

**MINDFULNESS-BASED INTERVENTIONS FOR ANTENATAL DEPRESSION OR
ANXIETY: PERSPECTIVES OF MIDWIVES**

by

Karen Lynn Celedonia

BA, St. Mary's College of Maryland, 2005

Submitted to the Graduate Faculty of
Graduate School of Public Health in partial fulfillment
of the requirements for the degree of
Master of Public Health

University of Pittsburgh

2009

UNIVERSITY OF PITTSBURGH
GRADUATE SCHOOL OF PUBLIC HEALTH

This thesis was presented

by

Karen Lynn Celedonia

It was defended on

November, 30 2009

and approved by

Thesis Advisor:

Steven M. Albert, PhD, MSPH, MA
Associate Chair of Research and Science
Behavioral and Community Health Sciences
Graduate School of Public Health
University of Pittsburgh

Committee Member:

Christopher R. Keane, ScD, MPH
Assistant Professor
Behavioral and Community Health Sciences
Graduate School of Public Health
University of Pittsburgh

Committee Member:

Janet M. Catov, PhD
Assistant Professor
Epidemiology, Ob-Gyn and Reproductive Science
Graduate School of Public Health, School of Medicine
University of Pittsburgh

Copyright © by Karen Lynn Celedonia

2009

**MINDFULNESS-BASED INTERVENTIONS FOR ANTENATAL DEPRESSION OR
ANXIETY: PERSPECTIVES OF MIDWIVES**

Karen Lynn Celedonia, MPH
University of Pittsburgh, 2009

Antenatal depression and anxiety are significant public health problems. Birth and neonatal outcomes suffer as a result of maternal depression and anxiety during pregnancy. As such, effectively treating depression and anxiety in the expectant mother is imperative to the overall health of mother and child. Psychopharmaceuticals are effective in alleviating depressed and anxious symptoms, but the evidence of the safety of their use during pregnancy is inconclusive. Furthermore, pregnant women themselves express the desire for non-psychopharmaceutical options when deciding how to manage their depression or anxiety. Mindfulness-based interventions show promise as a non-invasive, non-pharmaceutical option for managing negative affective states. To help predict the likelihood of a successful adoption of mindfulness-based interventions, midwives' perspectives on using mindfulness in clinical settings with their depressed or anxious patients were investigated. Results indicated favorable attitudes towards using mindfulness, along with various barriers that may prevent the adoption of mindfulness in clinical settings.

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
1.1	ANTENATAL DEPRESSION AND ANXIETY: PREVALENCE AND OUTCOMES.....	1
1.2	TREATMENT OF DEPRESSION AND ANXIETY DURING PREGNANCY.....	7
1.3	NON-PHARMACOLOGICAL TREATMENTS FOR ANTENATAL DEPRESSION AND ANXIETY	12
1.4	MINDFULNESS: AN OVERVIEW	13
1.5	MINDFULNESS APPLIED TO CLINICAL SETTINGS.....	14
1.6	MINDFULNESS APPLIED TO DEPRESSED OR ANXIOUS PREGNANT WOMEN	18
1.7	PROVIDER ADOPTION OF MINDFULNESS TO TREAT DEPRESSION AND ANXIETY	21
1.8	THEORETICAL FRAMEWORK.....	23
2.0	METHOD	26
3.0	RESULTS	29
3.1	MINDFULNESS’S FIT WITH GENERAL CLINICAL PRACTICE.....	29
3.2	MINDFULNESS’S FIT WITH MIDWIFERY	30

3.3	MINDFULNESS AND MIDWIVES' PERSONAL PRACTICE	31
3.4	MINDFULNESS'S EFFECTIVENESS WITH DEPRESSED OR ANXIOUS PREGNANT WOMEN	32
3.5	BARRIERS TO USING MINDFULNESS IN CLINICAL SETTINGS.....	33
4.0	DISCUSSION	35
4.1	LIMITATIONS.....	41
4.2	CONCLUSION	41
	BIBLIOGRAPHY.....	43

1.0 INTRODUCTION

1.1 ANTENATAL DEPRESSION AND ANXIETY: PREVALENCE AND OUTCOMES

Reported prevalence rates of antenatal depression and anxiety vary. As low as nine percent and as high as 25 percent of all pregnant women are diagnosed with depression at some point during their pregnancy. One study reported antenatal depression at an elevated prevalence rate of 37.1 percent (Lee et al., 2007). Risk rates for antenatal depression reflect a similar range, with women of child-bearing age having as low as a 10 percent risk and as high as a 25 percent risk for developing a depressive disorder during pregnancy (Wisner et al., 1999). Prevalence research on antenatal anxiety is sparse, but evidence also suggests a wide range of prevalence rates, with as low as 6.6 percent (Andersson et al., 2003) of all pregnant women suffering from anxiety during pregnancy and as high as 54 percent meeting the clinical criteria for anxiety (Lee et al., 2007). It should be noted that less epidemiological research has been done on antenatal anxiety than on antenatal depression.

A host of negative birth outcomes are associated with antenatal depression and anxiety. Infants born from mothers with depression or anxiety are at increased risk for being born low birth weight; infants weighing less than 2,500 grams (or 5 lbs., 8 oz.) are classified as low birth weight (Hamilton et al., 2009). Low birth weight is a very serious adverse birth outcome that can

lead to neonatal complications, developmental delays, and infant mortality (Goldenberg & Culhane, 2007). In a study of chronic prenatal depression and neonatal outcomes, infants whose mothers were chronically depressed during pregnancy were of lower gestational age and lower birth weight than infants born to non-depressed mothers (Field et al. 2008). Similarly, a study that examined the association between psychological stress or distress and low birth weight found a significant association between maternal psychological distress in the second and third trimesters of pregnancy and low birth weight infants (Rondo et al., 2003).

Another undesirable birth outcome associated with antenatal maternal depression and anxiety is preterm birth; preterm birth is any birth that occurs at less than 37 weeks of gestational age (Goldenberg et al., 2008). A large percentage (75%) of perinatal mortalities is attributed to preterm birth, and greater than 50 percent of long-term infant morbidity results from preterm birth (McCormick, 1985). Preterm birth is also associated with low birth weight, which as previously mentioned, is a birth outcome that can have dire consequences for the newborn. Li et al. (2009) conducted a prospective cohort study to determine the impact of antenatal depression on the risk of preterm delivery. Women experiencing depression during pregnancy were twice as likely to deliver preterm. A dose-response relationship between levels of depression and risk for preterm delivery was also reported: the risk for preterm delivery increased with higher levels of depression. Mancuso et al. (2004) found that women with higher levels of anxiety during pregnancy and higher levels of stress hormones delivered earlier than pregnant women with low levels of anxiety and stress hormones.

One proposed causal pathway for these negative birth outcomes is the effect stress, anxiety, and depression have on the maternal immune response. Cytokines—such as Interleukin 6—are found to be at elevated levels in the serum of pregnant women experiencing negative

psychosocial states (Coussons-Read et al., 2005; Coussons-Read et al., 2007). Subsequent adverse birth outcomes similar to those reported in the literature on outcomes associated with antenatal depression and anxiety have been observed in women with elevated IL-6; these outcomes include preterm birth, miscarriage, and preeclampsia (Cobo et al., 2009; Hattori et al., 2007; Jonsson et al., 2007). There is also evidence that antenatal elevated levels of IL-6 are associated with the development of autism and schizophrenia in offspring in animal studies (Smith et al., 2007).

Maternal mood can also negatively impact obstetric outcomes. Women with depressive symptoms during pregnancy are more likely to receive epidural analgesia, and operative deliveries—caesareans or instrumental vaginal deliveries—are more likely to occur among depressed women as well (Chung et al., 2001). Saunders et al. (2006) found similar obstetric events associated with maternal stress and a possible relationship between analgesia receipt and unplanned cesarean, suggesting that analgesia administration may increase the need for an unplanned cesarean. Resorting to unplanned cesareans is not an ideal obstetric intervention: failed progression of labor that results in unplanned cesareans increases the risk of maternal and fetal morbidity (Murphy et al., 2001).

Neonatal outcomes suffer from the presence of maternal depression and/or anxiety during pregnancy. Chung et al., (2001) found that infants born to mothers who presented with depressive symptoms during their pregnancy were at increased risk of being admitted to the neonatal intensive care unit. Furthermore, infants of antenatally depressed mothers have been shown to present with inferior performance on standardized neurobehavioral assessments (Lundy et al., 1999; Field et al., 2004). One explanation for the infants' sub par performance—especially behaviors associated with depression—is the apparent biochemical mimicry that occurs between

the mother and infant. The biochemical composition of infants of depressed women mirrors that of the mother: infants present with higher cortisol levels and lower dopamine and serotonin chemicals, much like their mothers (Field et al., 2004).

Depressive and anxious/stressed symptoms during pregnancy are also associated with excessive crying in infants born to depressed or anxious women (van der Wal et al., 2007). Respiratory distress in infants of depressed or anxious mothers may be another complication associated with negative maternal affective states, but the study that found this complication did not use a control group of pregnant women free from depression or anxiety to compare to the pregnant women with depression or anxiety (Mirsi et al., 2004). Untreated antenatal depression may also disrupt the fetus's heart rate. Allister et al. (2001) found elevated heart rate levels in fetuses of depressed women. Thus, the potential adverse neonatal outcomes associated with depression or anxiety during pregnancy are numerous and varied, ranging from physical problems to alteration in the infants physiological make-up.

In addition to adverse birth, obstetric, and neonatal outcomes, antenatal maternal depression and anxiety puts women at a greater risk for developing post-partum depression (Milgrom et al., 2008). Post-partum depression has been reported to have an array of negative consequences on the mother-infant dyad. When interacting with their infants, depressed mothers exhibit behaviors that cumulatively result in decreased face-to-face mother-infant interaction. Less positive affect, less activity, less responsiveness, more discontented facial expressions, and engaging in less game-playing have all been observed in depressed mothers' interaction with their infants (Field, 1985). This in turn affects the infant's interaction with the mother, disrupting the bonding that normally occurs between the mother-infant dyad.

Post-partum depression can also have numerous deleterious effects on parenting, increasing the risk of child maltreatment. Mothers with post-partum depression are at a greater risk for neglecting their infants. Mothers with post-partum depression are less likely to engage in behaviors important to the health and development of the infant, such as continued breastfeeding, establishing routines, reading or talking to the infant, and playing with the infant (McLearn et al., 2006; Lieferman et al., 2005). Depressed mothers also assume a more authoritarian parenting style, as evidenced by their more controlling and punitive outlook towards childrearing (Field et al., 1985). An infant's safety can even be jeopardized if a mother is clinically depressed: depressed mothers show a decrease in child safety behaviors, such as using car seats and seatbelts, keeping poisons and firearms out of reach, and using electrical covers and safety latches (McLearn et al., 2006; Rhodes et al., 2007).

