5 hours</th>
<th>b) 1-1.5 hours</th>
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<tr>
<td>c) 30-59 minutes</td>
<td>d) Less than 30 minutes</td>
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</table>
Childbirth Preparation Class Assessment Form

1. How many childbirth preparation classes have you taken? ________

2. How many hours have been spent in childbirth preparation classes?

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<th>Hours</th>
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<td>1-5 hours</td>
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<td>16-20 hours</td>
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<td>6-10 hours</td>
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<td>21-25 hours</td>
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<tr>
<td>11-15 hours</td>
<td>3</td>
<td>Over 25 hours</td>
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3. How much time was spent discussing signs of labor?

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<th>Minutes</th>
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<td>16-30 minutes</td>
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<td>More than 2 hours</td>
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4. How much time was spent discussing process of labor and birth?

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5. How much time was spent discussing early postpartum issues?

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6. How much time was spent discussing birth positions?

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7. How much time was spent practicing birthing positions?

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8. How much time was spent discussing massage techniques?

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9. How much time was spent practicing massage techniques?

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10. How much time was spent discussing relaxation techniques?

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12. How much time was spent discussing breathing?

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14. How much time was spent discussing comfort measures?

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15. How much time was spent practicing comfort measures (i.e. relaxation, breathing, massage, etc.)?

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16. How much time was spent discussing pushing exercises?

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17. How much time was spent practicing pushing exercises?

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18. How much time was spent discussing labor support?

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<tr>
<th>Time</th>
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<td>16-30 minutes</td>
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19. How much time was spent discussing communication skills between you and your labor partner?

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<th>Time</th>
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<tr>
<td>16-30 minutes</td>
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20. How much time was spent discussing communication skills between you and your medical staff?

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<th>Time</th>
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<tbody>
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<td>16-30 minutes</td>
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21. How much time was spent discussing problems that could occur during labor and delivery?

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<th>Time</th>
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22. How much time was spent discussing medication?

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<th>Time</th>
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23. How much time was spent discussing side effects of medication?

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<th>Time</th>
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<td>16-30 minutes</td>
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24. How much time was spent discussing medical procedures/intervention (i.e., induction, episiotomy, forceps, vacuum, etc.)?

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<thead>
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<th>Time</th>
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25. How much time was spent discussing birth plans?

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<th>Time</th>
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</table>
26. How much time was spent discussing Cesarean section?

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<th></th>
<th>0 minutes</th>
<th>1-15 minutes</th>
<th>16-30 minutes</th>
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27. How much time was spent discussing other topics? (please list)

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<th></th>
<th>0 minutes</th>
<th>1-15 minutes</th>
<th>16-30 minutes</th>
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28. How much time was spent practicing other techniques? (please list)

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<th>0 minutes</th>
<th>1-15 minutes</th>
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## Meditation Log

<table>
<thead>
<tr>
<th>Day of Week</th>
<th>Exercise</th>
<th>Number of times practiced</th>
<th>Duration of time for each practice</th>
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Stress-Management Practice Assessment Form

1) Did you practice any of the stress-management skills since your session?
   Yes  No
   a. If no, please stop.
   b. If yes, please continue with the next question.

2) Which stress-management skills did you practice?
   a. Belly/diaphragmatic breathing
   b. Holding the breath
   c. Rhythmic breathing
   d. Counting breaths
   e. Rebreathing
   f. Relaxation

3) On average, how often did you practice each of the following techniques?
   a. Belly/diaphragmatic breathing
      | i. 1-2 times/week | ii. 3-4 times/week |
      | iii. 5-6 times/week | iv. Daily |
   b. Holding the breath
      | i. 1-2 times/week | ii. 3-4 times/week |
      | iii. 5-6 times/week | iv. Daily |
   c. Rhythmic breathing
      | i. 1-2 times/week | ii. 3-4 times/week |
      | iii. 5-6 times/week | iv. Daily |
   d. Counting breaths
      | i. 1-2 times/week | ii. 3-4 times/week |
      | iii. 5-6 times/week | iv. Daily |
   e. Rebreathing
      | i. 1-2 times/week | ii. 3-4 times/week |
      | iii. 5-6 times/week | iv. Daily |
   f. Relaxation
      | i. 1-2 times/week | ii. 3-4 times/week |
      | iii. 5-6 times/week | iv. Daily |
4) On average, how long during each sitting did you practice the following techniques?

