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Preparing To Parent: Mindfulness In Expectant Parents Exposed To Adversity

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PREPARING TO PARENT: MINDFULNESS IN EXPECTANT PARENTS EXPOSED TO ADVERSITY

by

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DISSERTATION

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DEDICATION

"The future belongs to those who believe in the power of their dreams"

~ Eleanor Roosevelt

I dedicate this dissertation to all of the women and babies who have touched my life and provided inspiration for this work.

To my partner, my constant support, my love,

Steven Dettloff

To my parents, who told me I would excel at whatever I wanted to be life, whether it was a fighter pilot, actress or entrepreneur.

Gale O'Malley & Robert Hicks

To all of the nurturers in my life, there are too many to count. Thank you.

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CHAPTER 1 INTRODUCTION

Background

Pregnancy, for both mothers and fathers, can be a very transformative time in life. Parents-to-be may think about what it will be like to be a parent, what their baby will look like, act like, and what it will feel like to hold their baby for the first time. For many, pregnancy also brings anxiety, worry and stress, especially if a parent lives in poverty, is exposed to violence, trauma or racial oppression (Åsenhed, Kilstam, Alehagen, & Baggens, 2014; Deave, Johnson, & Ingram, 2008). Unfortunately, this is the reality for many expectant parents during pregnancy. For these parents, stress may reach toxic levels (Frodl & O'Keane, 2013; Lupien, Ouellet-Morin, Herba, Juster, & McEwen, 2016; Shonkoff et al., 2012).

Toxic stress is broadly defined as the stress that is incurred from frequent, intense, or lengthy activation of the body's physical stress response system (Shonkoff et al., 2012). For parents living in poverty, stressors such as the experience of coping with psychopathology (e.g., depression, trauma) and exposure to violence may accumulate, culminating in toxic stress. The long-term consequences of exposure to toxic stress, especially during times of developmental vulnerability, constitutes a significant health concern. In pregnancy, for example, toxic levels of stress experienced by the mother are linked to poorer birth outcomes for the infant (Loomans et al., 2013). Furthermore, toxic levels of maternal stress can trigger a physiological signal to the fetus' developing brain, defined as *fetal programming*, which is believed to be linked to health (Entringer, Buss, & Wadhwa, 2012), behavior (Buss, Entringer, & Wadhwa, 2012) and developmental concerns (E. P. Davis & Sandman, 2010; DiPietro, Matthew, Costigan, Atella, & Reusing, 2006) for the infant throughout the lifespan.

Although much is known about maternal exposure to stress in the perinatal period, very little is known about fathers' exposure and the effects on paternal physiology as well as future risk for child maltreatment. Some research has identified physiological, neuroendocrine changes in fathers that may also be responsive to stress exposure. Specifically, a lower testosterone level was associated with more sympathy and need to respond to a baby's cry (Fleming, Corter, Stallings, & Steiner, 2002). Father's baseline hormone levels prior to hearing the baby cry were associated with how they responded, adding to the evidence that some men may be biologically prepared to be more nurturing than others. A study by Weisman et al. (2013), found that paternal testosterone levels were negatively correlated with affectionate touch with their infant which begins to support the hypothesis that father's physiology changes during parenthood and affects the way they parent their children. Finding protective factors that may decrease fathers' stress in pregnancy may then change their physiology in such a way that they become more sensitive and attuned parents, potentially reducing the risk of child maltreatment.

This dissertation will investigate the relationship between potential risk and resiliency factors that may contribute to both mothers' and fathers' wellbeing. Participants in this study are considered high-risk for the development of harsh and insensitive parenting outcomes due to exposure to poverty and community and interpersonal violence (Barajas-Gonzalez & Brooks-Gunn, 2014). In addition, approximately 64% of the sample are African American and, given the known health disparities for African Americans (Braveman, 2011; Braveman et al., 2015; Grobman et al., 2016; S. Zhang et al., 2013), the sample is additionally at risk for poor health outcomes. The first chapter of this dissertation will summarize particular risks and challenges faced by parent's expecting a baby. I will then discuss the effects of stress during pregnancy, not only on the parent, but also on the developing infant and how the neurobiological effects of toxic

levels of stress may predispose parents and infants to experience difficulty coping with stress. The importance of coping with stress will be discussed through the lens of Lazarus and Foulk's stress and coping theory (Lazarus & Folkman, 1984). Finally, a key potential resiliency factor, mindfulness, will be explored as both a trait and a method to buffer the effects of toxic stress on affected parents.

Effects of stress in pregnancy

Stress is defined as an emotional experience that includes biochemical, physiological and behavioral changes (Baum, 1990). Stressful events experienced by vulnerable families of young children may include relationship difficulty, financial insecurity, community violence exposure, racial discrimination, mental and physical health concerns, and exposure to traumatic events (both historical and current). Stress in pregnancy may also be specific to being pregnant, including concern about the baby's development, physical discomfort, poor sleep, and worry about the birth process. Any of these stressors may affect the expectant parents' mental health (Seah & Morawska, 2015; Zanella, 2015), the infant's development (Appleton et al., 2016; Glover, Ahmed-Salim, & Capron, 2016; Golub et al., 2016) and postnatal parenting (Pereira et al., 2012; Stith et al., 2009). Although the mechanism accounting for the association of prenatal stress and infant development outcomes is not completely known, there is strong evidence to suggest that the physiological stress response experienced by the pregnant woman affects the environment of the womb and later child behavior and development (Appleton et al., 2016; E. P. Davis, Glynn, Waffarn, & Sandman, 2011; E. P. Davis & Sandman, 2010; Glover, 2015). Understanding the influence of stressful life events – and the resilience factors that may buffer parents in the face of these stressors – is imperative to improve wellness and health in parents and children.

Neurobiology of Stress

Parents who are exposed to stressors such as poverty and violence may experience physiological changes that influence their socioemotional functioning, including their ability to prepare to parent a new baby. The autonomic nervous system (ANS) contains two subsystems: the sympathetic and parasympathetic branches. The sympathetic nervous system is responsible for activating the "fight, flight or freeze" reaction, preparing the body to flee from a dangerous situation, whereas the parasympathetic system controls restorative and growth functions (Porges, 1995). When an individual detects a threat in the environment, the body's autonomic nervous system reacts and shifts to a fight, flight or freeze response which initiates a neuroendocrine, vascular and immune response as the sympathetic nervous system engages so the individual can respond to the stressor (Wadhwa, Culhane, Rauh, & Barve, 2001).

Vagal tone, another measure of the autonomic nervous system, is also affected when an individual is under stress. Porges (1995) proposes that when an individual is exposed to environmental stressors, their ANS reacts by slowing their cardiac vagal tone which promotes increased heart rate to support physiological mobilization to defend against the threat. Once the threat is removed, the vagal tone returns to physiological homeostasis (Porges, 1995). Chronic stress may increase the overall allostatic load of an individual (Juster, McEwen, & Lupien, 2010), resulting in a lower baseline vagal tone that may impair cognitive and emotional functioning as well as increase the likelihood of physical ailments such as insulin resistance and cardiovascular disease (Curtis & O'Keefe, 2002).

The hypothalamic-pituitary-adrenal axis (HPA axis) is another important part of the human endocrine and stress system that is affected by chronic stress. This part of the stress system is intended to promote survival in times of acute threat. When chronically activated, however, stress hormones such as cortisol increase and may become neurotoxic, reducing healthy social-emotional

functioning (Charmandari, Tsigos, & Chrousos, 2005; de Rezende et al., 2016). The hippocampus, one part of the brain responsible for memory and learning, also may be affected by early childhood exposure to trauma and stress. Research has shown that adult hippocampal size is reduced when individuals experience depression (Videbech & Ravnkilde, 2004), and in individuals exposed to early childhood maltreatment (Frodl & O'Keane, 2013).

An increasing number of studies have demonstrated that neurobiological changes that may occur in the embryonic environment introduce a vulnerability to the developing child. Fetal programming is theorized as the transmission of disease from mother to child, in the womb (E. P. Davis & Sandman, 2010; Entringer et al., 2012; Hoffman, 2016). It is believed that stress experienced in-utero may lead to lasting structural, metabolic and epigenetic changes (Lau, Rogers, Desai, & Ross, 2011). This was studied in a sample of 116 mothers and their full-term infants. Researchers collected cortisol samples throughout pregnancy and then collected cortisol from their infant through a heel-prick procedure 24-hours after birth. Higher prenatal maternal cortisol levels were associated with higher infant cortisol levels, and a slower rate of recovery from the stress of having the heel pricked (E. P. Davis et al., 2011). Evidence suggests that when a woman experiences stress during pregnancy, some of the neuroendocrine changes such as higher cortisol, affect the in-utero environment of the fetus, and thereby affect fetal growth and development. For example, some research reports that infants of women who exhibited lower levels of cortisol early in pregnancy have increased cognitive development at twelve months of age (E. P. Davis & Sandman, 2010). In addition, Field, Hernandez-Reif, et al. (2006) found an association between prenatal depression in mothers, higher levels of cortisol, prematurity, low birth weight and delayed early development.

Findings suggest a potential intergenerational effect of stress at a neurobiological level that may contribute to the way people react to stressful situations. This can begin to explain why some people are more susceptible to psychopathology, specifically when exposed to experiences that remind them of their own trauma. Understanding the potential risk and resiliency factors during pregnancy that lead to improved coping with stress, may not only affect the wellbeing of the parent, but may change the environment of the womb, allowing the infant a chance at healthier development.

Stress and Coping

Not everyone who is exposed to stress, traumatic events or psychological challenges responds in the same way (Bonanno, 2004). There is immense variability in how one may perceive a stressor which may then change the way that individuals respond or react to a given situation. The Stress and Coping Theory (Folkman, 1997; Lazarus & Folkman, 1984) hypothesizes that when a potential stressor is present and is not met with adaptive coping, there is the potential for an individual to experience significant distress that may affect their health and wellbeing. When applying this framework to the parent-child relationship, it may not only be the parent who experiences reduced wellbeing, but also the child. Lazarus and Folkman (1984) state that some individuals may perceive a stressful event as a challenge whereas others may see it as a threat. The appraisal of the threat, such as parenting stress, initiates a pattern of coping and then produces physiological responses to the situation. When an individual perceives a situation as dangerous or threatening, whether there is objective threat or not, their body responds in the same way as it would to an objectively dangerous threat, activating the nervous system to respond (e.g., fight or flight response). When this response is chronic, an exaggerated physiologic reactivity manifests which is linked to poor health (Frodl & O'Keane, 2013) and difficulty regulating emotion

(Holzman & Bridgett, 2017). Conversely, if a stressful event is perceived as a challenge, an individual may experience more adaptive coping and greater positive affect. Folkman (1997) theorizes that the increased positive affect allows for a pause from the stress which then allows an individual to evaluate the situation more clearly and to act with more intention. Therefore, parents who have experienced past trauma, or are struggling with significant psychiatric symptoms, may have a chronically activated nervous system that leads them to have a more difficult time coping with life stressors. Additionally, the transition to parenting is often a very demanding and stressful time even without the added difficulty that a trauma history or depression may impart. Parents who have a more adaptive coping response, may be able to respond more sensitively to their children, even when a child is engaging in very challenging behaviors.

Mindfulness

There is no doubt that many people are incredibly resilient to extreme challenges in life. Why is this? It may be that resiliency factors exist for these individuals that buffer the effects of stress and improve their wellbeing. This is especially important to understand when working with individuals who are exposed to violence and trauma. Parents of young children are a particularly important group because their own health and wellbeing, and that of their children, can be affected by the impact of trauma exposure. Mindfulness is one potential protective factor that is linked to improved wellbeing (Townshend, Jordan, Stephenson, & Tsey, 2016), reduced depressive symptoms (Dimidjian et al., 2014; Segal, Teasdale, & Williams, 2002; Teasdale et al., 2000), reduced trauma symptoms (Banks, Newman, & Saleem, 2015), improved emotion regulation (Feldman, Lavallee, Gildawie, & Greeson, 2016; Jager, 2016; McDonald et al., 2016; Tang, Tang, & Posner, 2016) and improved parenting (Bluth, Roberson, Billen, & Sams, 2013; Bögels,

Hellemans, Deursen, Römer, & Meulen, 2014; Campbell, Thoburn, & Leonard, 2017; Coatsworth et al., 2014; Corthorn & Milicic, 2015).

Mindfulness levels, both pre- and post-intervention, are known to affect the areas of the brain that are responsible for the initiation of physiological stress response, specifically, the grey matter of the amygdala, and the connectivity between the amygdala and other areas that are responsible for stress reactivity (Creswell & Lindsay, 2014; Tang, Hölzel, & Posner, 2015). Furthermore, early research has found that trait mindfulness buffers the HPA axis' reaction to acute stress, leading to a decrease in cortisol and thereby characterizing a change in stress response (Creswell & Lindsay, 2014). Mindfulness interventions have also been shown to improve parasympathetic response to stressors, which essentially counteracts the fight or flight response (May et al., 2016; Tang et al., 2015).