Effects beyond the neonatal and post-partum stages on the offspring of a depressed or anxious mother have also been reported in the literature. Deave et al. (2008) studied the impact of maternal depressive symptoms on child development at 18 months, finding that maternal depressive symptoms during pregnancy were related to developmental delays in children 18 months of age. A longitudinal study revealed that adolescents antenatally exposed to depression are 4.5 times more likely to experience depressive symptoms than adolescents who were not exposed to depression in-utero (Pawlby et al., 2009). Children of antenatally anxious mothers are more likely to present with behavioral/emotional problems at 4 years of age (O'Connor et al., 2002). Adolescents whose mothers experienced anxiety during pregnancy perform significantly lower on cognitive tasks than adolescents of mothers who were not anxious during pregnancy (Mennes et al., 2006).

The health status and health behaviors of women suffering from depressed or anxious states during pregnancy may also be compromised. Self-reported measures of health and functional status for depressed pregnant women are lower than the reported scores of non-depressed pregnant women (Orr et al., 2007), and women with high levels of depression are at twice the risk of experiencing impaired health and functional status. Behaviorally, substance misuse and dependency is of particular concern for depressed or anxious pregnant women. Substance abusing pregnant women are more likely to be depressed or anxious (Haller et al., 1993), and substance dependency is independently associated with maternal depression (Pajulo et al., 2001). Depressed, pregnant women are also less likely to engage in important prenatal health behaviors, such as exercising, getting adequate sleep, and regularly taking prenatal vitamins (Lindgren, 2001; Allister et al., 2001). The weak maternal-fetal bond that develops between depressed mother and fetus (Lindgren, 2001) may contribute to the depressed mother's tendency to engage in negligent or irresponsible health behaviors, such as not learning about pregnancy and smoking during pregnancy.

Considering the numerous potential ways in which antenatal depression and anxiety can have negative effects on the mother and her child at various stages of growth and development, effectively treating a pregnant woman's depression or anxiety is crucial to the health and well-being of her offspring and herself. Letting the depression or anxiety go untreated puts the mother and child at heightened, undue risk of experiencing grave health consequences, a risk that can possibly be avoided by timely, effective treatment. The various treatment modalities for depression and anxiety in pregnant women and the respective effectiveness and safety of each modality will now be discussed in detail.

1.2 TREATMENT OF DEPRESSION AND ANXIETY DURING PREGNANCY

Presently, treating pregnant women suffering from depression and anxiety with psychopharmaceuticals—such as SSRIs, tricyclic antidepressants, and benzodiazepines—is the most common treatment modality (Yonkers et al., 2009). These medications are the same medications used to treat non-pregnant women and men; they are not specifically manufactured for the unique physiology of a pregnant woman or the presence of a fetus. The impact of psychopharmaceuticals on the developing fetus and neonate is not yet definitively known, but evidence is amassing in the literature that suggests antenatal use of psychopharmaceuticals to treat depression and anxiety could potentially have adverse outcomes on the fetus and even the mother.

Most research on antidepressants and birth outcomes has focused on selective-serotonin reuptake inhibitors (SSRIs) because these are the most commonly prescribed antidepressant medications for pregnant women. A higher rate of preterm delivery is the most consistently reported deleterious consequence of antenatal SSRI antidepressants. In a prospective observational study, preterm deliveries among women using SSRIs late in pregnancy exceeded 20 percent, as compared to pregnant women with no SSRI use (Wisner et al., 2009). Previous studies conducted two years prior to Wisner et al. also reported increased risk of preterm delivery among pregnant women exposed to psychopharmaceuticals for treatment of depression and anxiety (Wikner et al., 2007; David et al., 2007). As mentioned previously, preterm delivery can be a very serious birth outcome.

Along with preterm delivery, low birth weight among infants exposed to anti-depressants and anti-anxiety medications has been documented in the literature. In a study that examined birth weight and birth length of SSRI-exposed infants, the birth weight—and birth length and

head circumference—of the SSRI group was below the 10th percentile for age in more SSRI exposed infants than non-SSRI exposed infants (Davidson et al., 2009). Recall that low birth weight infants are at increased risk for mortality, morbidity, and long-term disability, rendering it a serious adverse pregnancy outcome (Goldenberg & Culhane, 2007).

Several studies have also reported the phenomenon of neonatal abstinence syndrome (NAS)—or quite simply, withdrawal—in infants exposed to SSRIs and anti-anxiety medications during pregnancy. While this syndrome is transient in neonates, it is still a congenital condition that requires special attention and monitoring from medical professionals. Gone unnoticed, NAS can further add to the physiological distress the neonate is experiencing as result of exposure to anti-depressant pharmaceuticals. Levinson-Castiel et al. (2006) reported that up to 30 percent of antenatally SSRI-exposed infants presented with symptoms of NAS, which include tremulousness, gastrointestinal and sleep disturbances, hypertonicity, and high-pitched cry. Case reports of withdrawal symptoms in infants antenatally exposed to anti-anxiety medications late in pregnancy also exist in the literature (Rementeria et al., 1977)

One of the most startling discoveries in research related to SSRI exposure and infant outcomes is an apparent association between maternal SSRI-use during pregnancy and increased rates of persistent pulmonary hypertension (PPHN) in exposed infants. PPHN is a serious condition that is associated with increased infant morbidity and mortality (Walsh-Sukys et al., 2000). In a larger-scale repetition of a previous, smaller study on the topic, Chambers et al., (2006) found that there was a statistically significant association between use of SSRIs in late pregnancy and clinical presentation of persistent pulmonary hypertension in the respective infant.

Yet another concerning finding surfacing about antenatal use of anti-depressants is the potential disruptive effect on the infant's cardiac rhythm. There is evidence that SSRI-exposed

infants may be at increased risk for QT interval abnormality; more specifically, SSRI-exposed infants are more likely to have prolonged QT intervals than their non-exposed counterparts. Dubnov-Raz et al. (2008) found that the mean QT interval in SSRI exposed infants was significantly longer than controls, and 10 percent of SSRI exposed infants had pathologically prolonged QT intervals. A prolonged QT interval is a very serious cardiac condition: it puts one at increased risk for sudden death and malignant arrhythmia (Moss et al., 1991).

The neurobehavior of SSRI-exposed infants also seems to be disturbed when compared to non-SSRI-exposed infants (Boucher et al., 2007). SSRI-exposed infants suffer from sleep disorganization, a more active resting state, increased tremulousness and startles, and less autonomic physiological regulation (Zeskind & Stevens, 2004). More research on this topic is necessary to determine the incidence and severity of this side effect of SSRI exposure during pregnancy, and to differentiate it from neonatal abstinence syndrome. Longitudinal studies of SSRI-exposed infants' neurobehavior would be helpful to determine the persistence of the disruptions in neurobehavior, thereby distinguishing it from NAS, which is a transient syndrome.

A slight increased risk of congenital malformations is associated with antenatal use of anti-depressant and anxiety medication. Davis et al. (2007) showed that exposure to tricyclic anti-depressants in early pregnancy resulted in an increased risk for spina bifida and limb abnormalities in offspring. Among benzodiazepine exposed infants, 5.3 percent were identified as having malformations of some kind upon birth (Wikner et al., 2007). The risk of congenital malformations due to antenatal exposure to psychopharmaceuticals is not alarmingly high, but it poses enough risk to the fetus to cause concern.

Research thus far on antenatal use of psychopharmaceuticals has mainly focused on the impact on the fetus and neonate: no attention has been given to the effects on the pregnant

woman herself until very recently. Toh et al. (2009) addressed the gap in the literature on antenatal exposure to psychopharmaceuticals and the impact on the mother in their study on antenatal exposure to SSRIs and risk of gestational hypertension. In SSRI exposed mothers, 19.1 percent presented with gestational hypertension, whereas only nine percent of non-SSRI exposed mothers met clinical requirements for gestational hypertension. Additionally, among SSRI-exposed mothers, 15.2 percent were diagnosed with pre-eclampsia; only 2.4 percent of non-SSRI exposed mothers had pre-eclampsia. Pre-eclampsia is considered a very serious condition during pregnancy.

In light of the emerging literature elucidating possible risks of antenatal use of psychopharmaceuticals, professionals in the women's health and mental health fields decided to conduct a collaborative investigation to examine the issue further. A joint report issued by the American Psychiatric Association and the American College of Obstetricians and Gynecologists (Yonkers et al., 2009) reviewed all the extant literature on outcomes studies on anti-depressants during pregnancy and used the findings to formulate treatment guidelines for practicing clinicians. The report raises pertinent points about various confounding factors that have yet to be controlled for in the outcomes studies; these factors range from the presence of depression itself, maternal illness, and maternal health behavior. Even with the acknowledgement of these methodological shortcomings in the available studies, it was still suggested that pre-conceptional patients currently on medication who have mild depressive symptoms or have been asymptomatic for 6 months or more undergo medication taper and eventual complete medication discontinuation before conception is attempted.

Additionally, qualitative studies investigating pregnant women's thoughts on taking psychopharmaceuticals reveal that pregnant women themselves are hesitant about using

medications to treat their depression or anxiety during pregnancy and during the immediate postpartum period. One study found that only 35 percent of women in the perinatal phase would consent to the recommendation of taking psychopharmaceuticals to treat their depression (Goodman, 2009). A more in-depth, exploratory study of depressed women's preferences for mental health treatment during pregnancy revealed that women had the lowest confidence in antidepressant medications (O'Mahen & Flynn, 2008). Women who have recently given birth have raised concerns about safety during breastfeeding and the potential for side effects (i.e. drowsiness) to deter from parenting ability (Turner et al., 2008). A lack of non-pharmacological treatment options could be one reason why only 18 percent of pregnant women experiencing negative affective states seek treatment for their symptoms (Marcus, 2009).

Given the inconclusive empirical evidence on the safety of antenatal use of psychopharmaceuticals to treat maternal depression and anxiety, along with the professional and patient concern over their safety, finding non-pharmacological treatment modalities that are equally effective—but without possible deleterious effects on the developing fetus, neonate, and mother—is imperative to the overall health of mother and child. Furthermore, treating antenatal depression with psychopharmaceuticals may be replacing one risk factor with another: the potential adverse outcomes of psychopharmaceutical use during pregnancy are similar to that of untreated antenatal depression and/or anxiety. With the health of two individuals simultaneously threatened—the mother and the child—safe, effective treatments are all the more necessary.