a. Belly/diaphragmatic breathing

| i. 0-15 minutes | ii. 16-30 minutes |
| iii. 31-45 minutes | iv. Over 45 minutes |

b. Holding the breath

| i. 0-15 minutes | ii. 16-30 minutes |
| iii. 31-45 minutes | iv. Over 45 minutes |

c. Rhythmic breathing

| i. 0-15 minutes | ii. 16-30 minutes |
| iii. 31-45 minutes | iv. Over 45 minutes |

d. Counting breaths

| i. 0-15 minutes | ii. 16-30 minutes |
| iii. 31-45 minutes | iv. Over 45 minutes |

e. Rebreathing

| i. 0-15 minutes | ii. 16-30 minutes |
| iii. 31-45 minutes | iv. Over 45 minutes |

f. Relaxation

| i. 0-15 minutes | ii. 16-30 minutes |
| iii. 31-45 minutes | iv. Over 45 minutes |
Post-program Mindfulness Practice Assessment Form

1) Did you practice mindfulness since your last session?  Yes  No
   a. If no, please stop.
   b. If yes, please continue with the next question.

2) Which mindfulness techniques did you practice?
   a. Sitting with the breath  Yes  No
   b. Sitting with sound  Yes  No
   c. Sitting with thoughts/feelings  Yes  No
   d. Walking meditation  Yes  No
   e. Fully body scan  Yes  No

3) On average, how often did you practice each of the following techniques?
   a. Sitting with the breath
      i. 1-2 times/week
      ii. 3-4 times/week
      iii. 5-6 times/week
      iv. Daily
   
   b. Sitting with sound
      i. 1-2 times/week
      ii. 3-4 times/week
      iii. 5-6 times/week
      iv. Daily
   
   c. Sitting with thoughts/feelings
      i. 1-2 times/week
      ii. 3-4 times/week
      iii. 5-6 times/week
      iv. Daily
   
   d. Walking meditation
      i. 1-2 times/week
      ii. 3-4 times/week
      iii. 5-6 times/week
      iv. Daily
   
   e. Full body scan
      i. 1-2 times/week
      ii. 3-4 times/week
      iii. 5-6 times/week
      iv. Daily

4) On average, how long during each sitting did you practice the following techniques?
   a. Sitting with the breath
      i. 0-15 minutes
      ii. 16-30 minutes
      iii. 31-45 minutes
      iv. Over 45 minutes
b. Sitting with sound

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<th>i. 0-15 minutes</th>
<th>ii. 16-30 minutes</th>
<th>iii. 31-45 minutes</th>
<th>iv. Over 45 minutes</th>
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</table>

c. Sitting with thoughts/feelings

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<th>i. 0-15 minutes</th>
<th>ii. 16-30 minutes</th>
<th>iii. 31-45 minutes</th>
<th>iv. Over 45 minutes</th>
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</table>

d. Walking meditation

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<tr>
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<th>i. 0-15 minutes</th>
<th>ii. 16-30 minutes</th>
<th>iii. 31-45 minutes</th>
<th>iv. Over 45 minutes</th>
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</table>

e. Full body scan

<table>
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<tr>
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<th>i. 0-15 minutes</th>
<th>ii. 16-30 minutes</th>
<th>iii. 31-45 minutes</th>
<th>iv. Over 45 minutes</th>
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5) Did you use the guided tape to help you practice?  Yes  No

a. If no, please stop.

b. If yes, on average, how often did you use this tape?

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<th>i. 1-2 weeks</th>
<th>ii. 3-4 weeks</th>
<th>iii. 5-6 weeks</th>
<th>iv. More than 6 weeks</th>
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</table>
Labor and Delivery Assessment Form

1) Type of delivery, and if a cesarean section, the reasons for this.

   a. If you had a cesarean section, did you have an epidural or spinal?  Yes  No

2) Induction of labor?  Yes  No  If yes, how?