Mindfulness theories are based in Buddhist philosophy. The first noble truth in Buddhism is that all beings will suffer and the method to alleviate that suffering is to accept it and invite it in. It is believed that the avoidance and pushing away of pain or discomfort is what causes great suffering in humans. Therefore, it is taught through meditation, to be present with discomfort without judgment as a method to relieve suffering (XIV Bstan-'dzin-rgya, 1997). It is also believed that all people have some trait level of mindfulness and this can be increased with specific mindfulness practices (Baer, 2003; Eisenlohr-Moul, Walsh, Charnigo, Lynam, & Baer, 2012).

Mindfulness-based interventions include a combination of psycho-education, yoga, and meditation. Yoga and meditation, when taught through the lens of mindfulness, work to cultivate compassion, acceptance and non-judgment in the participant. The original and most researched, manualized mindfulness intervention is Mindfulness-Based Stress Reduction (MBSR), which was developed in 1979 by Jon Kabat-Zinn at the University of Massachusetts Medical Center (Kabat-

Zinn, 2003). MBSR was designed as a method to employ intensive meditation skills for medical patients to cope with pain, illness, and stress (Kabat-Zinn, 2003). This 8-week, secular program has been researched with significant positive outcomes in adults with chronic pain (Chiesa & Serretti, 2011; Kabat-Zinn, 1982), anxiety (Arch et al., 2013; Hofmann, Sawyer, Witt, & Oh, 2010), depression (Hofmann et al., 2010; Shapiro, Schwartz, & Bonner, 1998), well-being of cancer patients (Carlson, Speca, Patel, & Goodey, 2004; Grossman, Niemann, Schmidt, & Walach, 2004), and PTSD (Earley et al., 2014; Goldsmith et al., 2014; Goulao & MacLennan, 2016).

A variety of adaptations of MBSR have been developed for specific populations, including those with depression (Mindfulness-Based Cognitive Therapy), pregnant mothers with (Mindfulness-Based Childbirth and Parenting Education) and without their partners (Mindfulness-Based Cognitive Therapy for Postpartum Depression), children and adolescents struggling with stress and psychopathology (Mindfulness-Based Stress Reduction for Teens; Learning to Breathe; dotB) and substance abusing adults (Mindfulness-Oriented Relapse Education; Mindfulness-Based Relapse Prevention). Most Mindfulness-Based Interventions (MBI) consist of eight-weekly, 2-2.5 hour sessions with homework assigned between sessions. Within the weekly group, participants learn formal practices such as awareness of breathing meditation, body scan techniques, and mindful movement / yoga. Informal practices are also taught to bring mindful attention to every day experiences. These include mindfully eating, walking, listening and talking, in addition to applying mindfulness approaches to daily stressful occurrences. Finally, mindful inquiry is employed by the teacher to evoke a sense of curiosity of the experience in an open and accepting way (Kabat-Zinn, 1982). There are also seven foundational attitudes cultivated by the teacher: non-judging, patience, beginner's mind, trust, non-striving, acceptance and letting go (Kabat-Zinn, 2003).

The area of mindfulness research has recently expanded to include effects of mindfulness on parents. It is believed that parents with higher levels of mindfulness may be better able to respond to their children, specifically in stressful moments, with greater emotion regulation and sensitivity (Coatsworth, Duncan, Nix, & Greenberg, 2015; Kirby, 2016; Siu, Ma, & Chui, 2016; Townshend et al., 2016). Although research is growing to increase our knowledge of how trait mindfulness may be an important protective factor for expectant parents, we still do not know basic information about mindfulness in the context of diverse populations. Furthermore, very little is known regarding the effects of mindfulness on expectant fathers.

Purpose

The aim of this dissertation study is to investigate risk and resiliency factors that expectant parents living in a diverse, urban environment may experience. Findings are presented using a three-paper format. This allows for numerous types of interrelated data to be presented in one manuscript as three separately publishable articles. Dissertation chapters two, three, and four serve as three individual and distinct, journal-ready research articles for three related studies on the risk and resiliency factors for mental health, harsh parenting, and stress in a group of diverse, urban, expectant parents. Each chapter has its own background, methodologies, findings, and discussion, and thus some literature and methodological descriptions may be reiterated throughout the chapters, where necessary. Chapter five will provide implications for future study and overall conclusions from this research.

Chapter two will focus on the relationship between trauma symptoms, dispositional mindfulness and depressive symptoms in expectant mothers and fathers from Detroit, Michigan. Depression during pregnancy is linked with deleterious outcomes in pre- and post-natal maternal and infant health, infant behavior, infant development, parent-infant relationship quality and

parenting characteristics (Baker, Orton, Kendrick, & Tata, 2015; Beeghly et al., 2017; Dubber, 2015; Field, 1998; Gentile, 2015; Glover et al., 2016). Depression is often comorbid with trauma symptomology (Muzik et al., 2016; Oh et al., 2016). Research posits that the ability to be mindful in everyday life may protect individuals from depression, however no research to date examines this relationship in a diverse sample of urban mothers and fathers. Using the self-report questionnaires: Edinburgh Postpartum Depression Scale, Trauma Symptoms Checklist and the Five Facets of Mindfulness, this study will examine the following research questions: (1) What is the overall level of mindfulness, depressive and trauma symptoms in this sample and are levels different for mothers and fathers? (2) Is there a connection between dispositional mindfulness and trauma or depressive symptoms? Furthermore, are there specific subscales of mindfulness that are more strongly associated with depression and trauma. (3) Do higher levels of mindfulness predict lower depressive symptoms, even when controlling for trauma symptoms? It is hypothesized that: (1) There will be no difference in mindfulness levels by parent gender and expectant women will exhibit higher levels of depression than men. (2) Mindfulness levels will be negatively correlated with depressive and trauma symptoms, and depressive and trauma symptoms will be positively correlated with each other. (3) Higher levels of mindfulness will be associated with lower depressive symptoms, even when controlling for trauma symptoms.

Chapter three will investigate the associations and influence of trauma history, trauma symptoms, depressive symptoms and dispositional mindfulness on the potential risk for future child abuse in the same sample of high-risk expectant parents. Depression and trauma symptoms are known to be associated with the potential for child abuse (Appleyard, Berlin, Rosanbalm, & Dodge, 2011; Berlin, Appleyard, & Dodge, 2011). However, much of this research has considered mothers and not fathers during pregnancy. Several protective or resiliency factors within the

maternal literature have been identified that may improve parent wellbeing and reduce a parent's potential for child abuse (Child Welfare Information Gateway, 2013), however no study to date has investigated mindfulness as a possible resiliency factor. This study will examine the research questions: (1) What are the associations between mindfulness, trauma, depressive symptoms and the potential for child abuse? (2) Are higher levels of mindfulness associated with a lower risk for potential of child abuse even when controlling for trauma exposure, trauma symptoms and depressive symptoms? Measures will include the Childhood Trauma Questionnaire, Trauma Symptoms Checklist, Five Facets of Mindfulness Scale, Edinburgh Postpartum Depression Scale and the Brief Potential of Child Abuse Inventory. It is hypothesized that: (1) Individuals who report higher levels of mindfulness will exhibit lower potential for child abuse. (2) Parents with higher trauma symptoms and depression will have higher potential for child abuse scores. (3) Higher levels of mindfulness will predict lower risk of child abuse even when controlling for trauma history, trauma symptoms and depressive symptoms.

Chapter four will investigate expectant parents' physiological responses to a common parenting stress, a baby cry. The study aims to understand the relationship between parents with high compared to low resiliency (a combination of social support, spirituality and mindfulness) and their physiological stress response (Heart Rate Variability). Research has found some promising connections between resiliency and heart rate variability (Lü, Wang, & You, 2016). For some individuals, there is a longer period between exposure to a stressor and the autonomic nervous system's recovery once the stressor is removed. It is suggested that toxic or chronic stress may affect this recovery leading to poorer regulation of emotion (Frodl & O'Keane, 2013). The resiliency factors that may affect heart rate variability and the ability for recovery after a stressor in expectant parents has not yet been examined. This study aims to answer the following research

questions: (1) Do parents demonstrate a stress reaction in response to attempting to soothe a crying baby doll, (2) When considering key factors that may help parents be resilient in the face of stress such as social support, spirituality and mindfulness, do expectant parents with high levels of resiliency exhibit less reactivity during a stressor than parents with low levels of resiliency? Further, do different resiliency factors predict different patterns of stress reactivity? (3) Is there a difference between high and low resiliency groups and their physiology over time during the stressful event of trying to soothe a crying baby doll? Is there a difference when examining the resiliency factors separately versus together? Measures will include the Five Facets of Mindfulness Scale, Multidimensional Perceived Social Support Scale, Brief Multidimensional Measure of Spirituality and Religiosity and a measure of heart rate variability (root mean square of the successive differences; RMSSD. Hypotheses include: (1) A physiological stress reaction will be identified in response to attempting to soothe a baby doll. There will be a reduction in RMSSD from baseline to baby cry and then an increase in RMSSD as the individual recovers. (2) Parents in the higher resiliency group (total sum score and individual measures) will exhibit a higher RMSSD at baseline. (3) There will be a difference between high and low resiliency groups, with parents in the high resiliency group recovering from the stressor sooner than parents in the low resiliency group.

CHAPTER 2 DEPRESSIVE SYMPTOMS IN EXPECTANT MOTHERS AND FATHERS: IS MINDFULNESS A BUFFER?

Introduction

Depression in pregnancy is a serious concern for expectant parents as well as the developing infant (Gentile, 2015; Glover et al., 2016). Antenatal depression is linked to poorer birth outcomes (Alhusen, Gross, Hayat, Woods, & Sharps, 2012), postpartum mental health (Robertson, Grace, Wallington, & Stewart, 2004), maternal morbidity (Marcus, 2009), and difficulty parenting during the postpartum period (Paulson, Dauber, & Leiferman, 2006; Perren, von Wyl, Burgin, Simoni, & von Klitzing, 2005). Depression and trauma symptoms are commonly comorbid (Seng, Low, Sperlich, Ronis, & Liberzon, 2009) with rates of trauma exposure and associated symptoms of depression more prevalent in populations considered high risk due to exposure to community violence and poverty (Kastello et al., 2015; Wenz-Gross, Weinreb, & Upshur, 2016). Despite potential efficacy, up to 50% of women decline pharmacological treatment for mental health concerns during the perinatal period due to fear of damage to the fetus in utero or by passing the drug to the infant during breastfeeding (L. S. Cohen et al., 2006). To prevent the deleterious effects of untreated mental illness, early detection and effective, acceptable, accessible, proactive treatment for antenatal depression, and trauma in pregnancy is crucial.

Mindfulness-based interventions (MBI) have shown promise as an effective method to reduce depressive symptoms (Segal, Williams, & Teasdale, 2002), depressive relapse (Teasdale et al., 2000) and post-traumatic stress symptoms (Banks et al., 2015), however much of the depression research thus far has been conducted using low-risk samples of predominately Caucasian, middle class participants. Before mindfulness interventions are disseminated to higher-risk communities, it is important to understand mindfulness levels in high-risk populations and relationships between mindfulness and psychiatric symptomology in these groups. Additionally,

if rates of trauma and depressive symptoms are comorbid in high-risk communities, as they are in low-risk communities, specific interventions that are trauma-informed may be indicated. Little is known about mindfulness during pregnancy, especially regarding fathers, and even less is known about fathers from higher-risk communities. This study aims to investigate the rates of depression and trauma symptoms in both mothers and fathers during pregnancy, and the relationship of these variables with dispositional mindfulness in a sample of expectant parents considered high risk due to their exposure to poverty and violence. Findings will inform the development of individualized interventions for vulnerable populations of expectant parents.

Trauma and Depression in Pregnancy

Perinatal depression, which is frequently comorbid with trauma, places mothers, infants and the mother-infant relationship at psychosocial and medical risk (Marcus, 2009). Studies show that 15-20% of women (Marcus, 2009) and 8-16% of men (Paulson & Bazemore, 2010) experience depression during pregnancy with even higher rates in low socio-economic-status (SES) populations (Lancaster et al., 2010). Symptoms of depression in pregnant women are a significant risk factor for poor maternal and child outcomes including preterm delivery, low birth weight, increased long-term risk for mental health problems in the mother and the infant (Field et al., 2004; Junge et al., 2016; Marcus, 2009) and increased risk for postpartum depression (Robertson et al., 2004).