1.3 NON-PHARMACOLOGICAL TREATMENTS FOR ANTENATAL DEPRESSION AND ANXIETY

Some alternative treatment options are currently available for pregnant women suffering from depression, such as electroconvulsive therapy (ECT) or increased omega-3 fatty acid intake. However, ECT itself is a controversial treatment modality for pregnant women suffering from depression. Effectiveness rates in preventing relapse of a depressive episode, albeit impressive, have been determined from case reports of physicians that have used ECT for their pregnant, depressed patients; no randomized controlled trials evaluating the use of ECT for pregnant women have been conducted (Anderson & Reti, 2009). Furthermore, reports of perinatal complications continue to surface in the literature, causing obstetrician/gynecologists to “conclude that there are insufficient data to support the American Psychiatric Association’s position that ECT has ‘low risk’ in all three trimesters of pregnancy” (Richards, 2007).

Research on omega-3 fatty acid intake for pregnancy women is in its infancy, but has yielded promising results. A small open trial of omega-3 fatty acids with depressed pregnant women showed decreases in depressive symptomatology as a result of omega-3 fatty acid intake (Freeman et al., 2006). The only randomized, double-blind, placebo-control trial to date of this alternative treatment for pregnant women with depression did report favorable outcomes: depressive symptoms significantly improved among women in the treatment group (Su et al., 2008). Larger replications of this trial are needed to address the issues of safety and psychotherapeutic effect for the woman. Furthermore, while non-pharmacological, omega-3 supplements are still an invasive form of treatment whose effects on the developing fetus and future neonate have not yet been empirically determined.

Non-invasive treatment options available include psychotherapy, bright light therapy, exercise, massage, and acupuncture. Psychotherapy appears to be effective, but is time consuming and not economically feasible for many women; exercise has only a slight effect on ameliorating depressive symptoms. In a Cochrane Collaboration review (Dennis & Allen, 2009) of non-pharmacological interventions for antenatal depression, it was determined that massage and acupuncture treatments did not significantly decrease depressive symptoms in pregnant women. In the same review, the methodology of a bright light therapy study did not even meet inclusion criteria for the review. As such, there is a need for additional non-invasive, effective treatments that pregnant women can choose from when deciding how to manage their depression and anxiety.

1.4 MINDFULNESS: AN OVERVIEW

Mindfulness is a practice rooted in Buddhist practice and philosophy, but its premise is simple and has a secular quality to it: nonjudgmental acceptance and awareness of the present moment. This is usually achieved through a meditative practice that focuses on the flow of the breath, and it is an actively engaged process. The final result of this practice and mindset is an existence characterized by non-attachment to thoughts, beliefs, and emotions, which consequently produces a mental state that is more balanced. Regular practice of mindfulness meditation can have lasting physiological changes on the body as well, even resulting in changes in brain activity. Thus, it is not surprising that regular practitioners of mindfulness report increased calmness and a general sense of overall physical and mental well-being.

Mindfulness as it is defined in this study is not to be confused with the Westernized versions of mindfulness that have developed in an attempt to make it more conducive to scientific inquiry. One Westernized approach towards mindfulness began with the rigorous study of mindlessness and the subsequent consequences that result from interacting with the world in a mindless psychological state; only after these experiments on mindlessness did the concept of mindfulness crystallize (Langer, 1989). Quite simply, mindfulness is the absence of mindlessness, according to this perspective. Cultivating mindfulness according to this conceptualization of mindfulness is not done through any semblance of meditative practice. Furthermore, this group of mindfulness researchers acknowledges that their definition of mindfulness may draw parallels between the Buddhist conceptualization of mindfulness, but they stress that their mindfulness is one entirely spawned out of the Western scientific paradigm.

Admittedly, one could argue that even those researchers who study Eastern mindfulness are bastardizing mindfulness—modifying it to make more congruent with Western ideology—by the mere fact of subjecting it to empirical study, but they do not attempt to make a distinction between Eastern and Western mindfulness. While they do extract mindfulness from the Buddhist religion to make it more palatable to Western practitioners, and oftentimes simplify or condense the meditative practice required to cultivate mindfulness, the essence of Eastern-originated mindfulness is steadfastly preserved and honored in their work.

1.5 MINDFULNESS APPLIED TO CLINICAL SETTINGS

Extensive practice is not required to cultivate mindfulness or to experience the benefits associated with its practice. Recent research has shown that mindfulness can be taught in a

condensed manner, and when applied to the health setting, mindfulness has a multitude of benefits (Ludwig & Kabat-Zinn, 2008). Patients, providers, and the overall quality of care delivered by medical professionals prosper in a myriad of ways from the introduction of mindfulness into clinical practice.

The particular condensed, clinical adaptation of mindfulness through which individuals in the health care setting enjoy the benefits of mindfulness is by administration of an empirically-tested intervention called mindfulness-based stress reduction (MBSR). Recipients of the intervention attend an 8-week, intensive training in mindfulness meditation intended to give participants the skills needed to cope with stress and other negative feelings in their everyday lives (Kabat-Zinn, 1993). MBSR is the mindfulness-based intervention that is gaining the most attention in the clinical realm, whether in practice or research. It has been used with patients in various health populations and with clinicians, and its effectiveness has been the subject of numerous research studies. However, it should be noted that there are other mindfulness-based interventions being used in clinical settings and subjected to empirical study. Some are not based on MBSR, while others may be a variation of MBSR.

Mindfulness-based interventions have been shown to be effective in reducing stress and facilitating coping in different populations suffering from various health problems: cancer, depression, anxiety, chronic heart failure, and chronic pain (Carlson et al., 2001; Teasdale et al., 2000; Evans et al., 2008; Sullivan et al., 2009; Kabat-Zinn, 1982). Participants in these studies received MBSR to help alleviate the negative affective states that oftentimes accompany physical morbidity, and their outcomes were compared with individuals who receive standard coping interventions for their respective physical malady. In addition to empirical support for MBSR reducing stress in patient populations, patient satisfaction with the intervention is also favorable

(Kievet-Stijnen et al., 2008). Satisfaction and reduction of negative affective states proved sustainable in 6-month and 1-year follow-up evaluations.

Burnout is a recognized phenomenon among practicing clinicians, and it is increasingly demanding the attention of medical professionals as a negative presence that needs to be remedied. The clinical work of clinicians experiencing burnout suffers, which not only puts patients' safety at risk, but diminishes the sense of satisfaction the patient has with the clinician-patient relationship (Vahey et al., 2004; Ratanawongsa et al., 2008). Burnt out clinicians even realize that the quality of care they provide to patients is substandard (Spickard et al., 2002). Physicians and other health care professionals who receive a mindfulness-based intervention for burnout-related symptoms have noted improved job satisfaction and reduced stress levels (Shapiro et al., 1998; Shapiro et al., 2005; Galantino et al., 2005). Hence, mindfulness has the potential to counter the occurrence of clinician burnout, which will ultimately lead to improved clinical work and patient satisfaction.

Mindfulness is associated with empathy (Beitel et al., 2005; Dekeyser et al., 2008), and, in addition to ameliorating stress, mindfulness has been shown to increase levels of empathy in medical students (Shapiro et al., 1998). In a model of developing healing relationships between clinician and patient, valuing—which entails the creation of a nonjudgmental emotional bond—is the foundation of the development of the healing relationship (Scott et al., 2008). Also, patients continually express a preference for doctors who are more compassionate and empathic: they want physicians that genuinely listen to their concerns (Jangland et al., 2009). Therefore, with compassion as a necessity and preference in the healing relationship between clinician and patient, integrating mindfulness into clinicians' practice could ensure the presence of this very important quality.

Another benefit to clinician mindfulness practice is a reduction in medical errors. Malpractice as a result of poor judgment, oversight, and perfunctory responses to common illnesses or disorders is common (Kachalia et al., 2007). The majority of these missteps could easily have been prevented, as they were not the result of incompetence, but rather inattentiveness and routinized behavior (Groopman, 2007). Groopman further suggests that one possible approach to counter these “cognitive traps” is to adopt a self-reflective style of thinking that is similar to mindfulness.

Mental health practitioners are also employing the philosophy of mindfulness to help treat mental and behavioral health disorders. Evidence-based treatments such as Dialectical Behavioral Therapy and Acceptance and Commitment Therapy infuse certain components of their treatment protocols with mindfulness-based exercises and philosophy (Linehan, 1993; Hayes et al., 1999). Mental health patients who received treatment from a clinician trained in mindfulness showed more symptom reduction on indices of anxiety than did patients treated by a clinician with no mindfulness training (Grepmaier et al., 2007). However, these treatments do not use mindfulness as the predominant theoretical framework to guide their treatment protocols, making it difficult to discern if the therapeutic effect can be solely attributed to the mindfulness component. The empirical support for another form of therapy called Mindfulness-based Cognitive Therapy may be better suited to determining the effects of mindfulness on one’s mental and behavioral health.

Controlled research trials of Mindfulness-based Cognitive Therapy (MBCT)—an innovative adaptation of Cognitive Behavioral Therapy—are providing empirical support that mindfulness-based therapeutic interventions are effective in preventing relapses of depressive episodes (Kuyken et al., 2008). MBCT combines mindfulness-based stress reduction with

cognitive behavioral therapy to teach patients with major depression to become aware of internal sensations and thoughts that accompany the onset of a depressive relapse. Kuyken et al. (2008) found that MBCT is equally as effective as anti-depressant medications in preventing relapse and superior to anti-depressants on quality of life measures. Mindfulness-based approaches to treatment have also shown effectiveness in treating substance abuse: substance abusers who received a mindfulness meditation intervention showed significant decrease in the amount of chemical substances (alcohol, marijuana, and crack cocaine) consumed (Bowen et al., 2006).

1.6 MINDFULNESS APPLIED TO DEPRESSED OR ANXIOUS PREGNANT WOMEN

Mindfulness-based stress reduction has been shown to reduce elevated levels of cytokines in other populations experiencing stress, anxiety, and depression (Witek-Janusek et al., 2008). Recall from the previous discussion of the adverse birth outcomes associated with stressed and/or depressed pregnant women that heightened level of cytokines in their blood is drawing the attention of researchers as a potential casual pathway for the reported negative birth outcomes (Coussons-Read et al., 2007). Consequently, there is a strong possibility that mindfulness-based stress reduction would have a similar, positive impact on the immune response of stressed, anxious, and/or depressed pregnant women. Emerging studies are providing empirical evidence for the inferred benefits mindfulness-based interventions could afford pregnant women suffering from depression and/or anxiety.

One study investigated the effectiveness, feasibility, and acceptability of a yoga program infused with mindfulness-based stress reduction for pregnant women experiencing elevated

levels of distress (Beddoe et al., 2009). The results indicated that the program assuaged women's stress and anxiety in their third trimester of pregnancy, and most participants were amenable to the mind-body approach of the intervention. However, due to the combination of yoga and mindfulness-based stressed reduction, it is difficult to discern what aspect of the program contributed to these favorable results: was it the yoga component or the mindfulness component, or the combination of both?