3) Augmentation of labor?  Yes  No  If yes, how?

4) Medications received during labor:

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<thead>
<tr>
<th>Medications</th>
<th>Time administered/Phase/stage of labor</th>
<th>Dosage</th>
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5) Did you have an epidural?  Yes  No

6) Were any of the following medical interventions used?

   a. Electronic fetal monitoring?  Yes  No
   b. Ultrasound?  Yes  No
   c. Forceps?  Yes  No
   d. Vacuum extraction?  Yes  No
   e. Episiotomy?  Yes  No
   f. Other:  ___________________________  Yes  No
7) Length of labor and delivery (in minutes):


8) Baby’s Apgar score: Time 1: ___________ Time 2: ___________

9) Baby’s birth weight: ___________
Post-program Evaluation Form
Version A

Please circle your answer.

1. How sensible was the rationale for the mindfulness techniques?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

2. How effective was the instructor in communicating and teaching you the techniques?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

3. How motivated did the instructor appear?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

4. How helpful would more contact with the instructor have been?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

5. How much effort did you put into learning these techniques?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

6. How compliant were you in completing the homework assignments?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

7. How well do you feel you mastered the techniques that you were taught?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

8. How effective were the techniques you have learned?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

9. To what extent do you specifically and intentionally plan to continue to use these techniques?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

10. To what extent do you think the techniques have become "second nature" to you; that is, they are learned enough such that you don’t have to specifically and intentionally use them, it just kind of happens?
    1  2  3  4  5
    Not at all  Somewhat  Moderately  Very  Extremely
Post-program Evaluation Form
Version B

Please circle your answer.

1. How sensible was the rationale for the stress management techniques?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

2. How effective was the instructor in communicating and teaching you the techniques?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

3. How motivated did the instructor appear?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

4. How helpful would more contact with the instructor have been?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

5. How much effort did you put into learning these techniques?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

6. How well do you feel you have mastered the techniques that you were taught?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely

7. To what extent do you specifically and intentionally plan to continue to use these techniques?
   1  2  3  4  5
   Not at all  Somewhat  Moderately  Very  Extremely
Appendix I

Outline of Sessions
Outline of One-Session Stress-Management Program


One-Session Stress-Management Program
Session

- Introductions
- Overview of session and what to expect
- Explanation of the study and answer questions
- Obtain informed consent
- Participant completes
  - Meditation Practices Assessment form
  - Demographic form
  - Childbirth Preparation Class Assessment form
  - W-DEQ version A
  - STAI
  - KIMS
- Assign participant to one of the two programs/conditions
- Provide an overview of this session and what to expect
- Anxiety
  - Psychoeducation of anxiety
  - Explanation about biological, cognitive, and behavioral components
  - Benefits of anxiety
  - Consequences of high levels of anxiety
  - Factors that can influence the experience of anxiety
  - Discussion to clarify any misconceptions or questions
- Breathing
  - Psychoeducation of breathing
  - Relationship between breathing and anxiety
  - Hyperventilation
  - Techniques to control/prevent hyperventilation
    - Introduce and practice diaphragmatic breathing
    - Introduce and practice holding the breath
    - Introduce and practice rhythmic breathing
    - Introduce and practice counting breaths
    - Introduce and practice rebreathing
    - Discussion and clarification of issues will be woven into both the didactic and experiential activities
• Relaxation
  o Psychoeducation of relaxation
  o Why relaxation may be beneficial
  o Variations of relaxation training (i.e. differences in the number of muscle groups involved, release-only relaxation, cue-controlled relaxation)
  o Practice progressive muscle relaxation
• Brief discussion on how to incorporate these activities into childbirth
• Inform participant about the importance of practice for learning these skills
• Participant completes the KIMS and post-program evaluation form version B
• Provide participant with two business cards with student investigator’s telephone number
• Ask participant to contact the researcher following childbirth while still in the hospital
  o Explain why
• Remind participant that she will be mailed withdrawal from study form one week prior to estimated due date
  o Instruct her to return form in envelope provided only if she wishes to discontinue participation in the study
• Remind participant that if the withdrawal from study form is not received one week following her estimated due date and the participant has not contacted the researcher, the researcher will attempt to contact her
  o Explain why
• End session by thanking participant for her time and wishing her well with childbirth.
Outline of Four-Session Mindfulness Program