Depression in fathers-to-be is understudied relative to mothers, however, emerging research has reported that men also experience emotional changes (Åsenhed et al., 2014) while their partner is pregnant and are at an increased risk for depression during the gestation of their baby and throughout the postpartum period (Kim & Swain, 2007; Matthey, Barnett, Kavanagh, & Howie, 2001; Paulson & Bazemore, 2010; Ramchandani et al., 2008). Paulson and Bazemore

(2010) estimate that 10% of men will experience depression during the postpartum period, whereas Field, Diego, et al. (2006) found that 32% of fathers in a diverse, low to middle income sample were depressed during pregnancy. Furthermore, the transition to parenthood for men is associated with depressive relapse that not only affects the father, but also the mother and later, the child as well (Paulson et al., 2006; Ramchandani et al., 2008). Due to the pervasive, family-level effects of parental psychopathology, protective factors that reduce symptomatology and buffer their effects on parenting are critically needed.

Although there are currently no data examining trauma in expectant fathers, one known risk factor for the development of depression for expectant mothers is a woman's trauma history (Biaggi, Conroy, Pawlby, & Pariante, 2016). As defined by the DSM-5 (APA, 2013), a traumatic event may include exposure as a victim or witness to interpersonal violence, natural and human-made disasters, medical illness, serious accidents and unexpected death (APA, 2013). Although most people will experience at least one traumatic event in their lifetime, (Kilpatrick et al., 2013), some individuals exhibit greater resilience and do not experience extreme trauma symptomology in response to the event, and therefore do not meet clinical criteria for a PTSD diagnosis (Goel, Amatya, Jones, & Ollendick, 2013). Women who live in low-income, urban communities are more likely to be exposed to violence (Breslau, Davis, & Andreski, 1995), which may place them at increased risk for the development of psychiatric symptoms such as depression, anxiety and post-traumatic stress. Silverstein, Feinberg, Sauder, Egbert, and Stein (2010) found that, in a sample of urban mothers of young children, 29% met criteria for depression, 17% had symptoms indicating likely post-traumatic stress disorder (PTSD), and 31% had both positive depression screens as well as a history of significant trauma. Other research has demonstrated that 84.5% of women with antenatal depression also had comorbid partial or full PTSD, suggesting that depression during the

perinatal period is often comorbid with other disorders (Seng et al., 2009). Prior work has demonstrated that pregnant women experience nearly twice the risk of a PTSD diagnosis compared to non-pregnant women (Cook et al., 2004; Seng et al., 2009), and some posit that this is due to the fear of childbirth triggering a trauma reaction (Söderquist, Wijma, & Wijma, 2004). The risks of trauma exposure extend beyond trauma symptoms in the mother to the health of the child; a pregnant woman's own history of child maltreatment is positively associated with the risk of premature birth and delivering a low birth weight baby (Seng, Low, Sperlich, Ronis, & Liberzon, 2011). Furthermore, maternal trauma history is associated with lower child socio-emotional development at 12 months of age (Folger et al., 2017).

Mindfulness

Mindfulness is defined as the capacity to deliberately shift awareness to the present moment in a non-judgmental and compassionate way (Kabat-Zinn, 1982). Dispositional mindfulness is conceptualized as both a foundational *trait* characteristic and also as a temporary *state* of mind that may increase through mindfulness practice (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Evidence suggests that all people have some level of mindfulness without any training, and training in mindfulness increases this trait (K. W. Brown & Ryan, 2003). Links between mindfulness and depression are identified in the general population (Segal, Williams, et al., 2002; Teasdale et al., 2000) and in pregnant women (Dimidjian et al., 2015a; Duncan & Bardacke, 2010; Felder et al., 2016; Miklowitz et al., 2015), with higher levels of mindfulness associated with lower levels of depressive symptoms. Furthermore, higher trait mindfulness is linked to lower posttraumatic stress symptoms in violence exposed individuals (A. Bernstein, Tanay, & Vujanovic, 2011; Garland & Roberts-Lewis, 2013; Smith et al., 2011; B. L. Thompson

& Waltz, 2010), and greater ability to adjust psychologically after a potentially traumatic event (R. W. Thompson, Arnkoff, & Glass, 2011).

Despite the potential for mindfulness interventions to reduce psychiatric symptoms and improve wellbeing during pregnancy, especially in individuals who are most vulnerable to psychopathology, much of the extant research on mindfulness in pregnancy is focused on middle to high-income, educated women. Little is known about mindfulness in pregnant women's partners, and even less is known about expectant parents from culturally and socio-economically diverse backgrounds. To date, only two mindfulness studies have included low-income, diverse, pregnant populations. Goodman and Dimidjian (2013) reported positive attitudes towards the possibility of using Mindfulness Based Cognitive Therapy (MBCT) in a sample of low-income, African-American women with postpartum depression. H. Zhang and Emory (2015) found that in a sample of 34 pregnant, low-income, African American women, a mindfulness-based intervention resulted in decreased prenatal stress and depression up to one-month postpartum. A third study investigated the effects of meditation performed four times per week for 30 minutes in a diverse, non-pregnant sample and found a reduction in blood pressure, heart rate, anxiety and depression symptoms after 12 weeks of practice (Bell, 2015). These results suggest that mindfulness-based interventions may be an effective way to reduce depression and trauma symptoms in diverse, urban, expectant parents. However, except for the above-mentioned intervention studies, very little is known about the foundational levels of trait mindfulness during pregnancy in mothers living in high-risk contexts.

In addition to the dearth of studies examining mindfulness in high risk samples, very few interventions include fathers, therefore very little is known. However, it is known that a father's depression can negatively impact his family (Kim & Swain, 2007), and is related to increased

maternal depression (Paulson & Bazemore, 2010), emotional and behavioral challenges in his children (Ramchandani, Stein, Evans, & O'Connor, 2005) as well as increased conflict in the couple relationship (Letourneau et al., 2012). This is observed in both married and cohabitating relationships, with a higher rate of depression in cohabiting couples (S. L. Brown, 2000). Moreover, partner psychological support, which may be higher and more frequently expressed for couples who are actually living together, is a protective factor for maternal postpartum depression. Unfortunately, few interventions currently include the mother's partner; only one mindfulness-based intervention to date includes both mothers and their partners (Duncan & Bardacke, 2010). Therefore, understanding the partner's psychopathology in relation to trait mindfulness may aid in developing inclusive interventions that have the potential to benefit the entire family.

To date, no research examines the relationship between mindfulness, depressive and trauma symptoms in both expectant mothers and fathers from a diverse, high-risk context. In the current study, this gap will be filled by examining the association between dispositional mindfulness, depression, and trauma symptoms in a sample of predominantly high-risk, expectant mothers and fathers from a metropolitan, Midwestern city in the United States. We expected that depression and trauma symptoms would be positively correlated with each other and negatively correlated with mindfulness, consistent with similar research in low-risk populations. We further hypothesized that both mindfulness and trauma symptoms would predict depressive symptoms in expectant mothers and fathers.

Methods

Procedure

Participants for this study were drawn from a larger longitudinal study (N=102) examining the influence of bio-psycho-social-spiritual factors on early parenting processes in pregnancy

(Dayton et al., 2016; Dayton, Matthews, Hicks, & Malone, 2017). Inclusion criteria were adult status, English fluency, a medically uncomplicated singleton pregnancy, and the participation of both biological parents; however, parents were not required to be in a sustained romantic relationship with each other. Parents were recruited from obstetrics clinics, social services agencies, and local community establishments using recruitment fliers and through online advertisements on the hosting university's website. Interested parents were screened for inclusion and exclusion criteria. Eligible parents completed self-report questionnaires and participated in qualitative interviews at a university-based, developmental research laboratory. Physiological and behavioral data were also collected as a part of the larger study. This paper reports findings exclusively from the self-report questionnaires. Parents were provided monetary compensation for their participation and the study was approved by the hosting university's institutional review board (IRB).

Sample Characteristics

Expectant parents (N = 102, 51 mothers and 51 fathers) aged 18 to 48 (M = 27.7, SD = 6.5) from a metropolitan/urban city participated in the study. Demographics are reported in Table 1. The most frequently reported ethnicity was African American (58.8%), followed by Caucasian (27.5%). 47.8% of parents had no other children. The sample was considered high risk for the development of parenting problems due to high rates of violence exposure and psychopathology (see (Dayton et al., 2017) for a detailed description of sample characteristics).

Table 1

Demographics (N=102)

Variable	Overall (%)	Women (%)	Men (%)

Race / Ethnicity			
African American	58.8	58.8	58.8
Caucasian	27.5	29.4	25.5
Biracial	6.9	5.9	7.8
Asian-Pacific	3.9	3.9	3.9
Other	2.0	2.0	3.9
Age			
18-25	47.1	49.0	45.1
26-30	18.6	17.7	19.6
31-40	31.4	31.3	31.3
40-48	2.9	2.0	4.0
No. of Children			
0	47.8	54.2	40.9
1	31.5	20.8	43.2
2 or more	20.7	25.1	15.9
Resident Status			
Living Apart from baby's other parent	73.2		
Relationship Status			
Married	38.2		
In relationship with baby's other parent	91.2		
Divorced	0.0		
Under Federal Poverty Line	48.4	45.8	51.1
Education Completed			
Some High School	11.8	9.8	7.8
High School/GED	19.6	11.8	27.4
Some College	35.3	39.2	31.4
College/Trade School	23.5	26.5	27.5
Graduate School	9.8	13.7	5.9
Employment			
Unemployed	41.2	49.0	33.3
Part Time	15.7	21.6	9.8
Full Time	43.1	29.4	56.9
Have Been Arrested	27.2	9.8	46.0

Measures

Demographics. Demographic information was collected from each participant and included, although not exclusively, age, race, gender, income level, and education.

Edinburgh Postpartum Depression Scale (EPDS). The EPDS (Cox, Holden, & Sagovsky, 1987) is a 10-item self-report questionnaire that assesses levels of depressive symptoms over the past two weeks during the perinatal period in mothers and fathers (Madsen & Juhl, 2007;

Perren et al., 2005). Items highlight cognitive and affective symptoms of depression (e.g. "*I have blamed myself unnecessarily when things go wrong*" and "*I have been able to laugh and see the funny side of things*") while de-emphasizing somatic symptoms that are common in pregnancy. Individual items are scored 0-3 on a Likert scale and sum scores ranging from 0 to 30 are calculated. In community settings, a score of ten and greater is suggestive of depressive symptoms that may indicate clinical levels of depression. Most studies use cut off scores, typically ranging from 9 to 12. Validation studies find reliability to be consistently high (alpha = .80; Eberhard-Gran, Eskild, Tambs, Opjordsmoen, & Samuelsen, 2001). This study's Cronbach's alpha for this sample was calculated as .83.

Trauma Symptoms Checklist (TSC-40). The TSC-40 (Briere & Runtz, 1989) is a 40-item self-report measure of symptomology in adults resulting from childhood or adult traumatic experiences. It measures features of posttraumatic stress as well as other symptoms found in some traumatized individuals. Respondents are asked to rate how frequently they have experienced each symptom in the last two months using a 4-point frequency rating scale ranging from 0 (never) to 3 (often). In addition to yielding a total score (ranging from 0-120), the TSC-40 contains six subscales: Anxiety, Depression, Dissociation, Sexual Abuse Trauma Index, Sexual Problems, and Sleep Disturbances. Studies using the TSC-40 indicate it is a reliable measure (subscale alphas typically range from .66 to .77, with alphas for the full-scale averaging between .89 and .91). The TSC-40 and its predecessor, the TSC-33, have predictive validity regarding a wide variety of traumatic experiences (Elliott & Briere, 1992). The Cronbach's alpha for the current study is .95.

Five Facets of Mindfulness Questionnaire (FFMQ). The FFMQ (Baer et al., 2006) is a 39-item self-report measure built on a factor analytic study of five individually developed mindfulness questionnaires that yielded five factors of core aspects of mindfulness: 1) observing;

2) describing; 3) acting with awareness; 4) non-judging of inner experience; and 5) non-reacting to inner experience. Items are rated on a 5-point Likert scale ranging from: 1 (never or very rarely true) to 5 (very often or always true). The scales may be combined for an overall level of dispositional (e.g., trait) mindfulness with a sum score ranging from 39 to 195. Prior work has established that the subscales demonstrate good internal consistency ranging from .75 (Non-reactivity) to .91 (Describing) (Baer et al., 2006). This measure has not been validated with a sample of Black/African-American individuals. The Cronbach's alpha for the full scale for this study was .84.

Analytic Plan

Descriptive analyses were performed to determine the average levels of mindfulness, depression and trauma symptoms in the overall sample, as well as by parent gender. Bivariate correlational analysis was performed to evaluate the direct associations of study variables, including sub-scales of dispositional mindfulness. Independent t-tests analyzed differences in potential covariates such as race, gender, poverty, and cohabitation status on the outcome of depression symptoms. Independent t-tests were also performed to understand differences in mindfulness in those who were below and above common depressive symptom cutoff scores of 9, 10, and 12. The significant potential covariates from the bivariate correlations and independent variables were then entered into a hierarchical regression to examine the effects of trauma symptomology and dispositional mindfulness on depressive symptoms. The significantly correlated covariate, cohabitation, was entered in the first step. Trauma symptoms are entered in the second step, and individual sub-scales of mindfulness in the third step.