In a recent pilot study among pregnant women (Vieten & Astin, 2008), a mindfulness meditation intervention was developed to reduce depressive symptoms during pregnancy and the early postpartum period. The intervention is called Mindful Motherhood, and it uses a three-pronged approach towards cultivating mindfulness in the expectant mother: breath awareness to promote mindfulness of thoughts and feelings, guided body awareness to promote mindfulness of body, and acceptance and cultivation of an observing self. The results of the study showed that women who received Mindful Motherhood reported significantly decreased anxiety and negative affect when compared to wait-list controls.

Pregnant women themselves seem to want the availability of a treatment option that includes meditative practices. In a focus group study intended to elicit depressed pregnant women's attitudes and thoughts on treatment and treatment preferences, women expressed the desire to have treatment options to choose from to manage their depressive symptoms that included meditation or yoga (Jesse et al., 2008). It should be noted that participants were not asked specific questions about their preference for treatment options that included a meditative component; this response pertaining to meditation was therefore unprompted and non-iatrogenic, entirely the preference of the participant.

While not yet empirically studied, teaching mindfulness-based interventions to antenatally depressed or anxious mothers could also potentially act as a protective or mediating factor in relation to the development of post-partum depression. As mentioned previously, antenatal depression or anxiety is often a risk factor for subsequent development of post-partum depression. A non-invasive method for treating antenatal depression or anxiety that also acts as a preventative measure would be an efficient and cost-effective way to combat two threats to maternal and child health.

Despite a dearth of research on mindfulness-based interventions for depressed and/or anxious pregnant women, it appears that mindfulness-based interventions have the potential to be an effective, non-invasive treatment for women experiencing anxiety and depression during pregnancy. Considering the burgeoning amount of evidence of mindfulness-based interventions' effectiveness with other populations, the likelihood these interventions would have the same beneficial effect on this specific population is good.

Attenuating anxiety and depression in pregnant women is important given the large body of empirical evidence that anxiety and depressed mood during pregnancy are correlated with adverse birth outcomes (Dayan et al., 2002; Borders et al., 2007). Given the inconclusive evidence in regard to the safety of psychopharmaceutical treatment for antenatal depression or anxiety, a non-invasive approach to treatment like mindfulness-based interventions could be a safe, effective alternative to pregnant women suffering from depressive or anxious symptoms. Additionally, a non-psychopharmaceutical, non-invasive treatment for depressed or anxious pregnant women to choose from responds to their preference for the availability of this type of treatment option.

1.7 PROVIDER ADOPTION OF MINDFULNESS TO TREAT DEPRESSION AND ANXIETY

With the promising evidence that mindfulness-based stress reduction is an effective, non-invasive means to treat maternal depression and anxiety, the next step is to successfully disseminate the practice of using mindfulness-based stress reduction with the population of depressed and anxious expectant mothers. Successful dissemination begins with an understanding of the perspectives and attitudes towards the intervention of those who will be administering or practicing the intervention (Aarons, 2005). By discussing mindfulness interventions with prenatal care providers, it can help predict the likelihood that mindfulness will be adopted as part of routine practice by clinicians, as well as to determine whether there are barriers to clinician support of mindfulness as a treatment option for pregnant women with negative emotional states. There are no studies in the extant literature that provide information on the attitudes towards mindfulness of any type of clinician—obstetrician/gynecologists or midwives—that provides care to pregnant women.

Mindfulness is often considered a complementary intervention to mainstream modes of clinical practice. Complementary treatments are anything “not currently part of the dominant or conventional medical system” (Allaire et al., 2000). The extant literature pertaining to the integration of complementary treatments with prenatal care and birthing services reveals that midwives—not obstetrician/gynecologists—are more likely to incorporate complementary treatments into their practice. One study revealed that complementary treatments were recommended by 93 percent of midwives within the past year, and 57 percent of midwives used complementary methods to treat more than 10 percent of their pregnant patients (Allaire et al., 2000). The same study also found that midwives use mind-body interventions to treat anxiety

and stress in their pregnant patients, such as biofeedback and hypnosis; mindfulness was not mentioned. Not surprisingly, qualitative studies done on midwives' perspectives and attitudes towards using complementary treatments report favorable attitudes towards supplementing standard practice with complementary treatments (Adams, 2006; Williams & Mitchell, 2007).

No studies have been done specifically investigating midwives' use and perceptions of mindfulness and mindfulness-based interventions in the clinical setting. The evidence pertaining to use and perspectives towards complementary medicine suggests that midwives' would most likely be receptive to incorporating mindfulness philosophy and interventions into their practice. In particular, it also implies that midwives would be amenable to using or recommending mindfulness-based interventions for their depressed and/or anxious patients.

In addition to the classification of mindfulness as a complementary treatment modality—which midwives endorse and practice—there are certain philosophical similarities between midwifery practice and mindfulness that render the fusion of the two disciplines conceivable. Midwives are known for their more holistic, humanistic approach to pregnancy and the birthing process, placing emphasis on being present with the woman during child birth (Cragin, 2003). To reiterate from the previous overview of mindfulness, one component of the essence of mindfulness is full awareness of and immersion in the present moment. Midwifery also champions a non-judgmental, empathic honoring of the woman's needs and care requests, often encouraging assuming the perspective of the woman (Cragin, 2003). A tenet of mindfulness similar to this tenet of midwifery is the non-judgmental experience of the present moment. These philosophical similarities between midwifery and mindfulness suggest that the two would fit well together in a commensal relationship of sorts, with the field of midwifery benefiting from the constant presence and influence of mindfulness.

A complementary treatment such as a mindfulness-based intervention is also a non-invasive form of treatment for depression and/or anxiety. Another tenet of midwifery practice is the approach of least intervention: midwives strive to act in a manner that is not invasive to the experience of pregnancy and birth. Therefore, a non-invasive approach such as mindfulness-based interventions in managing pregnant women's depression and/or anxiety would most likely be embraced by practicing midwives. Pregnant women themselves also prefer non-invasive forms of managing depression or anxiety, and midwives would readily honor this preference given it is part of midwifery credo to respect the prenatal care preferences and decisions of the women they provide care to.

Hence, the philosophical similarities of midwifery and mindfulness suggest a plausible marriage of the two disciplines, but without any research on the topic, the likelihood of such a union is difficult to predict. It is curious that the relationship between midwifery and mindfulness has not been given more attention by researchers. This study addressed the gap in the literature pertaining to the perspectives of midwives towards using mindfulness in their clinical practice and to help their patients suffering from depression and/or anxiety.

1.8 THEORETICAL FRAMEWORK

In addition to being a complementary practice, mindfulness is also an innovative practice, even though its origins are steeped in ancient philosophical beliefs and religious practices. Innovations are any interventions that are perceived as new by the majority in a particular field; using mindfulness to supplement and enhance clinical practice is a new concept to many clinicians. As such, using Diffusion of Innovations theory (Rogers, 2003) to conceptualize the uptake of

mindfulness in clinical settings is a useful way to predict the course of its implementation. According to Diffusion of Innovations theory, adoption depends on the characteristics of the individuals that will be using the intervention: the adopters (Rogers, 2003). In the case of the proposed study, midwives occupy the role of adopter.

There are five categories of adopters: innovators, early adopters, early majority, late majority, and laggards. Each category has a unique set of characteristics that individuals embody as adopters. Innovators are defined by their venturesomeness and a position of notable leadership and influence in their respective fields. Early adopters reduce suspicion or uncertainty about an innovation by adopting it; this bold decision acts as a catalyst to others adopting the innovation. The early majority mull over the prospect of adopting an innovation, adopting new ideas not that long before the average member of the system. The late majority have a high degree of skepticism towards the innovation, delaying their adoption of the innovation until just after the average member. Finally, laggards are synonymous with the past; they are resistant to change, and are the very last to adopt the innovation, if they adopt it at all. It is hypothesized that midwives will possess the characteristics common to early adopters.

The information gathered from this exploratory, qualitative study can be used to guide the implementation efforts of the innovative treatment modality of mindfulness among pregnant women to improve birth outcomes. It is also the first study to examine practitioner perspectives on using mindfulness in clinical settings, and could serve as a catalyst to more research being conducted on this topic. Implementation initiatives of other mindfulness interventions for various health conditions and populations would benefit from such information. Therefore, gaining an increased understanding of adoption and implementation of mindfulness is a pioneering step

towards maximizing the potential of mindfulness to improve maternal and child health, and public health in general.

2.0 METHOD

Participants were practicing midwives (N = 6) in Western Pennsylvania and Vermont. Originally, 12 midwives were contacted to participate in the study. Of the 12, 6 consented to participation. Midwives were varied in the type of clinical setting in which they worked: some midwives worked in a hospital setting under collaborative agreements with obstetrician/gynecologists and some midwives worked in independent midwifery clinics. A regional representative of a midwife organization in Pennsylvania volunteered to help recruit midwives for the study. She made fellow midwives aware of the study via a list serve announcement; interested midwives contacted the principal investigator via e-mail. The regional representative also offered to have the principal investigator attend a monthly midwife meeting to recruit more participants. The principal investigator attended the meeting and gave a very brief description of the study to the group. Names and contact information were collected from midwives who were interested in participating in the study. Vermont midwives were recruited via a connection one of the investigators had with one of the midwives. The principal investigator e-mailed all interested midwives, providing them with more information on the study, and all study documents: informed consent and a scholarly article on mindfulness. If the midwives did indeed want to participate in the study, they signed and returned the informed consent form to the principal investigator. An interview time was then arranged that was convenient for the participant.

Individual phone interviews were conducted with each midwife to gather information on their perspectives on using mindfulness in clinical practice. Interviews lasted no more than 20 minutes, and were conducted with the aid of an interview guide designed before inception of the study. The interview questions were intended to elicit the midwives' overall perspective on mindfulness by addressing five specific aspects of mindfulness and clinical settings: 1.) mindfulness's fit with general clinical practice, 2.) mindfulness's fit with midwifery practice, 3.) mindfulness's impact on the midwives' personal practice, 4.) mindfulness's effectiveness in intervening with depressed or anxious women, and 5.) barriers that may impede the use of mindfulness in clinical settings. Examples of questions include "How does mindfulness specifically relate to clinical practice as a midwife?" and "How do you think mindfulness-based interventions will affect your pregnant patients' anxiety and depression levels?" The interview guide was designed by the Principal Investigator and refined with the input of a professional who had prior experience with conducting phone interviews for research purposes.

During the course of the interviews, interviewers took detailed notes of the responses from the midwives. The midwives were instructed to read the peer-reviewed article on mindfulness before the interview. The purpose of the article was twofold: 1.) to provide the midwives with a primer on what mindfulness is and how it is currently being applied to the clinical setting and 2.) to promote a standardized conceptualization of mindfulness across the participants. University of Pittsburgh Institutional Review Board approval was obtained prior to initiation of the study.