Mindfulness in Childbirth Preparation
(Taken and modified from Kabat-Zinn, 1990)

Four-Session Mindfulness Program
Session 1
- Introductions
- Overview of session and what to expect
- Explanation of the study and answer questions
- Obtain informed consent
- Participant completes
  - Meditation Practices Assessment form
  - Demographic form
  - Childbirth Preparation Class Assessment form
  - W-DEQ version A
  - STAI
  - KIMS
- Overview of what we'll do today
- Introduction to mindfulness
  - What it is and what it is not
  - How to achieve mindfulness
  - Brief review of related research
  - Seven attitudinal factors
- Explain mindfulness of breathing
- Mindfulness of breathing activity (3 minutes)
  - Explain why belly breathing
  - Discuss experiences of this activity
- Why is mindfulness of breathing important?
- How to practice mindfulness of breathing
  - Formal practice
  - Informal practice
- Explain body scan
- Practice brief body scan
  - Discuss experiences of this activity
- Discussion of homework/practice in between sessions
  - Relation between practice and performance
  - Sitting with the breath
    - Practice 10 minutes daily for first 3 days
    - Practice 15-20 minutes daily for subsequent days
    - Choose time of day and setting
- Record duration and frequency
- When mind wanders from breathing, bring it back
  - Informally practice mindfulness of breathing
    - Feel your belly rise and fall several times
    - Become aware of thoughts and feelings at this moment; observe without judging
    - Become aware of any changes in the way you're seeing things or feeling about yourself
  - Informally practice mindfulness in daily life
    - Either do so with daily activities and mindfully observe what you are doing, thinking, and feeling OR pick one activity and mindfully observe
    - Record activities practiced using mindfulness
  - Practice body scan daily
    - Choose time of day and setting
    - Record frequency and duration
  - Introduce participants to meditation log and describe how to use it
  - Provide participants with guided tape
    - Instructed to use the tape for at least the first week
    - May choose to use the tape to help in meditation exercises thereafter
- End with mindfulness activity
  - Sitting with breath

Session 2
- Begin with mindfulness activity
  - Sitting with breath
- Overview of session today
- Review homework and discussion of questions or concerns
- How to incorporate mindfulness into childbirth
  - Responding rather than reacting
  - Thoughts and feelings during childbirth
  - Body sensations during childbirth
  - Unexpected issues that may arise
  - Practice improves the skill
  - Practice across a variety of experiences for generalization
- Explain sitting with sound
- Practice sitting with sound
  - Discuss experiences of this activity
- Practice full body scan
  - Discuss experiences of this activity
- Discussion of homework/practice in between sessions
  - Practice sitting with sound
• 10 minutes daily for first 3 days
• 15-20 minutes every other day for subsequent days
• Choose time of day and setting
• Record frequency and duration
  o Informally practice mindfulness of breathing
  o Informally practice mindfulness in daily life
    ▪ Record activities practiced using mindfulness
  o Practice body scan daily
    ▪ Choose time of day and setting
    ▪ Record frequency and duration
  o Remind participants to use meditation log
  o Remind participants to teach their birthing coach these mindfulness skills
• End with mindfulness activity
  o Sitting with sound