Results

Data Screening and Preliminary Analyses. Prior to conducting the analyses, data were examined statistically and graphically to verify quality of data and identify any potential outliers. There was no evidence of incorrect values, univariate outliers (i.e., z-score <-3 or >+3; Tabachnick, Fidell, & Osterlind, 2001) or multicollinearity of predictor variables (VIF <2; Allison, 2012). The probability of Mahalanobis distance was used to identify multivariate outliers ($p < .001$), and there were no indications of outliers in the dataset. All variables met the assumptions of normality, linearity, and homoscedasticity. The mice package (version 2.30; 2017) was used in the statistical programming language R (version 3.3.3; 2017) to create 5 separate data sets. Missing values on all predictor variables were imputed using multiple imputation by chained equations (MICE). Of the 102 participants six people did not complete the EPDS questionnaire, 17 did not complete the FFMQ (due to late addition into the study), and eight did not complete the TSC questionnaire.

Descriptive Analysis. Nearly a third (32.9%) of participants endorsed levels of depressive symptomology equal to or greater than nine, indicating elevated depression symptoms, and 16.5% endorsed levels associated with a diagnosis of clinical depression, indicated by scores of 12 or greater (Murray & Cox, 1990). Trauma symptoms ranged from 0 (no symptoms) to 79, with an average of 21.63.

Table 2

Descriptive analyses of mindfulness, trauma and depression symptoms by Gender.

Variable	Mean (SD)		
	Overall	Women	Men
Depressive Symptoms	6.77 (5.01)	7.63 (5.50)	5.94 (4.61)
Trauma Symptoms	21.63 (18.53)	23.53 (19.90)	19.72 (17.04)
Dispositional Mindfulness Total	135.14 (17.92)	139.05 (15.70)	131.14 (19.32)
Observe	26.88 (7.15)	28.56 (5.89)	25.17 (7.96)
Describe	28.78 (5.95)	29.53 (5.61)	28.00 (6.24)
Awareness	28.89 (6.20)	29.58 (6.10)	28.19 (6.28)

Nonjudgmental	28.04 (5.55)	28.70 (5.56)	27.36 (5.52)
Nonreactivity	22.55 (4.82)	22.67 (4.96)	22.43 (4.72)

Note: EPDS = Edinburgh Postpartum Depression Scale; TSC = Trauma Symptoms Checklist; FFMQ = Five Facets of Mindfulness Scale.

Correlational Analyses. Pearson bivariate correlations indicated that total dispositional mindfulness scores were significantly negatively associated with depression (r=-.488, p<.01), and trauma symptoms (r=-.372, p<.01). In addition, all mindfulness subscales were negatively associated with depression and trauma symptoms, except for the ability to observe one's own thoughts which was non-significant. Full correlation results are presented in Table 3.

Table 3

Correlation of mindfulness, depression and trauma symptoms (N=102)

		1	2	3	4	5	6	7
1	EPDS	1						
2	Observe	-.14	1					
3	Describe	-.36**	.44**	1				
4	Awareness	-.22*	-.05	.44**	1			
5	Nonjudgement	-.37**	-.26*	.18	.39**	1		
6	Nonreactivity	-.46**	.39**	.42**	.11	.01	1	
7	FFMQ total	-.49**	.56**	.83**	.62**	.41**	.60**	1
8	TSC	.67**	.06	-.27*	-.34**	-.43**	-.37**	-.37**

*p < .05; **p < .01. *Note:* EPDS = Edinburgh Postpartum Depression Scale; FFMQ = Five Facets of Mindfulness Scale; TSC = Trauma Symptoms Checklist.

Independent T-Test Analyses. An independent t-test revealed no significant differences in mean depression scores across gender, race or poverty status. There was, however, a difference in depressive symptom levels for cohabitating parents compared to non-cohabitating parents, t(94)=-1.99, p=.05, with the cohabitating parents endorsing more depressive symptoms.

Cohabitation was, therefore, entered into the subsequent regression models where depression was the dependent variable. A significant gender difference was detected for the total mindfulness scale, $t(83)=2.07$, $p=.04$ and the ability to observe one's own thoughts subscale, $t(83)=2.24$, $p=.03$ with women exhibiting higher levels of mindfulness. An independent t-test was performed to test whether dispositional mindfulness was lower in parents reporting higher levels of depressive symptomatology and demonstrated that, at each commonly used depressive symptom cutoff level, parents with fewer depressive symptoms were higher on mindfulness (see Table 4).

Table 4

Independent t-tests comparing total mindfulness scores by depression (N=102)

Depressive Symptom Cutoff	Mindfulness total *M* (*SD*)	%	*t*	*D*	*r*	*p*
EPDS < 9	139.58 (18.11)	32.9	8.5	0.85	0.39	<.001
EPDS ≥ 9	126.11 (13.31)	67.1				
EPDS < 10	139.20 (17.67)	24.7	9.78	1.10	0.48	<.001
EPDS ≥ 10	122.76 (11.55)	75.3				
EPDS < 12	137.70 (17.70)	16.5	7.72	1.03	0.46	<.001
EPDS ≥ 12	122.14 (11.90)	83.5				

Note: EPDS scores of 9, 10 and 12 are commonly used to identify risk. The cutoff of 12 is associated with a greater likelihood of a clinical depression diagnosis.

Hierarchical Linear Regression. Separate hierarchical regression models were employed to test whether trauma symptoms and mindfulness (total and subscales) were significantly associated with depressive symptoms (Table 5 & 6). In each regression model, dispositional mindfulness was found to be significantly negatively associated with depressive symptoms, after controlling for cohabitation ($\beta = -.010$, $p < .01$). Although it was not significant in Model 1 (Table 5), cohabitation predicted 4.4% of the variance in step 1, trauma symptoms were significant and

predicted an additional 28.6% in step 2, and total dispositional mindfulness significantly predicted an additional 7.5% of the variance in step 3. Further, the ability to be nonreactive to one's own thoughts was the only mindfulness subscale that was significantly associated with depressive symptoms (β = -.041, p < .001) in Model 2 (Table 6). Trauma symptoms were significantly associated with depressive symptoms in both models.

Table 5

Hierarchical Regression of trauma symptoms and total mindfulness score on depression symptoms (N=102)

Variable	β	*SE(B)*	ΔR^2
Model 1:			
Step 1			.04
Cohabitating	.27	.13	
Step 2			.33***
Cohabitating	.10	.11	
TSC	.02*	.00	
Step 3			.41***
Cohabitating	.14	.11	
TSC	.02***	.00	
FFMQ	-.01**	.00	

*p < .05; **p < .01; ***p < .001. *Note:* ΔR^2 = Change in R^2; β = standardized regression weights; FFMQ = total score of dispositional mindfulness, TSC = trauma symptoms checklist total score; EPDS = Edinburgh postpartum depression scale.

Table 6

Hierarchical Regression of mindfulness subscale scores and trauma symptoms on depression symptoms (N=102)

Variable	β	*SE(B)*	ΔR^2
Model 2:			
Step 1			.04

Cohabitating	.27	.13	
Step 2			.33***
Cohabitating	.10	.11	
TSC	.02*	.00	
Step 3			.48***
Cohabitating	.08	.11	
TSC	.02***	.00	
Observe	.00	.01	
Describe	-.01	.01	
Awareness	.01	.01	
Nonjudgement	-.01	.01	
Nonreactivity	-.04***	.01	

*$p < .05$; **$p < .01$; ***$p < .001$. *Note:* ΔR^2 = Change in R^2; β= standardized regression weights; TSC = trauma symptoms checklist total score.

Discussion

The purpose of this study was to explore levels of dispositional mindfulness and its relationship with depressive and trauma symptoms in expectant mothers and fathers living in a high-risk context. To date this relationship has not been explored in this specific population. This represents a critical gap in the literature and limits our ability to disseminate mindfulness research with at-risk parents-to-be and to inform the development of early interventions with these groups. As predicted, higher levels of mindfulness were associated with lower levels of depressive and trauma symptoms. Regression analyses revealed that levels of dispositional mindfulness (i.e., total score and the non-reactivity subscale score) and trauma symptoms were significantly associated with depressive symptoms in the expected directions.

Extant research reports a negative correlation between depressive symptoms and dispositional mindfulness (Davidson, 2016; Segal, Williams, & Teasdale, 2013), however little is known about this relationship in populations exposed to adversity, and less is known about mothers and fathers during pregnancy. With the surge of popularity of mindfulness-based interventions to

treat depression, it is important to understand the interaction of mindfulness and depressive symptomology in diverse populations. The current study's findings support previous findings from low-risk, non-pregnant groups (H. C. Dixon & Overall, 2016) in that mindfulness scores were significantly lower in individuals who endorsed higher levels of depressive symptoms. These findings increase the generalizability of the association of dispositional mindfulness and depressive symptoms to at-risk groups of expectant parents. Although the cross-sectional nature of this study precludes the determination of direction of effects, the data do suggest that interventions that increase mindfulness may also decrease symptoms of depression in higher risk groups, as they have been shown to do in lower risk groups (Dimidjian et al., 2015a; Felder et al., 2016).

Consistent with prior work with pregnant women living in high-risk contexts (Celaya et al., 2017), depressive symptoms were high in the current sample, with 31.3% of expectant parents considered at risk for depression. Notably, the women did not exhibit higher levels of depressive symptoms than men during pregnancy as hypothesized. Prior work has demonstrated that women report higher instances of depression than men both in pregnancy (Paulson & Bazemore, 2010) and outside of pregnancy (Wittayanukorn, Qian, & Hansen, 2014). Research has reported that men do experience depression in pregnancy, however at lower rates than women (Sundström Poromaa, Comasco, Georgakis, & Skalkidou, 2017). However, most research on perinatal depression focuses on the women's experience and to date, no research has been conducted that explores depression prevalence in risk-exposed expectant fathers. The current work suggests that fathers in higher risk groups may be experiencing depression at rates higher than previously thought. Since prenatal depression is also linked to later postpartum paternal depression (Paulson, Bazemore, Goodman, & Leiferman, 2016) and child outcomes (Ramchandani et al., 2008), these findings

suggest that both parents should be included in screening and treatment of antenatal depression, especially in communities exposed to risk. Unfortunately, existing health care systems are not designed to assess or to treat the father during prenatal and postnatal care. Therefore, there are few, if any, instances to screen fathers for mental health concerns. Health care providers should be aware of the risk for fathers to experience perinatal depression and the effects this has on children so they may support the father during the pregnancy. Some providers express difficulty in doing this as the father is technically not their patients (Alio, Lewis, Scarborough, Harris, & Fiscella, 2013). Policies at the state and federal level should consider ways to engage fathers during the transition to fatherhood. Perhaps insurance companies could cover one (or more) prenatal visits for a father expecting a child to ensure he has the supports he needs. Infant mental health programs may begin to tailor services to fathers and other caregivers in addition to mothers.

A significant difference was identified in the current study with regard to gender and mindfulness, with expectant mothers exhibiting higher mean total mindfulness scores compared to expectant fathers. These findings diverge from those reported by Soysa and Wilcomb (2015) who found no differences by gender in mindfulness in a low-risk sample of college students. It is unclear why this gender difference exists in the current sample. One explanation for the current findings may be that the questions included in the mindfulness questionnaire (FFMQ) may not be ecologically or culturally relevant to people (and potentially specifically men), living in higher risk environments. It may be that stressors such as community violence, which are much more common in low-income neighborhoods make it especially difficult to be dispositionally mindful for these men. Further, the mindfulness measure (FFMQ) has not been validated with groups of African American men, and may not be a valid assessment of their daily, lived experiences. For example, one question states, “I perceive my feelings and emotions without having to react to them”. This

could elicit a different response from an individual (male or female) living in a community with high rates of violence compared to individuals who are not exposed to significant violence on a daily basis. For instance, an individual living in a violence-exposed neighborhood may have internalized a cultural expectation that values and encourages reacting to situations as a self-protective strategy. Further, given gender norms, this strategy may be valued in men more than women. Another item illustrating the potential lack of generalizability of the measure across diverse cultures states, "while walking, I deliberately notice the sensations of my body moving". An individual who walks in a neighborhood with high crime rates may not experience the privilege of walking and noticing their bodily sensations as they may be vigilantly surveying their immediate environment to ensure their safety. Further research should examine the meaning and validity of mindfulness measures across different races and cultures. Potentially, there may be times when being mindful is not appropriate as it may lessen the body's automatic response to react to a dangerous situation. For many individuals, the fight or flight reaction may be a necessary mode for survival on a daily basis.