Field notes of the interviews were analyzed using a grounded theory approach. One member of the research team read through the field notes, looking for recurring themes that emerged, and a codebook was subsequently developed. Two members of the research team

independently coded the interview content according to the codebook. The coding team's coding decisions were then discussed in order to obtain consensus. In situations where there was a discrepancy between how the coders coded a particular piece of data, the coders discussed the content until a consensus was reached. Original themes were finalized using a constant comparative method, and themes were expanded, collapsed, or eliminated accordingly.

3.0 RESULTS

For each of the five aspects of mindfulness that were inquired about, predominant themes emerged upon analysis of the interview content. More detailed explanations of the themes with relevant exemplars are provided below.

3.1 MINDFULNESS'S FIT WITH GENERAL CLINICAL PRACTICE

Three predominant themes were discussed by the midwives in relation to how they thought mindfulness may be useful in general clinical practice. They thought it would be Useful in Decision Making, Increase Patient Attention, and Minimize Rushing. Decision making was seen as something that would benefit from incorporating mindfulness into general clinical practice. One midwife commented *“For more accurate diagnosis and decisions, mindfulness is key.”* Another midwife thought that mindfulness would *“help to get better information from [the] patient and [contribute to] making better decisions.”*

Midwives also thought that a mindfulness-centered approach would increase the amount of quality attention they gave to their patients. One midwife thought that mindfulness *“could be helpful during a busy day, to be with a woman and her family, and being present and making the family feel heard, so they can fully discuss health and birth-related issues.”* Another midwife

echoed the same sentiments, simply stating that mindfulness could help to “*take time and listen to the person*” you are treating at the time.

Finally, midwives expressed the feeling that mindfulness would help minimize the rushed pace at which their work oftentimes functioned. One midwife stated that mindfulness “*would help with rushing in between visits.*” One midwife who had previously adopted a mindfulness-based approach to her practice shared that “*patients felt they weren’t rushed and that the clinicians were focused on them.*”

3.2 MINDFULNESS’S FIT WITH MIDWIFERY

Three predominant themes surfaced upon analysis of midwives’ views on mindfulness’s relevance to midwifery practice. These themes were Philosophical Similarity, Increased Efficiency, and Facilitates Focus. Many midwives noted the similarities in the philosophical approaches of mindfulness and midwifery. One midwife said that “*mindfulness is a nebulous thing, but part of midwife philosophy. If [one] can incorporate [mindfulness], it would help with this (being true to the midwife philosophy).*” Another midwife had a similar point of view, as revealed by her comment: “*Midwifery philosophy is based on being with a woman, and seeing things from her point of view. Mindfulness fits with the philosophy of being a midwife.*”

Midwives also felt that mindfulness would enhance the efficiency of their work, in timeliness and process. A midwife whose practice did incorporate some mindfulness approaches admitted that by using mindfulness, she “*finds that appointments only take 40 minutes, instead of an hour, and it helps get to the point faster, eliminating unnecessary chitter chatter.*” Another midwife who already uses a mindful approach to practice said that it helps to “*pick up*

complications sooner and be more accurate and timely in addressing these complications.” Another midwife thought that mindfulness would *“help to make sure she wasn’t missing things”* during appointments. Yet another midwife asserted that mindfulness *“will help to act for a good reason, not acting for the sake of acting, and this will help to improve outcomes.”*

Midwives also discussed the importance of mindfulness in helping the busy midwife stay focused on the task at hand before her. One midwife spoke about how *“working in hospitals with 4 women laboring at a time, it’s hard to focus on 1 patient when there are 3 others. [Mindfulness] helps to be present with the woman during labor...”* Another midwife thought that mindfulness would *“promote focused multi-tasking.”* Yet another midwife reiterated the feeling that mindfulness promotes focus, saying that mindfulness *“helps to focus on what needs to be done.”*

3.3 MINDFULNESS AND MIDWIVES’ PERSONAL PRACTICE

Three main themes emerged in relation to how midwives thought mindfulness would impact them individually in their own personal practice as a midwife: Increased Satisfaction, Promotes Clarity, and Fosters Empowerment. Midwives thought that mindfulness would increase their personal satisfaction with their work and consumer’s satisfaction with the services that they received. One midwife said that it *“would lead [her] to feel more satisfied and less burnt out.”* Another midwife thought mindfulness *“would be ideal if it could be used in all situations, [resulting in] better consumer satisfaction.”* Mindfulness was also seen by midwives as a means through which to enhance clarity during the course of a chaotic workday. One midwife commented that mindfulness *“allows for inner peace in the midst of chaos and crisis, helping to*

bring clarity.” Another midwife shared this view of mindfulness promoting clarity “in the context of swirling around, and chaos, around and underneath you.”

Midwives felt that mindfulness would help them foster a sense of empowerment in their patients. If embodying the approach of mindfulness, one midwife felt that she would *“be able to help the patient make sound decisions. The patients will be able to make their own choices in a non-judgmental way, and will be more likely to follow through on the decisions that they make.”*

Another midwife thought that mindfulness *“lets women identify fears that are theirs, in the present,... sweeping out fears related to culture, medical society, mothers, TV, etc.”*

3.4 MINDFULNESS’S EFFECTIVENESS WITH DEPRESSED OR ANXIOUS PREGNANT WOMEN

Two main themes were discovered pertaining to midwives’ thoughts on the impact of using mindfulness with their depressed or anxious patients. These themes were Optimistic Uncertainty and Calming Effect. Some midwives had an uncertain, yet optimistic view as to whether or not mindfulness would help their depressed or anxious patients. This theme is probably best represented by a midwife who admitted that she *“didn’t know, but thinks [mindfulness] would be helpful”* in alleviating negative affective states in pregnant women. Similarly, another midwife said that using mindfulness with depressed or anxious pregnant women would *“probably would help quite a lot,”* but that she *“doesn’t know how [she’d] exactly use it.”* The same midwife said that, given her uncertainty, she *“would like to make referrals to therapists who have a mindfulness background,”* rather than address the anxiety or depression in her patients herself,

but if “*easy tools, such as handouts or a specific exercise*” were available, this might give her a clearer idea of how to use mindfulness herself.

Midwives who were not uncertain about mindfulness’s utility in intervening with depressed or anxious pregnant women thought that it would have a calming effect on the women. One midwife offered that “*a calmer, cleaner space (attributed to mindfulness) will lead to reduced anxiety.*” Another midwife thought mindfulness would have a positive, calming effect “*by eliminating fears that don’t belong to [the women].*” Yet another midwife posited that by “*spending more time talking and listening to the patient would calm them, and would also add reassurance and help relieve their fears.*”

3.5 BARRIERS TO USING MINDFULNESS IN CLINICAL SETTINGS

Two main themes were mentioned by midwives when discussing their thoughts on barriers to implementing mindfulness in clinical settings: Acceptability and Lack of Skill. Many of the midwives doubted that mindfulness would be accepted by their colleagues, patients, or those in more administrative healthcare positions. One midwife attributed this closed-mindedness to the recent trend and push towards evidence-based practice in clinical settings: “*Mindfulness would get in the way of the push for evidence-base. Midwives are already considered a nebulous thing; using something that has no evidence of effectiveness may turn some people off.*” Some midwives saw the lack of acceptability as the result of being unfamiliar with the concept of mindfulness, as described by one midwife: “*The vocab would be uncomfortable to them, and they would think it’s amusing, but nothing more.*” Another midwife also thought that “*some people might not have the background, so it would be hard to explain, and might not be*

accepted.” The philosophy of mindfulness itself is another factor that midwives thought would contribute to unwillingness to adopt its practices. One midwife said that *“for some people, the idea of taking time out, they would react to this.”* The same midwife also thought that *“the idea of something based in Eastern philosophy”* would make mindfulness less acceptable to some people.

Lack of Personal Skill in their ability to practice mindfulness themselves also was mentioned by midwives as a potential barrier or concern when using mindfulness in clinical settings. One midwife candidly admitted that her *“skills aren’t good enough and [she] would like to hone [her] mindfulness skills.”* Another midwife was comparably blunt, saying that she *“would like training, that [she] has trouble being in the here and now, [her] mind is all over the place.”*

4.0 DISCUSSION

Antenatal depression and anxiety are significant public health problems that require medical attention. Treating depression and anxiety during pregnancy is imperative to the health of the mother and child. Currently, the most common treatment modality is psychopharmaceuticals, but a plethora of outcomes studies on using psychotropic drugs to treat depressed or anxious women is revealing potential adverse outcomes for the mother, fetus, infant, and older child. Furthermore, pregnant women themselves are expressing a preference for non-psychopharmaceutical treatment of their depression or anxiety.

Alternative treatments to anti-depressant and anti-anxiety medications do exist, but their efficacy is questionable, as well as the safety of some of them. Mindfulness-based interventions show promise for being an effective, non-invasive means of managing negative affect states such as depression and anxiety. As an innovative approach to treating depression and anxiety, it has not yet been widely disseminated in clinical settings, nor has attention been given to predicting the likelihood that it would be adopted by clinicians who provide maternal and child health care. The attitudes towards a treatment modality of those who will be implementing the treatment greatly influence the implementation efforts. The present study explored midwives' perspectives on mindfulness and using mindfulness-based interventions with their depressed and anxious patients.

The results of the study indicated that midwives were extremely receptive to the general concept of mindfulness and integrating it into the clinical setting. Such an open-minded attitude bodes well for the potential adoption of an innovative clinical venture, such as fusing an Eastern-based practice—mindfulness—with Western medicine. Furthermore, many midwives thought that using mindfulness with their depressed or anxious patients would have a calming effect on the psychosocial state of the women. Midwives' general receptivity to mindfulness philosophy coupled with their specific positive attitude towards mindfulness for depressed or anxious pregnant women suggests the adoption of mindfulness by midwives would be smooth.

And while some midwives expressed an uncertainty about how they would use mindfulness to help their patients suffering from depression or anxiety, it was an optimistic uncertainty: they were unsure of how it would impact them, but believed it would most likely have a positive, beneficial effect. Having tools—such as specific mindfulness exercises—were even mentioned as something the midwives would like to have in their repertoire of clinical skills to use with their depressed or anxious patients. Hence, it is likely that any mindfulness-based interventions developed for alleviating depression and anxiety in pregnant women would be successfully implemented by midwives.

However, serious consideration should be given to the comment one midwife made about feeling more comfortable referring depressed or anxious patients to therapists with a mindfulness-based approach to treatment, rather than the midwives attempting to intervene on their own. If anxiety is transient, and more of a reaction to fears and uncertainty over pregnancy and birth, then it seems acceptable to encourage midwives to use mindfulness-based approaches to attenuate this manifestation of anxiety. Many midwives in the study acknowledged that they do see patients who are nervous or anxious about pregnancy-related issues, and that a

mindfulness-based approach may help to address these anxieties and fears, ultimately extinguishing them.