Session 3
• Begin with explanation of incorporating distraction techniques throughout this session
• Open with mindfulness activity
  o Sitting with sound (use guided meditation tape with random bells)
• Overview of session today
• Review homework and discuss questions or concerns
• Explain sitting with thoughts and feelings
• Practice sitting with thoughts and feelings
  o Discuss experiences of this activity
• Practice full body scan
  o Incorporate distraction by random sounds and random touches to participant’s arm, shoulders, or calf, along with moving participant’s arm or leg
  o Discuss experiences of this activity
• Discussion of homework/practice in between sessions
  o Practice sitting with thoughts and feelings
    ▪ 5-10 minutes daily for first 3 days
    ▪ 10-20 minutes daily for subsequent days
    ▪ Choose time of day and setting
    ▪ Record frequency and duration
  o Informally practice awareness of one unpleasant and one pleasant event daily
  o Informally practice mindfulness of breathing
  o Informally practice mindfulness in daily life
  o Practice body scan daily
    ▪ Choose time of day and setting
    ▪ Record frequency and duration
  o Remind participants to use mediation log
• Remind participants to practice mindfulness with distractions, including significant other/birthing partner touching them and moving their arm or leg, practicing with background noise, etc.

• End with mindfulness activity
  o Sitting with thoughts and feelings

Session 4
• Begin with mindfulness activity
  o Sitting with thoughts and feelings (add in physical and auditory distractions)

• Overview of session today
• Review homework and discussion of questions or concerns
• Explain walking meditation
• Practice walking meditation
  o Discuss experiences of this activity
• Discussion of creating your own meditation program
  o Sitting meditations, body scan, walking meditation, formal and informal practice
  o Practicing with physical and auditory distractions
  o Practice 45 minutes daily
  o Encourage participants to practice daily until at least childbirth
  o Remind participants why practice is important

• Participants complete KIMS and post-program evaluation form version A
• Provide participant with two business cards with student investigator’s or RA’s telephone number
• Ask participant to contact the researcher following childbirth while still in the hospital
  o Explain why
• Remind participant that she will be mailed withdrawal from study form one week prior to estimated due date
  o Instruct her to return form in envelope provided only if she wishes to discontinue participation in the study
• Remind participant that if the withdrawal from study form is not received one week following her estimated due date and the participant has not contacted the researcher, the researcher will attempt to contact her
  o Explain why

• End with mindfulness activity of participants’ choice
• Thank participant for her time and wish her well with childbirth
Appendix J

Referral List
REFERRAL LIST

Places with specific grief-related services

Bronson Healthcare Group
- Bereavement (individual services and support groups)
- SIDS

341-8484

Borgess Visiting Nurses

343-1396

Places that can provide a range of mental health services

Outpatient Services:

WMU Psychology Clinic* ......................................... 387-8302
WMU Counseling Center* ........................................ 387-1850
Gryphon HELPLINE (24-hour service)* (381-HELP) ....... 381-4357
Gryphon Place* .......................................................... 381-1510
Delano Clinic ............................................................. 226-5600
Child & Family Psychological Services ....................... 372-4140
Family & Children Services ....................................... 344-0202
Pine Rest Christian Mental Health Services ................. 343-6700

Disability Information and Referrals:
Disability Resources Center of Kalamazoo .................. 345-1516

Specific Websites:
National Down Syndrome Society ......................... www.ndss.org
National Association for Down Syndrome ............... www.nads.org
United Cerebral Palsy ............................................... www.ucp.org

Continuing Education
Borgess Class and Event Schedule ......................... 226-8135
Bronson Class Information .................................... 341-7654
www.bronsonhealth.com/calendar

*Services may be at a reduced cost or no cost for students.
** This is a sample of potential referrals/resources that may be offered to the participant.
All referrals/resources offered will be tailored to each participant’s specific needs.
Appendix K

Withdrawal From Study Form and Letter Sent With the Form
Withdrawal From the Study Form

This document states that I, (______________________________participant) withdraw my consent to participate in the study entitled, “Mindfulness in childbirth: An investigation of the effects of mindfulness training on maternal satisfaction with childbirth and obstetric outcomes.” By signing this form, I am withdrawing myself as a participant in this study.