The high comorbidity of trauma and depressive symptoms found in this, and other studies (Oh et al., 2016; Silverstein et al., 2010; Wittayanukorn et al., 2014) point to the importance of engaging in trauma-informed care when intervening with depressed populations. Even in evidence-based, trauma-informed treatments, there is a high level of attrition because tolerating intense emotion is often too difficult for trauma-exposed participants (Rakofsky, Levy, & Dunlop, 2011). With the rapid dissemination of mindfulness-based intervention in a wide range of contexts, it is imperative that both training of practitioners and treatment intervention protocols employ trauma-informed protocols within their intervention models. Some specific trauma-informed mindfulness-based interventions exist and have identified best practices such as providing options

to participants for protocol adaptations during the mindfulness practice to allow each participant to adapt the techniques as necessary. Some adaptations include the choice to leave one's eyes open during the meditation and choosing to end the meditation early. Other instructor-driven adaptations include the importance of keeping practices short and very concrete, including trauma-informed yoga practices in the protocol, and remaining attentive to language that may be triggering for some participants (Emerson, Sharma, Chaudhry, & Turner, 2009; Kelly & Garland, 2016; King et al., 2013; Magyari, 2014).

Although this study makes an important contribution to the mindfulness literature and is the first to examine the relationship between mindfulness, trauma and depression in expectant, risk-exposed mothers and fathers, there are also some limitations. The current sample size was relatively small and future studies should include larger samples to allow a greater understanding of possible mechanisms of mindfulness in high-risk contexts. Furthermore, we did not exclude participants with experience in a contemplative practice that may affect their level of mindfulness. In addition, the cross-sectional nature of this study prevents the determination of causality. One hypothesis is that improved mindfulness may decrease psychiatric symptomology such as depression, however, this is still unknown and longitudinal studies are necessary to test the direction of effects. Data in the current study relied on self-report questionnaires and future studies could employ semi-structured clinical interviews as well as qualitative interviews to gain more in-depth and nuanced information about mindfulness and its correlates in at-risk populations. Additionally, it may be that aspects of the mindfulness measure may not be valid in higher violence exposed communities or in some cultural groups. Future research should examine the validity of mindfulness measures for use in high-risk contexts. Despite these limitations, the study had

significant strengths as well, particularly the use of a diverse, urban sample of expectant parents, and the inclusion of fathers.

Conclusion

The results of this study highlight the importance of mindfulness as a potential resiliency factor in mitigating the influence of trauma and depressive symptoms in a group of diverse, mainly low-SES, expectant parents. Mindfulness was found, as hypothesized, to be a significant predictor of depressive symptoms in both men and women during pregnancy. Mindfulness was also found to be lower in those who had higher levels of depression, adding to the evidence of the interplay of mindfulness and psychopathology in pregnancy. This is the first study of its kind to examine mindfulness and depression in a risk-exposed group of expectant mothers and fathers. Findings suggest that improving overall mindfulness in risk-exposed, expectant parents may reduce symptoms of depression and trauma. Future research should develop mindfulness-based interventions for culturally diverse and violence exposed groups. Due to the comorbidity of trauma and depression symptoms in this sample, trauma-informed mindfulness approaches are warranted.

CHAPTER 3 MINDFULNESS AND TRAUMA SYMPTOMS PREDICT CHILD ABUSE POTENTIAL IN RISK-EXPOSED, EXPECTANT MOTHERS AND FATHERS

Introduction

Child maltreatment represents one of the most serious health concerns facing children in the United States today. The U.S. Department of Health and Human Services (US DHHS) reports that there were 702,000 known victims of child abuse or neglect reported in 2014 (U.S. Department of Health and Human Services, Administration on Children, Youth and Families [US DHHS], 2016). Child maltreatment includes physical, emotional and sexual abuse, as well as physical and emotional neglect to a child by their parent or caregiver. Very young children are the most vulnerable to child maltreatment; children aged birth to one year are at greatest vulnerability of being a victim of maltreatment (US DHHS, 2016) and 70.7% of all fatalities due to child maltreatment occur to children under the age of three years. Not only are very young children the most likely to experience and perish from exposure to child maltreatment, but trauma experiences in the first few years of life, especially by a caregiver, have significant repercussions related to behavioral outcomes, educational success, and mental and physical health sequelae (Behl, Conyngham, & May, 2003; Gilbert et al., 2009). A history of child maltreatment exposure is also associated with subsequent substance abuse (Appleyard et al., 2011), social isolation (Berlin et al., 2011), aggression (Berlin et al., 2011), mental health difficulties (Fergusson, Boden, & Horwood, 2008), young parental age (L. Dixon, Browne, & Hamilton-Giachritsis, 2005) and adult relationship challenges, including interpersonal violence (Renner & Slack, 2006). Therefore, due to the serious negative outcomes associated with early childhood maltreatment, identification of parents who may be at risk for maltreating their children is imperative so that preventive interventions that interrupt the development of abusive parenting practices can be implemented.

Valid and reliable screening tools such as the Child Abuse Potential Inventory (Milner, Gold, Ayoub, & Jacewitz, 1984) and the Brief Child Abuse Potential Inventory (Ondersma, Chaffin, Mullins, & LeBreton, 2005) have been developed to identify parents who exhibit risk factors associated with the potential to perpetrate child physical abuse. These screening tools are widely used and have been successful in distinguishing between abusive and non-abusive parents (Milner, 1994; Milner et al., 1984; Milner, Gold, & Wimberley, 1986) and can aid clinicians in the identification of families who would benefit from preventative services. Because of the deleterious effects on very young children who are exposed to child abuse, there is a critical need for the very early identification of parents who have the potential to abuse their children so that interventions can be provided during the perinatal period. Responsive to this need, the current study examines potential risk factors for child abuse during the prenatal period in a sample of diverse, highly adversity-exposed, expectant mothers and fathers. Risk factors that have been identified as influencing postnatal child abuse potential will be examined in the current study and include parental trauma history and trauma symptoms. In addition, the capacity for mindfulness, which has recently been found to be negatively associated with emotion dysregulation (Jager, 2016; McDonald et al., 2016; Roemer, Williston, & Rollins, 2015; Tang et al., 2016) will be examined as a potential resiliency factor.

While the mechanisms that account for child maltreatment perpetration are not fully understood, there is significant evidence regarding specific risk factors that may contribute to increased propensity for child abuse in some parents. For instance, the propensity for child maltreatment is sometimes transmitted across generations. A parent's history of maltreatment has frequently been found to be associated with an increased risk of their own perpetration of abuse, however, there are mixed findings supporting this claim (Cadzow, Armstrong, & Fraser, 1999;

Haskett, Johnson, & Miller, 1994). For example, Appleyard et al. (2011) found that exposure to childhood abuse was a significant predictor of intergenerational transmission of abuse, however, if the parent experienced only neglect, there was no significant link. Further, the prevalence rates of intergenerationally transmitted abuse vary widely across studies and are not a sole predictor of child abuse potential in the adult parent (Berlin et al., 2011).

Supported by empirical findings, trauma theory posits that current trauma symptomology may be a significant factor contributing to child maltreatment perpetration. A study by Milner et al. (2010), for example, found that trauma symptoms partially mediated the effect of child abuse history on child abuse potential. In addition, Cadzow et al. (1999) reported that environmental risks (e.g., poverty, community violence exposure), often prevalent in urban areas, may disrupt parental regulatory capacities and place stress on the parent-infant relationship, thereby compromising effective infant care. However, perceived stress and maternal psychopathology (Cadzow et al., 1999) were identified as key risk factors in the perpetration of child maltreatment, even when controlling for environmental risk (Cadzow et al., 1999). This suggests that parental psychopathology may be an important mechanism accounting for the intergenerational transmission of abuse in some families. Because trauma symptoms disrupt adaptive regulatory capacities, trauma, in particular, may be an especially potent risk factor influencing a parents' propensity to perpetrate child maltreatment. Furthermore, protective factors such as mindfulness that have been shown to reduce parental psychopathology may decrease the risk for child abuse.

Mindfulness research has increased dramatically in the last decade, and extant research suggests that there is a strong association between levels of mindfulness and psychopathology, with higher levels of dispositional mindfulness predicting lower levels of trauma symptoms (Boughner, Thornley, Kharlas, & Frewen, 2016; King, Block, Sripada, Rauch, Porter, et al., 2016;

Segal et al., 2013). Mindfulness is defined as the ability to be "present in the moment, without judgment or correction, starting with simple awareness of one's body and thoughts" (Kabat-Zinn, 2003, p. 145). In the case of trauma symptoms, people are often plagued with ruminative thinking, elevated anxiety and avoidance of reminders of their trauma. By noticing and observing an emotional reaction, an individual may realize that the difficult emotion is temporary, or perhaps that other emotions are also present, leading to an improved sense of wellness. The practice of mindfulness enhances the capacity to cognitively differentiate between perception and situational emotional responses, which may increase awareness of emotion and provide the space to act with intention rather than engage in automatic emotional reactions (Desrosiers, Vine, Klemanski, & Nolen-Hoeksema, 2013). Consistent with this argument, higher levels of dispositional mindfulness have been consistently associated with lower levels of trauma symptoms (Banks et al., 2015; Neelarambam, 2015; Ortiz & Sibinga, 2017).

Mindfulness is also a skill that can be taught and the capacity for mindfulness can be strengthened with practice. Many mindfulness interventions focus on just this and are reported to be effective in reducing symptoms in clinical populations (Banks et al., 2015; Bedard et al., 2014; Beddoe, Paul Yang, Kennedy, Weiss, & Lee, 2009; Felleman, Stewart, Simpson, Heppner, & Kearney, 2016; Ives-Deliperi, Howells, Stein, Meintjes, & Horn, 2013; Muzik, Hamilton, Rosenblum, Waxler, & Hadi, 2012; Williams et al., 2014). For example, Mindfulness-Based Cognitive Therapy (MBCT) is demonstrated to be effective in reducing depressive relapse (Davidson, 2016; Felder et al., 2016; Williams & Kuyken, 2012), reducing bipolar symptoms (Ives-Deliperi et al., 2013), anxiety (Narimani & Musavi, 2015; Spijkerman, Pots, & Bohlmeijer, 2016), and post-traumatic stress disorder symptoms (Heffner, Crean, & Kemp, 2016; Kelly & Garland, 2016; Landrum, 2016; Sears & Chard, 2016).

Preliminary research also suggests associations of higher levels of parental dispositional mindfulness with increases in the quality of the parent-child relationship (Coatsworth, Duncan, Greenberg, & Nix, 2010) and decreases in parenting stress (Bögels et al., 2014). For example, one study by Parent, McKee, Rough, and Forehand (2016) examined parents and their children across developmental stages (i.e., 3-17 years old) and found that higher dispositional mindfulness in parents was directly linked to positive parenting practices and lower youth internalizing and externalizing behaviors. Although these studies lend support to the hypothesis that increased levels of mindfulness are positively associated with improved parent-child relationship quality, it is not yet known how mindfulness in pregnancy may affect future parenting in high risk parents.

This study aims to understand the relationship between dispositional mindfulness and trauma symptoms during pregnancy and the potential risk for later child maltreatment. Parents with higher dispositional mindfulness are expected to have lower potential for future child abuse, even when considering known risk factors such as trauma history and trauma symptoms. This information will inform the development of interventions that may ultimately reduce the risk of child maltreatment during the early child rearing years.

Methods

Procedure

Parents were recruited from obstetrics clinics, social services agencies, and local community establishments using recruitment fliers and through online advertisements on the university website. Interested parents were screened for inclusion and exclusion criteria. Eligible parents were invited to the research laboratory, completed informed consent and were informed that they were participating in a study of the influence of early experiences on the development of parenting thoughts and behaviors during pregnancy. The visit included qualitative interviews,

quantitative questionnaires, and biobehavioral data collection as part of a larger study. Mothers and fathers completed all quantitative and physiological aspects of the research protocol separately, even though they attended the visit together. The quantitative questionnaires used in the current analysis took approximately 40 minutes to complete. This paper reports findings exclusively from the four self-report questionnaires described below. Parents were provided monetary compensation for their participation. The research protocol was approved by the university's institutional review board (IRB).

Sample Characteristics

Participants for this study were drawn from a larger longitudinal study (N=102) examining the influence of bio-psycho-social-spiritual factors on early parenting processes in pregnancy. See Dayton, Matthews, Hicks & Malone (2017) for a detailed description of sample characteristics. Inclusion criteria were adult status, English fluency, singleton pregnancy, and the participation of both biological parents; however, parents were not required to be in a sustained romantic relationship with each other. Expectant parents (N = 102, 51 mothers and 51 fathers) aged 18 to 48 (M = 27.7, SD = 6.5) from a metropolitan/urban city participated in the study. The most frequently reported ethnicity was African American (58.8%), followed by Caucasian (27.5%) and 47.8% had no other children. The sample was considered largely at-risk due to high rates of poverty (48.4% under the poverty line) and exposure to community violence with 27.2% of participants reported that they had been arrested before (9.8% female, 46% male).