However, anxiety that has a more chronic and severe quality to it—as well as any depressive symptoms midwives may observe in their patients—should be treated with the help of a trained psychologist or psychiatrist. Midwives could build screening for depression or anxiety into part of their regular routine during appointments, referring women to mental health professionals as they deem appropriate. Such a clinical practice seems to be a feasible request to make of midwives.

One study exists that examined the role of midwives and nurses in screening for depression, with the specific intent of early detection of post-partum depression (Hanna et al., 2004). The midwives involved in the study reported favorable attitudes towards incorporating screening into their practice, and felt screening for depression and anxiety during pregnancy was a very important clinical procedure to adopt. Midwives were also commendable in their reaction to discovering their patients were experiencing symptoms of depression or anxiety: 60 percent of the midwives' patients were counseled about depression or anxiety, and 31 percent were referred to a mental health professional by the midwives.

A collaborative relationship between midwives and a mindfulness-based cognitive therapist could also be formed, helping to enhance the mental health care depressed and/or anxious pregnant women receive. Midwives could inquire about current mood and mental state in their routine visits with women, and if a patient is experiencing symptoms during the visit, the midwife could do a brief mindfulness exercise recommended by the therapist with the patient. This additional, outside use and application of the mindfulness skills the patient is learning from

their therapist in treatment sessions would help to habituate the practice in the everyday lives of the patient.

The analysis of the data also produced results not specifically intended as an aim of the study: the findings hold broader implications for midwifery practice. According to the responses of the midwives, a more formalized mindfulness-based training for future and current midwives may enhance the quality of the services they provide while simultaneously helping midwives to embody the spirit and philosophy of midwifery more fully. Cragin (2004) outlines three characteristics of the midwifery approach to care: 1.) the acknowledgement of a mind/body connection, 2.) honoring the woman's perspective in relation to symptoms and care, and 3.) perceiving and preserving pregnancy and childbirth as a normal process, to only be interfered with unless absolutely necessary.

Mindfulness was viewed by the midwives as almost an integral part of their role as a midwife, a foundation that would allow them to uphold the components of Cragin's midwifery paradigm. Many midwives in the present study thought that mindfulness would help them to be with a woman during labor, to be present with her, and to be non-judgmentally aware of her perspective. Midwives also expressed the belief that mindfulness would help them to only intervene when truly necessary. Hence, an inherent relationship seems to exist between mindfulness and midwifery that should perhaps be given more dedicated, concentrated efforts to develop into a tangible union, rather than it remain a theoretical overture.

Expanding and applying the results even broader, they also hold implications for clinical practice/adoption of mindfulness in general clinical practice. The midwives felt that adopting a mindfulness-based approach to one's clinical practice would be conducive to better decision-making and more efficient practice. The comment by one midwife about the effect using a

mindfulness-based approach has on appointment duration is most intriguing: by slowing down and being in the moment, appointment length actually decreases. Conducting shorter appointments during which optimal service is provided is perhaps the ultimate goal of clinical practice, especially considering the high rates of overburdened clinicians and increasing patient dissatisfaction with the interactions they have with their providers during office visits.

Furthermore, the midwives' thoughts that mindfulness would be a protective factor against burnout and increase patient satisfaction are congruent with the nascent empirical support for mindfulness-based interventions effectiveness in reducing clinician burnout. It should be noted that no studies have been done assessing the effectiveness of mindfulness-based interventions in reducing stress and burnout-related symptoms in the midwife population, despite the occurrence of burnout in the midwifery field (Beaver et al., 1986).

Future quantitative studies of mindfulness in clinical settings could investigate clinical outcomes and patient satisfaction among clinicians—midwives included—who consistently and consciously apply mindfulness techniques and approaches to their clinical work. Replication of the positive findings from previous studies on mindfulness-based interventions and clinician burnout should be conducted as well. Empirical evidence for the conjectures pertaining to clinical outcomes is essential to adding credibility to mindfulness's role in clinical settings.

Revisiting the Diffusion of Innovations theory and framing the results within the components of the theory adds yet another dimension to the results. As mentioned previously, midwives were unanimously favorable to the idea of mindfulness and applying it to the clinical setting. Therefore, in a broader adoption of mindfulness, midwives do indeed occupy the role of Early Adopter, as predicted. However, when specifically asked about mindfulness-based interventions to use with their depressed and anxious patients, midwives seemed more skeptical

of this application of mindfulness in clinical practice. This reticence towards a more specified application of mindfulness aligns the midwives more with the Early Majority category. Future studies could delve deeper into this apparent uncertainty over using mindfulness-based interventions with pregnant women burdened with depression or anxiety.

The barriers mentioned by the midwives could be explored further and then addressed by those who plan on launching implementation initiatives of mindfulness-based interventions in clinical settings. In terms of the barrier of acceptability of mindfulness, clinicians could be surveyed beforehand to elicit their existing views towards using mindfulness in clinical settings. If clinicians predominantly seem to oppose the use of mindfulness in clinical settings, this would be a good indicator that the implementation effort would probably not be successful. As such, time could be devoted prior to moving forward with the initiative to understand these skeptical attitudes, and possibly attempting to shift the views of mindfulness to one with a more positive tilt. If the skepticism seems particularly entrenched and resistant to change, then embarking upon a mindfulness-based intervention implementation effort would be better attempted elsewhere, at a different practice with different, more receptive professionals.

The barrier relating to clinician lack of skill in practicing mindfulness could rather easily be countered with an intensive mindfulness training for clinicians to develop and bolster their skills; midwives themselves could attend a mindfulness-based stress reduction clinic. The benefits of attending the intensive training would be two-fold for the midwives: their mindfulness practitioner skills would improve and, indirectly, their clinical practitioner skills would improve. With their mindfulness skills enhanced, midwives would feel more confident in their ability to apply these skills to their clinical practice. This would also facilitate any accompanying implementation initiatives.

4.1 LIMITATIONS

Given the similarity between the philosophies of mindfulness and midwives, it is not surprising that midwives seemed very amenable to adopting mindfulness in the clinical setting. The very specialized population studied renders using the results to predict other clinicians' and healthcare workers' attitudes towards mindfulness in clinical settings difficult. The perspectives of a different population of clinicians in maternal and child health—and clinicians in other specialized areas of health service—should be obtained. Additionally, the small sample size compromises the salience of the themes that emerged from the data.

Studying the topic of mindfulness is in and of itself a limitation: outlining a clear operational definition for mindfulness has been a challenging task for researchers (Rapgay & Bystrisky, 2009). Even though the midwives were given a scholarly article in a peer-reviewed journal that described mindfulness in clinical settings, it is difficult to discern whether or not each midwife had the same understanding of what mindfulness is; it is very likely that mindfulness could mean different things to different people, especially those not well versed in it or who have had minimal exposure to its philosophy and practices. However, it should be noted that the majority of midwives interviewed had an extensive to moderate knowledge of mindfulness prior to the study and reading the article.

4.2 CONCLUSION

Despite these limitations, the results yielded from this exploratory study are still pertinent to the literature on mindfulness as a complementary treatment modality for pregnant women suffering

from depression or anxiety. Any mindfulness-based interventions developed for alleviating symptoms of depression and anxiety in pregnant women may be best implemented by midwives. Furthermore, the findings may serve as an impetus to conducting future, more extensive and broadly-scoped studies of clinicians' perspectives on using mindfulness-based interventions and a mindfulness approach to clinical work.

Evidence is amassing in the literature that suggests mindfulness and mindfulness-based interventions impart numerous benefits when applied to the clinical setting. Clinicians and patients alike have been shown to enjoy the positive effects that mindfulness produces. In particular, a mindfulness-based intervention may be a promising non-invasive alternative for managing depression and anxiety in pregnant women. Having the support of those who would be administering the intervention is essential to successful adoption and implementation of mindfulness in clinical settings. The present study shows support among a particular subset of clinicians for using mindfulness in clinical settings and practice.

BIBLIOGRAPHY

- Aarons, G. A. (2005). Measuring provider attitudes toward evidence-based practice: consideration of organizational context and individual differences. *Child and Adolescent Psychiatric Clinics of North America, 14*(2), 255-271.
- Adams, J. (2006). An exploratory study of complementary and alternative medicine in hospital midwifery: models of care and professional struggle. *Complementary Therapies in Clinical Practice, 12*, 40-47.
- Allaire, A. D., Moos, M. K., & Wells, S. R. (2000). Complementary and alternative medicine in pregnancy: a survey of North Carolina certified nurse-midwives. *Obstetrics and Gynecology, 95*, 19-23.
- Allister, L., Lester, B. M., Carr, S., & Liu, J. (2001). The effects of maternal depression on fetal heart rate response to vibroacoustic stimulation. *Development Neuropsychology, 20*(3), 639-651.
- Anderson, E. L., & Reti, I. M. (2009). ECT in pregnancy: A review of the literature from 1941 to 2007. *Psychosomatic Medicine, 71*, 235-242.
- Andersson, L., Sundstrom-Poromaa, I., Bixo, M., Wulff, M., Bondsestam, K., & Astrom, M. (2003). Point prevalence of psychiatric disorders during the second trimester of pregnancy: a population based study. *American Journal of Obstetrics and Gynecology, 189*, 148-154.

- Beaver, R. C., Sharp, E. S., & Cotsonis, G. A. (1986). Burnout experienced by nurse-midwives. *Journal of Nurse-Midwifery*, 31(1), 3-11.
- Beddoe, A. E., Yang, C. P., Kennedy, P., Weiss, S. J., & Lee, K. A. (2009). The effects of mindfulness-based yoga during pregnancy on maternal psychosocial and physical distress. *JOGNN*, 38, 310-319.
- Beitel, M., Ferrer, E., & Cecero, J. J. (2005). Psychological mindedness and awareness of self and others. *Journal of Clinical Psychology*, 61(6), 739-750.
- Borders, A. E. B., Grobman, W. A., Amsden, L. B., & Holl, J. L. (2007). Chronic stress and low-birth weight neonates in a low-income population of women. *Obstetrics and Gynecology*, 109, 331-338.
- Boucher, N., Bairum, A., & Beaulac-Baillargeon, L. (2008). A new look at the neonate's clinical presentation after in utero exposure to antidepressants in late pregnancy. *Journal of Clinical Psychopharmacology*, 28(3), 334-339.
- Bowen, S., Witkiewitz, K., Dillworth, T. M., Chalwa, N., Simpson, T. L., Ostafin, B. D., et al. (2006). Mindfulness meditation and substance use in an incarcerated population. *Psychology of Addictive Behaviors*, 20(3), 343-347.
- Carlson, L. E., Ursuliak, Z., Goodey, E., Angen, M., & Speca, M. (2001). The effects of a mindfulness meditation-based stress reduction program on mood and symptoms of stress in cancer outpatients: 6-month follow-up *Support Care Cancer*, 9, 12-123.
- Chambers, C. D., Hernandez-Diaz, S., Van Marter, L. J., Werler, M. M., Louik, C., Jones, K. L., et al. (2006). Selective serotonin-reuptake inhibitors and risk of persistent pulmonary hypertension of the newborn. *New England Journal of Medicine*, 354(6), 579-587.