Participant Signature ___________________________ Date ____________

Witness Signature ___________________________ Date ____________
Dear (Insert participant’s name),

This is a follow-up letter to your participation in my dissertation project entitled, “Mindfulness in Childbirth: An investigation of the Effects of Mindfulness Training on Maternal Satisfaction with Childbirth and Obstetric Outcomes.” You were told that you would be sent a withdrawal from the study form one week prior to your estimated due date, and I have included that form with this letter. This form is to provide you with an opportunity to discontinue participation in this study if you choose to do so. If, after childbirth, you decide that you do not wish to continue with this study, then please sign and return this withdrawal from the study form in the envelope provided. However, if you are still interested in participating in this study following childbirth, please discard this form. You were also instructed to contact the researcher while in the hospital so that you might have an opportunity to share your childbirth story with your program trainer and to gather postpartum assessment measures. If, after childbirth, you are still interested in participating with this study, please contact the researcher at (INSERT PHONE NUMBER). I have also included two additional business cards with this contact number if you have misplaced the cards given to you at the end of your last session.

Remember, only sign and return the withdrawal from the study form if you wish to discontinue participation in this study. Otherwise, you may discard this form. If you have any questions or concerns, please don’t hesitate to contact me at (269) 387-4485 or through e-mail at b2bratto@wmich.edu. Thank you for your time participating in this study.

Sincerely,

Brenda Bratton, M.A.
Doctoral Student
WMU Dept. of Psychology
Appendix L

Letter Sent With Postpartum Assessment Measures
Dear (Insert participant’s name),

This is a follow-up letter to your participation in my dissertation project entitled, “Mindfulness in Childbirth: An investigation of the Effects of Mindfulness Training on Maternal Satisfaction with Childbirth and Obstetric Outcomes.” I hope that your childbirth experience was a positive one. If you have not given birth yet, I wish you well for a memorable experience.

The intent of this letter is to remind you of the instructions given to you verbally at our last session. You were asked to contact the researcher postpartum while still in the hospital. The purpose for this was to provide you with an opportunity to share your birthing story along with an opportunity to gather postpartum assessment measures. If you have not had an opportunity yet to share your birthing story with me, I’d be delighted to hear about your childbirth process. You may contact me at (INSERT PHONE NUMBER) if you wish. I have also included the postpartum assessment measures as were discussed during our initial session. I have included the following measures: Wijma Delivery Experience Questionnaire version B, the State-Trait Anxiety Inventory, the Kentucky Inventory of Mindfulness Skills, the Maternal Satisfaction Questionnaire, the Labor and Delivery Assessment form, and (the Post-program Mindfulness Practice Assessment form or Stress-Management Practice Assessment form). Additionally, if you had not taken your childbirth preparation class by our initial session, then I have also included a form to gather information about this class. If you notice that you are missing any of these forms, please contact me, and I will mail you the needed form(s). Please follow the directions on each assessment measure and complete them as directed. When you have completed these measures, please return them in the self-addressed postage paid envelope that has been provided for you.

If you have any questions or concerns, please don’t hesitate to contact me at (269) 387-4485 or through e-mail at b2bratto@wmich.edu. Thank you very much for your time participating in this study. I wish you and your family the best!

Sincerely,

Brenda Bratton, M.A.
Doctoral Student
WMU Dept. of Psychology
Appendix M

Therapist Adherence Form
### Therapist Adherence Form

**Didactics**

1. Did the researcher explain the topic of mindfulness?  
   - YES  
   - NO
2. Did the researcher review research on mindfulness?  
   - YES  
   - NO
3. Did the researcher explain the seven attitudinal factors of mindfulness?  
   - YES  
   - NO
4. Did the researcher explain mindfulness of breathing?  
   - YES  
   - NO
5. Did the researcher explain how to incorporate these activities into childbirth?  
   - YES  
   - NO
6. Did the researcher explain why mindfulness of breathing is important?  
   - YES  
   - NO
7. Did the researcher explain how to practice mindfulness of breathing?  
   - YES  
   - NO
8. Did the researcher explain sitting with sound?  
   - YES  
   - NO
9. Did the researcher explain incorporating distraction techniques into this session?  
   - YES  
   - NO
10. Did the researcher explain sitting with thoughts and feelings?  
    - YES  
    - NO
11. Did the researcher explain walking meditation?  
    - YES  
    - NO
12. Did the researcher explain the body scan technique?  
    - YES  
    - NO
13. Did the researcher review the topic of stress and its relation to anxiety?  
    - YES  
    - NO
14. Did the researcher explain the biological component of anxiety?  
    - YES  
    - NO
15. Did the researcher explain the cognitive component of anxiety?  
    - YES  
    - NO
16. Did the researcher explain the behavioral component of anxiety?  
    - YES  
    - NO
17. Did the researcher describe the benefits of anxiety?  
    - YES  
    - NO
18. Did the researcher describe the consequences of anxiety?  
    - YES  
    - NO
19. Did the researcher explain factors that may influence anxiety?  
    - YES  
    - NO
20. Did the researcher explain the relationship between breathing and anxiety?  
    - YES  
    - NO
21. Did the researcher explain hyperventilation?  
    - YES  
    - NO
22. Did the researcher describe the following techniques?
   Diaphragmatic breathing? YES   NO
   Rebreathing? YES   NO
   Holding the breath? YES   NO
   Rhythmic breathing? YES   NO
   Counting breaths? YES   NO