Table 1

Demographics (N=102)

Variable	Overall (%)	Women (%)	Men (%)
Race / Ethnicity			
African American	58.8	58.8	58.8

Caucasian	27.5	29.4	25.5
Biracial	6.9	5.9	7.8
Asian-Pacific	3.9	3.9	3.9
Other	2.0	2.0	3.9
Age			
18-25	47.1	49.0	45.1
26-30	18.6	17.7	19.6
31-40	31.4	31.3	31.3
40-48	2.9	2.0	4.0
No. of Children			
0	47.8	54.2	40.9
1	31.5	20.8	43.2
2 or more	20.7	25.1	15.9
Resident Status			
Living Apart from baby's other parent	73.2		
Marital Status			
Married	38.2		
In relationship with baby's other parent	91.2		
Divorced	0.0		
Under Federal Poverty Line	48.4	45.8	51.1
Education Completed			
Some High School	11.8	9.8	7.8
High School/GED	19.6	11.8	27.4
Some College	35.3	39.2	31.4
College/Trade School	23.5	26.5	27.5
Graduate School	9.8	13.7	5.9
Employment			
Unemployed	41.2	49.0	33.3
Part Time	15.7	21.6	9.8
Full Time	43.1	29.4	56.9
Have Been Arrested	27.2	9.8	46.0

Measures

Demographics. Demographic information was collected from each participant and included factors such as age, race, gender, income level, and education.

Trauma Symptoms. The Trauma Symptoms Checklist (TSC-40; Briere & Runtz, 1989) is a 40-item self-report measure of symptomatic distress in adults arising from exposure to childhood or adult traumatic experiences. It measures aspects of posttraumatic stress as well as

other symptoms found in some traumatized individuals. Respondents are asked to rate how often they have experienced each symptom in the last two months using a 4-point frequency rating scale ranging from 0 (never) to 3 (often). In addition to yielding a total score (ranging from 0-120), the TSC-40 includes six subscales: Anxiety, Depression, Dissociation, Sexual Abuse Trauma Index, Sexual Problems, and Sleep Disturbances. Studies using the TSC-40 indicate that it is a reliable measure (subscale alphas typically range from .66 to .77, with alphas for the full-scale averaging between .89 and .91;Elliott & Briere, 1992). The TSC-40 and its predecessor, the TSC-33, have demonstrated predictive validity with a wide variety of traumatic experiences. The Cronbach's alpha for the current study is .95.

Childhood Trauma. The Childhood Trauma Questionnaire (CTQ; D. Bernstein & Fink, 1998) is a 28-item self-report measure of adult history of childhood maltreatment with higher scores indicate greater severity of maltreatment. Bernstein and Fink (1998) reported satisfactory reliability coefficient α for each CTQ scale: emotional abuse = .89, physical abuse = .82, sexual abuse = .92, emotional neglect = .89, physical neglect = .66. Scores were stable over a 1 to 6-month period ranging from r = .79 for physical neglect to r = .86 for emotional abuse, and convergent validity with established trauma exposure measures was reported. In the current sample, Cronbach's alphas were .91 for emotional abuse, .90 for physical abuse, .96 for sexual abuse, .92 for emotional neglect, .83 for physical neglect and .90 for the total score.

Five Facets of Mindfulness Questionnaire (FFMQ). The FFMQ (Baer et al., 2006) is a 39-item self-report measure based on a factor analytic study of five independently developed mindfulness questionnaires. Analysis of these five mindfulness questionnaires yielded five factors that capture core aspects of mindfulness: 1) observing; 2) describing; 3) acting with awareness; 4) non-judging of inner experience; and 5) non-reacting to inner experience. Items are rated on a 5-

point Likert scale ranging from: 1 (never or very rarely true) to 5 (very often or always true). The scales may be combined for an overall level of dispositional mindfulness with a sum score ranging from 39 to 195. Prior work has established that the subscales demonstrate good internal consistency ranging from .75 (Non-reactivity) to .91 (Describing) (Baer et al., 2006). The Cronbach's alpha for the full scale for this study was .84.

Child Abuse Potential. The Brief Child Abuse Potential Inventory (BCAP; Ondersma, Chaffin, Mullins & LeBreton, 2005) is a 33-item questionnaire that identifies parents at risk for the perpetration of child maltreatment. The BCAP is a brief version of the Child Abuse Potential Inventory (CAPI) which was developed using a relatively large sample of parents (N=1470), and cross-validated with an additional sample of 713 parents. The BCAP was found, in both of these studies, to be reliably predictive of future child protective services reports. On cross-validation, scores from the resulting 24-item risk scale demonstrated an internal consistency estimate of .89, a stable 7-factor structure, and substantial correlations with the CAPI abuse risk score (r = .96). The CAPI risk cut-off was predicted with 93% sensitivity and 93% specificity (area under the ROC curve = .98), and the BCAP and CAPI demonstrated similar patterns of external correlates. The BCAP may be useful as a time-efficient screener for abuse risk. The full-scale Cronbach's alpha for the current study was .81. The current study utilized the 33-item questionnaire.

Results

Prior to conducting the analyses, data were examined statistically and graphically to verify quality of data and identify any potential univariate outliers (Tabachnick et al., 2001). VIF (<2) for all study variables were examined to investigate potential multicollinearity (Allison, 2012). The analyses provided no evidence of incorrect values, univariate outliers (i.e., z-score <-3 or >+3 standard deviations) or multicollinearity of predictor variables (Allison, 2012). SPSS version 24

was used for multiple imputation and statistical analyses (IBM Corp., 2016) was used to handle missing data. Data were missing due to individual measures that were not completed by some participants. Of the 102 participants, 17 did not complete the FFMQ, 8 did not complete the TSC, 10 did not complete the BCAP, and 8 did not complete the CTQ questionnaires.

Due to the power limitations of this study, only those variables statistically significant in bivariate correlation analyses (p=.05) are included in the multivariate regression model. A bivariate correlational analysis was performed to evaluate the direct associations of study variables, including sub-scales of dispositional mindfulness and childhood trauma. The significant correlates were then included in a hierarchical regression to examine the direct effects of current trauma symptoms, childhood trauma history and dispositional mindfulness on the potential for child abuse. Demographic SES variables that were correlated with BCAP were controlled for in the first step. Trauma symptoms were entered in the second step, trauma history subscales in the third step and individual sub-scales of mindfulness in the fourth step.

Correlations. Pearson bivariate correlations indicated that total dispositional mindfulness scores were significantly negatively associated with potential risk for future child abuse (r=-.32, p<.01). Three mindfulness subscales were also negatively associated with potential risk for child abuse; acting with awareness (r=-.24, p<.05), the ability to be nonjudgmental to one's own thoughts (r=-.35, p<.01), and the ability to be nonreactive to one's own thoughts (r=-.33, p<.01). Potential risk for child abuse was also positivity correlated with current trauma symptoms (r=.53, p<.01) but not with history of trauma exposure. Full correlation results are presented in Table 7.

Table 7

Correlation of BCAP, FFMQ, TSC and CTQ (N=102)

		1	2	3	4	5	6	7	8
1	BCAP	1							
2	Observe	.08	1						
3	Describe	-.19	.37**	1					
4	Awareness	-.24*	-.08	.42**	1				
5	Nonjudgement	-.35**	-.27**	.18	.37**	1			
6	Nonreactivity	-.33**	.33**	.40**	.12	.01	1		
7	FFMQ total	-.32**	.54**	.81**	.61**	.39**	.59**	1	
8	TSC	.53**	.07	-.28**	-.34**	-.41**	-.20	-.36**	1
9	CTQ	.20	-.15	-.10	.02	-.14	-.10	-.16	.17

*p < .05; **p < .01. *Note:* BCAP = Brief Potential for Child Abuse risk score;

FFMQ = Five Facets of Mindfulness Scale; TSC = Trauma Symptoms Checklist;

CTQ = Childhood Trauma Questionnaire

Hierarchical Linear Regression. Independent t-tests were initially performed to determine which potential covariates were correlated with the dependent variable and included gender, race (Caucasian and non-Caucasian), and poverty status (results are available upon request from author). All tests yielded non-significant results and, therefore, no control variables were included in the regression models. Two separate hierarchical regression models were tested to investigate whether trauma symptoms, childhood trauma experiences and mindfulness (total and subscales) were significantly associated with child abuse potential (Table 8 & 9).

In the first regression model (Table 8), total dispositional mindfulness, trauma symptoms, and childhood trauma were examined as predictors of child abuse potential. Dispositional mindfulness total score was found to be significantly negatively associated with potential risk for child abuse in steps 1 and 2. However it was no longer significance once trauma symptoms were added into the model in step 3. When investigating individual mindfulness subscales in the second regression model (Table 9), nonjudgment and non-reactivity to one's own thoughts were significant in steps 1 and 2. Once trauma symptoms were added into step 3, however, only non-

reactivity and trauma symptomology remained significant. Childhood trauma experiences were not significant in any of the models.

Table 8

Hierarchical Regression of mindfulness, childhood trauma, trauma symptoms on potential for child abuse (N=102)

Variable	*B*	*SE(B)*	ΔR^2
Model 1:			
Step 1			.12**
FFMQ	-.08***	.03	
Step 2			.02
FFMQ	-.08**	.03	
CTQ	.05	.03	
Step 3			.18***
FFMQ	-.03	.02	
CTQ	.03	.03	
TSC	.11***	.02	

Note. ΔR^2 = Change in R^2; *B*= unstandardized regression weights; FFMQ = total score of dispositional mindfulness, TSC = trauma symptoms checklist total score, CTQ = Childhood Trauma Questionnaire. *$p < .05$; **$p < .01$; ***$p < .001$.

Table 9

Hierarchical Regression of FFMQ Subscales, CTQ, TSC on BCAP (N=102)

Variable	*B*	*SE(B)*	ΔR^2
Model 2:			
Step 1			.29***
Awareness	-.06	.08	
Nonjudgement	-.27**	.08	
Nonreactivity	-.31***	.09	
Step 2			.02***
Awareness	-.07	.08	
Nonjudgement	-.25**	.09	
Nonreactivity	-.30***	.09	
CTQ	.04	.03	

Step 3			.10***
Awareness	-.01	.07	
Nonjudgement	-.15	.08	
Nonreactivity	-.24**	.08	
CTQ	.02	.03	
TSC	.09***	.02	

Note. ΔR^2 = Change in R^2; *B*= unstandardized regression weights; TSC = trauma symptoms checklist total score. *$p < .05$; **$p < .01$; ***$p < .001$.

Discussion

This study aimed to understand the relationships between dispositional mindfulness during pregnancy and trauma on the potential risk for later child maltreatment. We hypothesized that parents with higher dispositional mindfulness would have lower potential for future child abuse, even when considering known risk factors of trauma history and trauma symptoms. Our hypothesis was partially supported. While total mindfulness, and the mindfulness subscales of acting with awareness, non-reactivity and nonjudgment were significantly negatively correlated with potential risk for child abuse, only the subscale of non-reactivity was a significant predictor when controlling for trauma history and current trauma symptoms.

Contrary to some existing research (Berlin et al., 2011; L. R. Cohen, Hien, & Batchelder, 2008), exposure to childhood trauma did not predict future child abuse potential in this sample, however current trauma symptomology did. Although experiencing a traumatic event may lead to the expression of trauma symptoms in some individuals, this is not always the case; some violence-exposed individuals never experience a traumatic reaction to the event. The current findings suggest that it may be the development of trauma symptoms, and not exposure itself, that influences child abuse potential.

The current findings suggest that other resiliency factors may also be contributing to wellness into adulthood that may then affect healthy parenting. Recent research posits that stress reduction as well as emotion regulation may lead to healthier, more sensitive parenting (Pereira et al., 2012), which may reduce the propensity for child maltreatment. Increase in mindfulness has been linked to improvements in emotion regulation (Farb, Anderson, & Segal, 2012), physiological stress reactions (Azam et al., 2015; Bhatnagar et al., 2013), symptoms of depression (Davidson, 2016) and trauma symptoms (Banks et al., 2015). This study lends support to the hypothesis that increased mindfulness may also be associated with behaviors that are linked to more sensitive parenting. One of the central practices in mindfulness meditation is to be nonreactive to one's own thoughts, even when a thought is difficult and incredibly emotional. In this study, the mindfulness non-reactivity subscale was the only subscale that retained significance in predicting the risk of child abuse. Teaching mindfulness practices that stress non-reactivity to parents who are at risk for future child abuse may be an effective target for the development of prevention services.

The current study contributes to the extant literature by examining the influence of risk and resilience factors on child abuse potential in a racially diverse sample of both mothers and fathers who are expecting a baby. In addition to the many strengths of the study, there are also some limitations. First, the data collected were cross-sectional which does not allow for the determination of causation. Although the current study did not assess causation, future research that investigates the pre-post effects of mindfulness-based intervention on parents deemed at risk for harsh parenting is warranted. Future research should utilize longitudinal methodology in order to determine the influence of trauma exposure and symptoms of psychopathology on parent, infant and family-level outcomes. In addition, the data relies on self-report measures which introduces

the potential for respondent bias. Finally, the mindfulness measure used in the analyses is not validated for use within culturally diverse samples, including Black /African-American parents who make up the majority of the current sample. Despite these limitations, the current study provides information useful for the development of targeted mindfulness-based interventions for mothers and fathers by identifying risk factors such as trauma symptoms and resiliency factors such as nonreactivity to one's own experience on the potential for postnatal child abuse.