- Chung, T. K. H., Lau, T. K., Yip, A. S. K., Chiu, H. F. K., & Lee, D. S. T. (2001). Antepartum depressive symptomatology is associated with adverse obstetric and neonatal outcomes. *Psychosomatic Medicine*, *63*, 830-834.
- Cobo, T., Palacio, M., Navarro-Sastre, A., Ribes, A., Bosch, J., Filella, X., et al. (2009). Predictive value of combined amniotic fluid proteomic biomarkers and interleukin-6 in preterm labor with intact membranes. *American Journal of Obstetrics and Gynecology*, *200*, 499e491-499e496.
- Coussons-Read, M. E., Okun, M. L., & Nettles, C. D. (2007). Psychosocial stress increases inflammatory markers and alters cytokine production across pregnancy. *Brain, Behavior, and Immunity*, *21*, 343-350.
- Coussons-Read, M. E., Okun, M. L., Schmitt, M. P., & Giese, S. (2005). Prenatal stress alters cytokine levels in a manner that may endanger human pregnancy. *Psychosomatic Medicine*, *67*, 625-631.
- Cragin, L. (2004). The theoretical basis for nurse-midwifery practice in the United States: a critical analysis of three theories. *Journal of Midwifery and Women's Health*, *49*(5), 381-389.
- Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., et al. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine*, *65*, 564-570.
- Davis, R. L., Rubanowice, D., McPhillips, H., Raebel, M. A., Andrade, S. E., Smith, D., et al. (2007). Risk of congenital malformations and perinatal events among infants exposed to antidepressant medications during pregnancy. *Pharmacoepidemiology and Drug Safety*, *16*, 1086-1094.

- Dayan, J., Creveuil, C., Herlicoviez, M., Herbel, C., Baranger, E., Savoye, C., et al. (2002). Role of anxiety and depression in the onset of spontaneous preterm labor. *American Journal of Epidemiology*, *155*(4), 293-301.
- Deave, T., Heron, J., Evans, J., & Emond, A. (2008). The impact of maternal depression in pregnancy on early child development. *BJOG*, *115*, 1043-1051.
- Dekeyser, M., Raes, F., Leijssen, M., Leysen, S., & Dewulf, D. (2008). Mindfulness skills and interpersonal behavior. *Personality and Individual Differences*, *44*(5), 1235-1245.
- Dennis, C. L., & Allen, K. (2008). Interventions (other than pharmacological, psychosocial, or psychological) for treating antenatal depression. *Cochrane Database of Systematic Reviews*(4).
- Dubnov-Raz, G., Juurlink, D. N., Fogelman, R., Merlob, P., Ito, S., Koren, G., et al. (2008). Antenatal use of selective serotonin-reuptake inhibitors and QT interval prolongation in newborns. *Pediatrics*, *122*, 710-715.
- Evans, S., Ferrando, S., Findler, M., Stowell, C., Smart, C., & Haglin, D. (2008). Mindfulness-based cognitive therapy for generalized anxiety disorder. *Journal of Anxiety Disorders*, *22*, 716-721.
- Field, T., Diego, M., Dieter, J., Hernandez-Reif, M., Schanberg, S., Kuhn, C., et al. (2004). Prenatal depression effects on the fetus and the newborn. *Infant Behavior and Development*, *27*, 216-229.
- Field, T., Diego, M., Hernandez-Reif, M., Figueiredo, B., Schanberg, S., Kuhn, C., et al. (2008). Chronic prenatal depression and neonatal outcome. *International Journal of Neuroscience*, *118*, 95-103.

- Field, T., Diego, M., Hernandez-Reif, M., Vera, Y., Gil, K., Schanberg, S., et al. (2004). Prenatal maternal biochemistry predicts neonatal biochemistry. *International Journal of Neuroscience, 114*, 933-945.
- Field, T., Sandberg, D., Garcia, R., Vega-Lahr, N., Goldstein, S., & Guy, L. (1985). Pregnancy problems, postpartum depression, and early mother-infant interactions. *Developmental Psychology, 21*(6), 1152-1156.
- Freeman, M. P., Hibbeln, J. R., Wisner, K. L., Watchman, M., & Gelenberg, A. J. (2006). An open trial of omega-3 fatty acids for depression in pregnancy. *Acta Neuropsychiatrica, 18*, 21-24.
- Galantino, M. L., Baime, M., Maguire, M., Szapary, O., & Farrar, J. T. (2005). Short Communication: Association of psychological and physiological measures of stress in health-care professionals during an 8-week mindfulness meditation program: mindfulness in practice. *Stress and Health, 21*, 255-261.
- Goldenberg, R. L., & Culhane, J. F. (2007). Low birth weight in the United States. *The American Journal of Clinical Nutrition, 85*(suppl), 584S-590S.
- Goldenberg, R. L., Culhane, J. F., Iams, J. D., & Romero, R. (2008). Epidemiology and causes of preterm birth. *The Lancet, 371*, 75-84.
- Goodman, J. H. (2009). Women's attitudes, preferences, and perceived barriers to treatment for perinatal depression. *Birth, 36*(1), 60-69.
- Grepmaier, L., Mitterlehner, F., Loew, T., Bachler, E., Rother, W., & Nickel, M. (2007). Promoting mindfulness in psychotherapists in training influences the treatment results of their patients: a randomized, double-blind, controlled study. *Psychotherapy and Psychosomatics, 76*, 332-338.

- Groopman, J. (2007). *How Doctors Think*. Boston, MA: Houghton Mifflin.
- Haller, D. L., Knisley, J. S., Dawson, K. S., & Schnoll, S. H. (1993). Perinatal substance abusers: psychological and social characteristics. *The Journal of Nervous and Mental Disease*, *181*(8), 509-513.
- Hamilton, B. E., Martin, J. A., & Venture, S. J. (2009). Births: preliminary data for 2007. *National Vital Statistics Reports (web release)*, *57*(12), 1-23.
- Hanna, B., Jarman, H., Savage, S., & Layton, K. (2004). The early detection of postpartum depression: midwives and nurses trial a checklist. *JOGNN*, *33*, 191-197.
- Hattori, Y., Nakanishi, T., Ozaki, Y., Nozawa, K., Sato, T., & Sugiura-Ogasawara, M. (2007). Uterine cervical inflammatory cytokines, interleukin-6 and 8 as predictors of miscarriage in recurrent cases. *American Journal of Reproductive Immunology*, *58*, 350-557.
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and Commitment Therapy: An Experiential Approach to Behavior Change*. New York, NY: The Guilford Press.
- Jangland, E., Gunningberg, L., & Carlsson, M. (2009). Patients' and relatives' complaints about encounters and communication in health care: evidence for quality improvement. *Patient Education and Counseling*, *75*, 199-204.
- Jesse, E. D., Dolbier, C. L., & Blanchard, A. (2008). Barriers to seeking help and treatment suggestions for prenatal depressive symptoms: focus groups with rural low-income women. *Issues in Mental Health Nursing*, *29*, 3-19.
- Jonsson, Y., Ruber, M., Matthiesen, L., Berg, G., Nieminen, K., Sharma, S., et al. (2006). Cytokine mapping of sera from women with preeclampsia and normal pregnancies. *Journal of Reproductive Immunology*, *70*, 83-91.

- Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation. *General Hospital Psychiatry*, 4(1), 33-47.
- Kabat-Zinn, J. (1993). Mindfulness meditation: health benefits of an ancient Buddhist practice. In Goleman & Gurin (Eds.), *Mind/Body Medicine*. New York, NY: Consumer Report Books.
- Kachalia, A., Gandhi, T. K., Puopolo, A. L., Yoon, C., Thomas, E. J., Griffey, R., et al. (2007). Missed and delayed diagnosis in the emergency department: a study of closed malpractice claims from 4 liability insurers. *Annals of Emergency Medicine*, 49(2), 196-205.
- Kieviet-Stijnen, A., Visser, A., Garssen, B., & Hudig, W. (2008). Mindfulness-based stress reduction training for oncology patients: patients' appraisal and changes in well-being. *Patient Education and Counseling*, 72, 436-442.
- Kuyken, W. (2008). Mindfulness-based cognitive therapy to prevent relapse in recurrent depression. *Journal of Consulting and Clinical Psychology*, 76(6), 966-978.
- Laine, K., Heikkinen, T., Ekblad, U., & Kero, P. (2003). Effects of exposure to selective serotonin reuptake inhibitors during pregnancy on serotonergic symptoms in newborns and cord blood monoamine and prolactin concentrations. *Archives of General Psychiatry*, 60, 720-726.
- Langer, E. J. (1989). *Mindfulness*. Cambridge, MA: Perseus Books.
- Lee, A. M., Lam, S. K., Lau, S. M. S. M., Chong, C. S. Y., Chui, H. W., & Fong, D. Y. T. (2007). Prevalence, course, and risk factors for antenatal anxiety and depression. *Obstetrics and Gynecology*, 110, 1102-1112.

- Levinson-Castiel, R., Merlob, P., Linder, N., Sirota, L., & Klinger, G. (2006). Neonatal abstinence syndrome after in utero exposure to selective serotonin reuptake inhibitors in term infants. *Archives of Pediatric and Adolescent Medicine*, *160*, 173-176.
- Li, D., Liu, L., & Odouli, R. (2009). Presence of depression symptoms during early pregnancy and the risk of preterm delivery: a prospective cohort study. *Human Reproduction*, *24*(1), 146-153.
- Lieferman. (2005). Mothers' mental distress and parenting practices with infants and toddlers. *Archives of Women's Mental Health*.
- Lindgren, K. (2001). Relationships among maternal-fetal attachment, prenatal depression, and health practices in pregnancy. *Research in Nursing and Health*, *24*, 203-217.
- Linehan, M. M. (1993). *Cognitive-behavioral Treatment of Borderline Personality Disorder*. New York, NY: The Guilford Press.
- Ludwig, D. S., & Kabat-Zinn, J. (2008). Mindfulness in medicine. *JAMA*, *300*(11), 1350-1352.
- Lundy, B. L., Jones, N. A., Field, T., Nearing, G., Davalos, M., Pietro, P. A., et al. (1999). Prenatal depression effects on neonates. *Infant Behavior and Development*, *22*(1), 119-129.
- Manusco, R. A., Schetter, C. D., Rini, C. M., Roesch, S. C., & Hobel, C. J. (2004). Maternal prenatal anxiety and corticotropin-releasing hormone associated with timing of delivery. *Psychosomatic Medicine*, *66*, 762-769.
- Marcus, S. M. (2009). Depression during pregnancy: rates, risks, and consequences. *Canadian Journal of Clinical Pharmacology*, *16*(1), e15-e22.
- McCormick, M. C. (1985). The contribution of low birth weight to infant mortality and childhood morbidity. *New England Journal of Medicine*, *312*, 82-90.