23. Did the researcher describe relaxation?
   YES   NO

24. Did the researcher describe why relaxation may be beneficial?
   YES   NO

Experiential

1. Did the researcher open the session with a mindfulness activity?
   YES   NO

2. Did the researcher and participant engage in a mindfulness of breathing exercise?
   YES   NO

3. Did the researcher and participant engage in a brief body scan?
   YES   NO

4. Did the researcher and participant practice sitting with sound?
   YES   NO

5. Were distraction techniques used during the opening mindfulness activity?
   YES   NO

6. Did the researcher and participant practice sitting with thoughts and feelings?
   YES   NO

7. Did the researcher and participant practice walking meditation?
   YES   NO

8. Did the researcher and participant practice a full body scan?
   YES   NO

9. Were distraction techniques used during the full body scan?
   YES   NO

10. Did the session end with a mindfulness activity?
    YES   NO

11. Did the researcher demonstrate the following techniques?
    Diaphragmatic breathing? YES   NO
        Rebreathing? YES   NO
        Holding the breath? YES   NO
        Rhythmic breathing? YES   NO
        Counting breaths? YES   NO

12. Did the researcher and participant practice progressive muscle relaxation?
    YES   NO
Homework

1. Did the researcher and participant review homework and discuss questions/concerns of it?  
   YES NO

2. Did the researcher describe the importance of homework and the relation between practice and performance?  
   YES NO

3. Did the researcher assign the following for homework for the next week?  
   - Sitting with the breath? YES NO  
   - Informal practice of mindfulness of breathing? YES NO  
   - Informal practice of mindfulness in daily life? YES NO  
   - Body scan? YES NO  
   - Sitting with sounds? YES NO  
   - Teach birthing coach the mindfulness skills? YES NO  
   - Sitting with thoughts and feelings? YES NO  
   - Informal practice of awareness of one unpleasant and one pleasant event daily? YES NO

4. Did the researcher help the participant create her own meditation program?  
   YES NO

5. Was the participant instructed to practice her own meditation program daily for at least 45 minutes until at least childbirth AND to practice with distractions?  
   YES NO

6. Did the researcher introduce the meditation log to the participant and describe how to use it?  
   YES NO

7. Did the researcher remind the participant to use the meditation log?  
   YES NO

8. Did the researcher remind participants to practice mindfulness with distractions?  
   YES NO

9. Did the researcher provide the participant with a guided meditation tape/CD?  
   YES NO
Appendix N

Human Subjects Institutional Review Board
Letter of Approval
Date: January 20, 2006

To: Amy Naugle, Principal Investigator
Mary Ann Stark, Co-Principal Investigator
Brenda Bratton, Student Investigator for dissertation

From: Mary Lagerwcy, Ph.D., Chair

Re: HSIRB Project Number: 05-12-02

This letter will serve as confirmation that your research project entitled “Mindfulness in Childbirth: An Investigation of the Effects of Mindfulness Training on Maternal Satisfaction with Childbirth and Obstetric Outcomes” has been approved under the full category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may only conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: December 14, 2006