Conclusion

This is the first study of its kind to examine connections between mindfulness and child abuse potential during pregnancy. The results of this study highlight the importance of mindfulness, specifically the ability to be non-reactive to one's own thoughts, as a potential factor that may reduce child abuse potential. This is especially important as this sample of expectant parents is considered at-risk for the development of harsh and abusive parenting due to exposure to contextual risks including violence and poverty. Child maltreatment research has identified potential protective factors that may mitigate risk of abuse, including social connection, nurturing attachment, knowledge of child development, parental resilience, concrete support, and socioemotional competence (Child Welfare Information Gateway, 2013). Further, the factors of parental resilience and socioemotional competence are fundamentally based on the ability to regulate emotion and address challenges without reactivity. Findings from the current study suggest that improving non-reactivity to one's own thoughts in at-risk parents may improve parenting quality and the parent-infant relationship and may thereby improve the resiliency and socioemotional competence that are foundational to sensitive parenting. To fully test this hypothesis, future research that measures mindfulness and parent-infant relational outcomes longitudinally is needed.

CHAPTER 4 THE ASSOCIATION OF RESILIENCY FACTORS AND PHYSIOLOGICAL STRESS REACTIONS IN EXPECTANT PARENTS EXPOSED TO CONTEXTUAL RISK

Introduction

Stress, defined as an interaction between a person and his or her environment that is evaluated as important and personally difficult, (Lazarus, 1966) is a universal human experience. Exposure to stress that is normative within the person's environment and is not life-threatening results in an experience of temporary physiological arousal. Individuals can often master these stressors and their reactions to them, resulting in a feeling of personal accomplishment and growth. Chronic exposure to stress without mastery, or exposure to extreme types of stressors, however, may have deleterious effects on physical, cognitive and mental health functioning (Lupien et al., 2016; Schneiderman, Ironson, & Siegel, 2005). Exposure to violence constitutes an extreme form of stress that places individuals at risk for the development of psychopathology. Most people are exposed to at least one traumatic event in their lifetime (Kilpatrick et al., 2013), and most recover from the traumatic event without serious challenge or psychopathology (Goel et al., 2013). Some individuals, however, appear to be more vulnerable to stress and experience significant suffering as a result. Why then, are some people more resilient in the face of extreme stress and others more vulnerable (Bonanno, 2004)? The current study investigates potential resiliency factors in response to a common parenting stressor in a sample of expectant parents who are characterized as high-risk due to exposure to community violence, low income status, and low educational attainment.

Resiliency Factors for Stress

Resilience is defined as the ability to cope with stress and adapt to adverse life experiences (Connor & Davidson, 2003). Highly resilient individuals appear to have the capacity to be flexible in their adaptation to stress, both mentally (Ong, Bergeman, Bisconti, & Wallace, 2006) and

physiologically (Lü et al., 2016) and are, therefore, able to recover from stressful experiences quickly. They seem to find their way back to their equilibrium more effectively even when exposed to extreme levels of stress such as violence. Further, highly resilient individuals tend to experience improved mental (Hu, Zhang, & Wang, 2015) and physical health outcomes (Nath & Pradhan, 2012). Potential resiliency factors that may protect an individual from stress include: social support (Coker et al., 2002; Razurel, Kaiser, Antonietti, Epiney, & Sellenet, 2016), spirituality (Pargament, 2001) and mindfulness (A. Bernstein et al., 2011; Garland, Gaylord, & Fredrickson, 2011; Nitzan-Assayag, Aderka, & Bernstein, 2015). Social support (S. Cohen & Wills, 1985; Coker et al., 2002), and spirituality (Tartaro, Luecken, & Gunn, 2005) have been frequently identified as factors that promote resiliency whereas mindfulness is a newer field of research with significant potential.

Social support is commonly defined as instrumental, informational or emotional support that is offered by an individual's social network which may include, friends, family, and significant others (Zimet, Dahlem, Zimet, & Farley, 1988). Research demonstrates that when social support is available for expectant parents it is a potential resiliency factor linked to reduced depressive symptoms both prenatally (Field, Diego, Delgado, & Medina, 2013) and postnatally (Razurel, Kaiser, Sellenet, & Epiney, 2013), as well as increased feelings of parental self-efficacy (Razurel et al., 2016). Conversely, the psychological health of the expectant parent may be compromised when support is perceived as inadequate (Da Costa et al., 2015; Milgrom et al., 2008). Individuals with a greater perception of social support are also psychologically healthier even after exposure to potentially traumatic events including: interpersonal violence (Coker et al., 2002), natural disasters (Goel et al., 2013; Zhao, Wu, & Xu, 2013), cumulative trauma (Kendall-Tackett, 2007; Littleton, Grills-Taquechel, Axsom, Bye, & Buck, 2012), and combat exposure (Tsai, Harpaz-Rotem, Pietrzak, & Southwick, 2012).

Another potential resiliency factor, spirituality, has demonstrated mixed effects. In some individuals, especially those who are exposed to a potentially traumatic event, spirituality is sometimes related to guilt, blame or anger towards a higher power (Pargament & Lomax, 2013). For example, Pargament, Koenig, Tarakeshwar, and Hahn (2001) found higher rates of mortality in elderly patients who felt abandoned or unloved by God following exposure to a potentially traumatic event. Conversely, for some, feeling connected to a higher power appears to be protective and may provide hope, meaning, and comfort. It appears that there are important individual differences in whether or not spirituality is experienced as protective. For example, one study found that at least weekly attendance at religious services lowered the physiological effects of stress in elderly women, but not in men (Maselko, Kubzansky, Kawachi, Seeman, & Berkman, 2007). In another study informing the current work, Tartaro and colleagues (2005) found that young adults who scored higher on a spirituality / religiosity self-report questionnaire demonstrated a lower cortisol response to a laboratory stressor (Tartaro et al., 2005). Despite mixed findings, spirituality remains a potential factor that may contribute to resilience in some individuals.

Mindfulness, defined as purposefully paying attention in a non-judgmental way to the present moment (Kabat-Zinn, 2003), has expanded in popularity over the past decade, with extant research supporting links between mindfulness and well-being (Bränström, Kvillemo, Brandberg, & Moskowitz, 2010; Grossman et al., 2004; Matvineko-Sikar, Lee, Murphy, & Murphy, 2016). Mindfulness includes the ability to observe one's own thoughts, feelings and emotions without comparison, rumination, worry, blame or labeling an experience as good or bad. To some extent, mindfulness is believed to be present in all people, even without any formal training in mindfulness practices, and can be described both as a state, and a trait disposition (Baer et al., 2006).

Mindfulness is considered protective against potential negative cognitions or emotions that increase the stress of a challenging experience (Farb et al., 2012). Individuals with higher levels of self-reported dispositional mindfulness have been found to experience lower levels of perceived stress (Zimmaro et al., 2016), depression (Neelarambam, 2015), anxiety (Desrosiers et al., 2013), trauma symptoms (Daigneault, Dion, Hébert, & Bourgeois, 2016; Shipherd & Salters-Pedneault, 2017), and worry (Ruiz, 2014; Verplanken & Fisher, 2014). Further, dispositional mindfulness improves physiological indicators such as cortisol (Zimmaro et al., 2016), and heart rate variability (Kadziolka, Di Pierdomenico, & Miller, 2015) in adults. Whether mindfulness is similarly associated with physiological reactivity to stress in high risk, expectant parents, however, is not yet known.

Stress in Pregnancy

Pregnancy and the transition into parenthood can be a time filled with excitement and happiness, but can also be extremely challenging for many parents, especially when they are exposed to significant psychosocial and environmental stressors (Salm Ward, Kanu, & Robb, 2016). Indeed, the antenatal period is associated with increased psychological distress in many expectant parents; depression affects nearly 20% of pregnant mothers (Ashley, Harper, Arms-Chavez, & LoBello, 2016) and up to 16% of expectant fathers (Paulson & Bazemore, 2010) with even higher rates in low socioeconomic populations (Sareen, Afifi, McMillan, & Asmundson, 2011). Stress and mental health concerns such as depression and anxiety are often elevated during pregnancy, and are linked to later concerns, such as less optimal birth outcomes (Liou, Wang, & Cheng, 2016), postpartum depression (Lee et al., 2007), difficult infant behavior (Vafai, Steinberg, & Shenassa, 2016), and disrupted infant development (Lebel et al., 2015). Environmental risks (e.g., poverty, violence exposure) during the postpartum period may further disrupt a parent's

regulatory capacities, which may place stress on the parent-infant relationship and compromise effective infant care (Dix, 1991). Thus, the ability to soothe an upset baby may be challenged, and the potential for harsh parenting and/or abuse may be increased when the parent experiences increased psychosocial and environmental stress.

There is growing evidence that chronic stress and violence exposure can affect the body and brain both psychologically and physiologically, compromising impulse regulation (Breslau et al., 1995) and expressive speech that is needed to verbally communicate what one is thinking and feeling (van der Kolk, 2006). Stressors that remind an individual of a trauma may stimulate areas of the brain responsible for intense emotions, decrease inhibition of emotions (van der Kolk, 1996) and may activate the autonomic nervous system. Porges, Doussard-Roosevelt, Portales, and Greenspan (1996) propose that when an individual is exposed to environmental stressors, their autonomic nervous system (ANS) reacts by lowering their cardiac vagal tone which promotes increased heart rate to support physiological mobilization to defend against the threat. Once the threat is removed, the vagal tone returns to physiological homeostasis.

Additionally, chronic stress may increase the overall allostatic load of an individual, resulting in a decrease of vagal tone that impairs the cognitive and emotional functioning necessary for parenting (Mills-Koonce et al., 2009). Because the bio-behavioral regulation of the infant is dependent on interactions with the parent, parental dysregulation may compromise sensitive and attuned caretaking. Further, insensitive and harsh parenting is associated with increased cortisol production in young children (Dougherty, Klein, Rose, & Laptook, 2011), thereby influencing stress reactivity in the child via intergenerational transmission processes. Parents who are physiologically and emotionally well-regulated are better able to support, and thereby entrain, the developing bio-behavioral regulatory capacities of their infants, toddlers and young children (Doi,

Kato, Nishitani, & Shinohara, 2011). Parents who have a difficult time regulating emotion while listening to a baby's cry, may be at increased risk for child maltreatment (Crouch, Skowronski, Milner, & Harris, 2008).

Recent research demonstrates that a reduction in stress, as well as the regulation of emotion may lead to healthier, more sensitive parenting (Pereira et al., 2012). Increasing mindfulness may result in improvements in both of these areas. Research into the effects of mindfulness-based interventions in the last few decades have exponentially increased and findings show that an increase of mindfulness is linked to improvements in vagal tone (Azam et al., 2015; Bhatnagar et al., 2013), decreased symptoms of depression (Dimidjian et al., 2015b; Segal, Williams, et al., 2002; Teasdale et al., 2000), anxiety (J. H. Goodman et al., 2014; Roemer, Orsillo, & Salters-Pedneault, 2008), and trauma symptoms (Kelly & Garland, 2016; King, Block, Sripada, Rauch, Porter, et al., 2016; King et al., 2013). Current research also suggests that interventions aimed at improving mindfulness may be helpful in ameliorating symptoms of mental illness (Badker & Misri, 2017; Shi & MacBeth, 2017; Taylor, Cavanagh, & Strauss, 2016) and improving emotion reactivity (Roemer et al., 2015). Mindfulness skills can be taught to expectant parents and may improve relationships between parents and children, ultimately leading to healthier parenting and, therefore, healthier children.

Despite these promising findings, research to date has not examined mindfulness in expectant parents and their physiological reactions to stress. Understanding these relationships is key to the development of early interventions for parents who are exposed to high levels of contextual adversity. The current study aims to further understand physiological stress reactivity (i.e. vagal tone) related to parenting while subjecting parents to the common parenting stressor of soothing a crying baby. Understanding vagal tone patterns in a diverse population of expectant

parents may shed light on differences in physiological reactions that may contribute to the potential for child abuse and if mindfulness alone and with other resiliency factors, such as spirituality and social support may protect against a partial physiological recovery from a stressor. This information can then be disseminated to design specific interventions to promote a more adaptive level of physiological stress response leading to the development of more sensitive parenting practices.