- McLearn, K. T., Minkovitz, C. S., Strobino, D. M., Marks, E., & Hou, W. (2006). Maternal depressive symptoms at 2 to 4 months post partum and early parenting practices. *Archives of Pediatric and Adolescent Medicine, 160*, 279-284.
- McLearn, K. T., Minkovitz, C. S., Strobino, D. M., Marks, E., & Hou, W. (2006). The timing of maternal depressive symptoms and mothers' parenting practices with young children: implications for pediatric practice. *Pediatrics, 118*, e174-e182.
- Mennes, M., Stiers, P., Lagae, L., & Van den Bergh, B. (2006). Long-term cognitive sequelae of antenatal maternal anxiety: involvement of the orbitofrontal cortex. *Neuroscience and Biobehavioral Reviews, 30*, 1078-1086.
- Milgrom, J., Gemmill, A. W., Bilszta, J. L., Hayes, B., Barnett, B., Brooks, J., et al. (2008). Antenatal risk factors for postnatal depression: a large prospective study. *Journal of Affective Disorders, 108*, 147-157.
- Mirsi, S., Oberlander, T. F., Fairbrother, N., Carter, D., Ryan, D., Kuan, A. J., et al. (2004). Relation between prenatal maternal mood and anxiety and neonatal health. *Canadian Journal of Psychiatry, 49*(10), 684-689.
- Moss, A. J., Schwartz, P. J., Crampton, R. S., Tzivoni, D., Locati, E. H., MacCluer, J., et al. (1991). The long QT syndrome: prospective longitudinal study of 328 families. *Circulation, 84*, 1136-1144.
- Murphy, D. L., Liebling, R. E., Verity, L., Swingler, R., & Patel, R. (2001). Early maternal and neonatal morbidity associated with operative delivery in second stage of labour: a cohort study. *Lancet, 358*, 1203-1207.

- O'Connor, T. G., Heron, J., Glover, V., & Team, A. S. (2002). Antenatal anxiety predicts child behavioral/emotional problems independently of postnatal depression. *Journal of American Academy of Child and Adolescent Psychiatry, 41*, 1470-1477.
- O'Mahen, H. A., & Flynn, H. A. (2008). Preferences and perceived barriers to treatment for depression during the perinatal period. *Journal of Women's Health, 17*(8), 1301-1309.
- Orr, S. T., Blazer, D. G., James, S. A., & Reiter, J. P. (2007). Depressive symptoms and indicators of maternal health status during pregnancy. *Journal of Women's Health, 16*(4), 535-542.
- Pajulo, M., Savonlahti, E., Sourander, A., Helenius, H., & Piha, J. (2001). Antenatal depression, substance dependency and social support. *Journal of Affective Disorders, 65*, 9-17.
- Pawlby, S., Hay, D. F., Sharp, D., Waters, C. S., & O'Keane, V. (2009). Antenatal depression predicts depression in adolescent offspring: prospective longitudinal community-based study. *Journal of Affective Disorders, 113*, 236-243.
- Ramenteria, J. L., & Bhatt, K. (1977). Withdrawal symptoms in neonates from intrauterine exposure to diazepam. *Journal of Pediatrics, 90*, 123-126.
- Rapgay, L., & Bystrisky, A. (2009). Classical Mindfulness: an introduction to its theory and practice for clinical application. *Annals of the New York Academy Sciences, 1172*, 148-162.
- Ratanawongsa, N., Roter, D., Beach, M. C., Laird, S. L., Larson, S. M., Carson, K. A., et al. (2008). Physician burnout and patient-physician communication during primary care encounters. *Journal of General Internal Medicine, 23*(10), 1581-1588.
- Rhodes, K. V., & Iwashyna, T. J. (2007). Child injury risks are close to home: parent psychosocial factors associated with child safety. *Maternal and Child Health Journal, 11*, 269-275.

- Richards, D. S. (2007). Is electroconvulsive therapy in pregnancy safe? *Obstetrics and Gynecology*, *110*(2), 451-452.
- Rogers, E. M. (2003). *Diffusion of Innovations, 5th Edition*. New York, NY: Free Press.
- Rondo, P. H. C., Ferreira, R. F., Ribeiro, M. C. N., Lobert, H., & Artes, R. (2003). Maternal psychological stress and distress as predictors of low birth weight, prematurity, and intrauterine growth retardation. *European Journal of Clinical Nutrition*, *57*, 266-272.
- Saunders, T. A., Loberl, M., Veloso, C., & Meyer, B. A. (2006). Prenatal maternal stress is associated with delivery analgesia and unplanned cesareans. *Journal of Psychosomatic Obstetrics and Gynecology*, *27*(3), 141-146.
- Scott, J. G., Cohen, D., DiCicco-Bloom, B., Miller, W. L., Stange, K. C., & Crabtree, B. F. (2008). Understanding healing relationships in primary care. *Annals of Family Medicine*, *5*(4), 315-322.
- Shapiro, S. L., Astin, J. A., Bishop, S. R., & Cordova, M. (2005). Mindfulness-based stress reduction for health care professionals: results from a randomized trial. *International Journal of Stress Management*, *12*(2), 164-176.
- Shapiro, S. L., Schwartz, G. E., & Bonner, G. (1998). Effects of mindfulness-based stress reduction on medical and premedical students. *Journal of Behavioral Medicine*, *21*(6), 581-599.
- Smith, S. E. P., Li, J., Garbett, K., Mirnics, K., & Patterson, P. H. (2007). Maternal immune activation alters fetal brain development through interleukin-6. *The Journal of Neuroscience*, *27*(40), 10695-10702.
- Spickard, A., Gabbe, S. G., & Christensen, J. F. (2002). Mid-career burnout in generalist and specialist physicians. *Journal of the American Medical Association*, *288*, 1447-1450.

- Su, K., Huang, S., Chiu, T., Huang, K., Huang, C., Chang, H., et al. (2008). Omega-3 fatty acids for major depressive disorder during pregnancy: results from a randomized, double-blind, placebo-controlled trial. *Journal of Clinical Psychiatry, 69*, 644-651.
- Sullivan, M. J., Wood, L., Terry, J., Brantley, J., Charles, A., McGee, V., et al. (2009). The Support, Education, and Research in Chronic Heart Failure Study (SEARCH): A mindfulness-based psychoeducational intervention improves depression and clinical symptoms in patients with chronic heart failure. *American Heart Journal, 157*, 84-90.
- Teasedale, J. D., Segal, Z. V., Williams, J. M., Ridgeway, V. A., Soulsby, J. M., & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Counseling and Clinical Psychology, 68*(4), 615-623.
- Toh, S., Mitchell, A. A., Louik, C., Werler, M. M., Chambers, C. D., & Hernandez-Diaz, S. (2009). Selective serotonin reuptake inhibitor use and risk of gestational hypertension. *American Journal of Psychiatry, 166*, 320-328.
- Turner, K. M., Sharp, D., Folkes, L., & Chew-Graham, C. (2008). Women's views and experiences of antidepressants as a treatment for postnatal depression: a qualitative study. *Family Practice, 450-455*.
- Vahey, D. C., Aiken, L. H., Sloane, D. M., Clarke, S. P., & Vargas, D. (2004). Nurse burnout and patient satisfaction. *Medical Care, 42*(2 suppl), II-57-II-66.
- van der Wal, M. F., van Eijsden, M., & Bonnel, G. J. (2007). Stress and emotional problems during pregnancy and excessive infant crying. *Journal of Developmental and Behavioral Pediatrics, 28*(6), 431-437.

- Vieten, C., & Astin, J. (2008). Effects of a mindfulness-based intervention during pregnancy on prenatal stress and mood: results of a pilot study. *Archives of Women's Mental Health, 11*, 67-74.
- Walach, H., Buchheld, N., Butenmuller, V., Kleinknecht, N., & Schmidt, N. (2006). Measuring mindfulness--the Freiburg Mindfulness Inventory (FMI). *Personality and Individual Differences, 40*, 1543-1555.
- Walsh-Sukys, M. C., Tyson, J. E., & Wright, L. L. (2000). Persistent pulmonary hypertension of the newborn in the era before nitric oxide: practice variation and outcomes. *Pediatrics, 105*, 14-20.
- Wikner, B. N., Stiller, C. O., Bergman, U., Asker, C., & Kallen, B. (2007). Use of benzodiazepines and benzodiazepine receptor agonists during pregnancy: neonatal outcome and congenital malformations. *Pharmacoepidemiology and Drug Safety, 16*, 1203-1210.
- Williams, J., & Mitchell, M. (2007). Midwifery managers' views about the use of complementary therapies in the maternity services. *Complementary Therapies in Clinical Practice, 13*, 129-135.
- Wisner, K. L., Gelenberg, A. J., Leonard, H., Zarin, D., & Frank, E. (1999). Pharmacologic treatment of depression during pregnancy. *JAMA, 182*, 1264-1296.
- Wisner, K. L., Sit, D. K. Y., Hanusa, B. H., Moses-Kolko, E. L., Bogen, D. L., Hunker, D. F., et al. (2009). Major depression and antidepressant treatment: impact on pregnancy and neonatal outcomes. *American Journal of Psychiatry, 166*, 557-566.
- Witek-Janusek, L., Albuquerque, K., Chroniak, K. R., Chroniak, C., Durazo-Arvizu, R., & Mathews, H. L. (2008). Effect of mindfulness based stress reduction on immune function,

quality of life and coping in women newly diagnosed with early stage breast cancer. *Brain, Behavior, and Immunity*, 22, 969-981.

Yonkers, K. A., Wisner, K. L., Stewart, D. E., Oberlander, T. F., Dell, D. L., Stotland, N., et al. (2009). The management of depression during pregnancy: a report from the American Psychiatric Association and the American College of Obstetricians and Gynecologists. *Obstetrics and Gynecology*, 114(3), 703-713.

Zeskind, P. S., & Stephens, L. E. (2004). Maternal selective serotonin reuptake inhibitor use during pregnancy and newborn neurobehavior. *Pediatrics*, 113, 368-375.