Methods

Procedure

Parents were recruited from obstetrics clinics, social services agencies, and local community establishments using recruitment fliers and through online advertisements on the university website. Interested parents were screened for inclusion and exclusion criteria. Eligible parents were invited to the research laboratory, completed informed consent and were told they were participating in a study on the influence of early experiences on the development of parenting thoughts and behaviors during pregnancy. The visit included qualitative interviews, quantitative questionnaires, and biobehavioral data collection as part of a larger study. Mothers and fathers completed all aspects of the research protocol separately, even though they attended the visit together. They did not complete the protocol in the same sequence and the quantitative questionnaires used in the current analysis took approximately 40 minutes to complete. As one parent completed the biobehavioral and qualitative portions of the protocol, the other parent completed a battery of self-report questionnaires and vice versa. Parents also engaged in a series videotaped interactions and laboratory tasks. Throughout these observations, parents were connected to electrodes to assess respiratory sinus arrhythmia, heart rate, respiration and skin conductance during a simulated parenting stressor. The current study reports findings from self-

report questionnaires described below and a measure of physiological reactivity during a laboratory parenting stressor (baby crying). Parents were provided monetary compensation for their participation. The research protocol was approved by the university's institutional review board (IRB).

Sample Characteristics. Participants for this study were drawn from a larger longitudinal study (*N*=102) examining the influence of bio-psycho-social-spiritual factors on early parenting processes in pregnancy. See Dayton, Matthews, Hicks & Malone (2017) for a detailed description of sample characteristics. Inclusion criteria were adult status, English fluency, a medically uncomplicated singleton pregnancy, and the participation of both biological parents; however, parents were not required to be in a sustained romantic relationship with each other. The most frequently reported ethnicity was African American (58.8%), followed by Caucasian (27.5%). 47.8% had no other children. The sample was considered largely at-risk due to high rates of poverty (48.4% under the poverty line) and exposure to community violence. 27.2% of participants reported that they had been arrested before (9.8% female, 46% male).

Table 1

Demographics (N=102)

Variable	Overall (%)	Women (%)	Men (%)
Race / Ethnicity			
African American	58.8	58.8	58.8
Caucasian	27.5	29.4	25.5
Biracial	6.9	5.9	7.8
Asian-Pacific	3.9	3.9	3.9
Other	2.0	2.0	3.9
Age			
18-25	47.1	49.0	45.1
26-30	18.6	17.7	19.6
31-40	31.4	31.3	31.3

40-48	2.9	2.0	4.0
No. of Children			
0	47.8	54.2	40.9
1	31.5	20.8	43.2
2 or more	20.7	25.1	15.9
Resident Status			
Living Apart from baby's other parent	73.2		
Marital Status			
Married	38.2		
In relationship with baby's other parent	91.2		
Divorced	0.0		
Under Federal Poverty Line	48.4	45.8	51.1
Education Completed			
Some High School	11.8	9.8	7.8
High School/GED	19.6	11.8	27.4
Some College	35.3	39.2	31.4
College/Trade School	23.5	26.5	27.5
Graduate School	9.8	13.7	5.9
Employment			
Unemployed	41.2	49.0	33.3
Part Time	15.7	21.6	9.8
Full Time	43.1	29.4	56.9
Have Been Arrested	27.2	9.8	46.0

Measures

Demographics. Demographic information was collected from each participant and included factors such as age, race, gender, income level, and education.

Dispositional Mindfulness. The five facets of mindfulness scale (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) is a 39-item self-report measure based on a factor analytic study of five independently developed mindfulness questionnaires. Analysis of these five mindfulness questionnaires yielded five factors that capture core aspects of mindfulness: 1) observing; 2) describing; 3) acting with awareness; 4) non-judging of inner experience; and 5) non-reacting to inner experience. Items are rated on a 5-point Likert scale ranging from: 1 (never or very rarely true) to 5 (very often or always true). The scales may be combined for an overall level of dispositional mindfulness with a sum score ranging from 39 to 195. Prior work has

established that the subscales demonstrate good internal consistency ranging from .75 (Non-reactivity) to .91 (Describing; Baer et al., 2006) . The Cronbach's alpha for the full scale for this study was .84.

Social Support. The Multidimensional Perceived Social Support Scale (MPSS; Zimet, 1988) is a 12-item self-report questionnaire focused on the assessment of the amount of perceived social support an individual receives from family, friends, and significant others. Addressing the subjective assessment of social support has empirical backing, as Zimet et al. (1988) report that perceived social support is a more robust predictor of psychological status than social support measured in an objective manner (p. 32). The items are scored on a 7-point Likert-scale, ranging from 1 (very strongly disagree) to 7 (very strongly agree). The scale yields an overall level of perceived support in addition to three subscales that capture support from 1) significant others, 2) family members and 3) friends. The Significant Other subscale items include items such as: "there is a special person with whom I can share joys and sorrows" and "there is a special person in my life who cares about my feelings." The Family Subscale items include: "my family really tries to help me" and "my family is willing to help me make decisions." Included in the Friends Subscale items are: "I can count on my friends when things go wrong" and "I can talk about my problems with my friends." Zimet et al. (1988) established Cronbach's alpha for the total scale as .88. The Cronbach's alpha for the total scale of the current study is .93.

Spirituality. The Brief Multidimensional Measure of Religiousness/Spirituality (B-MMRS; Fetzer Institute & National Institute on Aging Working Group, 1999) is increasingly used in religion, spirituality, and health research as it measures a range of distinct religious and spiritual domains. The B-MMRS is a 40-item questionnaire related to the 12 domains identified as being key dimensions of religious experiences that connect to physical and mental health outcomes. A

total score can be calculated as well as the subscales of daily spiritual experiences; meaning; values; beliefs; forgiveness; private religious practices; religious/spiritual coping; religious support; religious/spiritual history; commitment; organizational religiousness; and religious preference. Past literature reports high internal consistencies (Cronbach's alpha) ranging from 0.71-0.93. The Cronbach's alpha for total score in the current study was .94.

Physiological Indicators of Stress. Physiological data were collected using MindWare 3000A Wireless System (*MindWare Technologies*, Columbus, OH). We captured each parent's physiological reaction to a stressful parenting protocol. Disposable electrocardiogram (ECG) electrodes were placed over the participants' right clavicle and the left side below the ribcage (the recording electrodes), and on the right side below the ribcage (the grounding electrode). A respiratory belt was placed below the diaphragm to monitor and control for respiration throughout the session. All leads were taped to participant's skin to reduce movement artifacts. Electrodes were connected to handheld, wireless ambulatory monitors and were clipped to the expectant parent's belt or pants. The monitors were wirelessly connected to a desktop computer in the adjacent observation room that was not visible to the participant. Quantitative information that is collected through the *MindWare* system include measures that are considered a proxy for autonomic nervous system activation (vagal tone), such as high frequency heart rate variability (root mean square of the successive differences; RMSSD).

Infant Cry Stimuli. Parents' continuous physiological reactions were monitored to assess reaction to infant stimuli using a lifelike, programmable baby doll. We used a *RealCare Baby II-Plus* (RealityWorks, Eau Claire, WI) and programmed the life-like baby doll using a pre-set frequent-cry schedule. The sounds the doll makes are recorded from real babies and include mostly sounds of crying, but occasionally there are sounds of coos or moans. The cry schedule used in

this procedure starts with some mild moaning that is strengthened and elevates to a high intensity cry within the first minute. Over the entire baby cry protocol, the crying changes gradually between high and low intensity with only a few small breaks. The doll's weight was approximately 6.5 lbs., its skin tone was medium-brown, and it was dressed in gender-neutral clothing that covered the plastic of the doll to aid in the illusion of holding a real baby. The doll was placed in a bassinet and parents were instructed by a research assistant to respond, "as if it were your own baby". The parent was then present in the room, alone with the baby doll, through baseline (1 minute), baby crying (10 minutes) and recovery (2 minutes).

Analytic Plan

All data were edited for artifacts due to participant movement by two independent and trained coders using *MindWare* software. The high-frequency heart rate variability was collected and measured as RMSSD. This measures the variability of heart rate from beat-to-beat and can indicate autonomic nervous system arousal. RMSSD magnitude was calculated as the natural logarithm of the variance of heart period within the frequency bandpass related to respiration (0.12-0.40) using a software package (Biolab 2.5; *MindWare Technologies*, Columbus, OH). The data were grouped into 30-second intervals and then averaged for each epoch to create a baseline, baby cry and recovery RMSSD score. The first three minutes of the baby cry were used for analysis since this is when the largest stress response typically occurs.

Change scores (deltas) for RMSSD were computed between baseline to stressor (reactivity) and between stressor to post-stress recovery (physiological recovery). RMSSD recovery was calculated by subtracting the mean post-stress value from the mean baseline; negative or zero value indicates a complete recovery, while a positive value indicated a partial recovery. Each

independent variable was summed together to form an overall resiliency composite variable. The independent variables were then split by the median to form high and low groups.

The following statistical analyses were performed in SPSS version 24 (IBM Corp., 2016). (1) To determine if the stressor successfully elicited subjective and physiological responses, a repeated measures t-test was used to test whether there were differences between mean RMSSD values at baseline, during stressor and during recovery. (2) Between-group differences (high vs. low social support, high vs. low spirituality, high vs. low mindfulness and a composite of the three) on physiological reactivity (change scores for RMSSD) to the stressor and physiological recovery were tested using independent t-tests. *Levene's* test was used to assess for homogeneity of variance. (3) To determine between group differences on physiology over time, a 2 x 3 repeated measures ANOVA was conducted with dichotomized social support, spirituality, mindfulness, and a composite score.

Results

Physiological response to stress. The means and standard deviations of the physiological values (RMSSD) at baseline, baby cry, and recovery are presented in Table 10. Square root transformation was utilized for t-tests to normalize data for social support total score and RMSSD scores. RMSSD at baseline was higher in the pregnant women, likely due to a natural increase in heart rate when pregnant. Using a change score for RMSSD attempts to remove the gender difference issue due to pregnancy, and therefore men and women were pooled together for analysis.

Paired t-tests showed that RMSSD significantly increased from baseline to stressor, $t(69)=4.35$, $p < .001$, and significantly decreased from stressor to recovery, $t(68)=-7.09$, $p < .001$. These results suggest that the stressor did induce a physiological response. Further, there was not

a significant difference from baseline to recovery values, signifying that overall the sample was able to physiologically recover from the stressor, $t(68)=-1.25$, $p=.22$. However, only 58% of the sample exhibited a complete recovery from the stressor.

Table 10

Descriptives of Mindfulness, Spirituality, and Social Support on Stress Response

Variable	Mean (SD)		
	Overall	Women	Men
Mindfulness Total	135.14 (17.92)	139.05 (15.70)	131.14 (19.32)
Social Support Total	67.02 (15.07)	65.10 (16.55)	68.90 (13.37)
Spirituality Total	92.93 (24.35)	91.28 (24.40)	94.58 (24.44)
Resiliency Total	295.69 (32.30)	295.91 (34.38)	295.46 (30.39)
RMSSD baseline	38.50 (28.58)	48.32 (33.45)	27.49 (16.33)
RMSSD baby cry	29.97 (23.29)	37.22 (24.79)	21.84 (18.67)
RMSSD recovery	41.75 (30.39)	51.10 (32.83)	30.94 (23.46)
Reactivity (baby cry – baseline)	-8.53 (19.33)	-11.09 (22.67)	-5.65 (14.55)
Recovery (recovery – baby cry)	11.43 (15.46)	13.88 (15.90)	8.60 (14.68)
RMSSD Baseline to Recovery	2.80 (19.02)	2.78 (23.31)	2.81 (12.74)

Note: Resiliency total is a composite score of mindfulness, social support and spirituality; RMSSD = Root Mean Square of the Successive Difference (measure of heart rate variability); Reactivity = RMSSD baby cry – RMSSD baseline; Recovery = RMSSD recovery – RMSSD baby cry, RMSSD Baseline to Recovery = RMSSD recovery – RMSSD baseline.

Physiological function in high and low resiliency groups. Independent t-tests revealed no significant differences between groups. However, the composite resiliency total score approached significance, $t(60)=1.86$, $p=.067$ with the high resiliency group exhibiting lower RMSSD baseline values. A similar non-significant finding was identified for spirituality with low spirituality groups exhibiting lower stress reaction during the baby cry, $t(63)=1.77$, $p=.08$. Independent *t*-tests revealed that there were no significant between-group differences for high

versus low resiliency, social support or mindfulness and reactivity between stressor and baseline, recovery and stressor, as well as baseline to recovery.

Physiology baby cry stressor in low and high resiliency groups. A 2 x 3 split plot ANOVA was used to determine if there was a change in reactivity across the baby cry stress protocol. No significant main effect for resiliency, social support, spirituality or mindfulness was found either at each individual phase of the stress protocol, or with reactivity between phases.

Discussion

This study aimed to identify potential resiliency factors that may significantly influence expectant parents' physiological stress reaction to a common parenting stressor (a baby cry). A statistically significant stress reaction was observed from baseline through the baby cry stress protocol as hypothesized. The majority of parents recovered from this stress following the termination of the baby cry stimulus, however 42% of expectant parents only achieved a partial recovery.

Contrary to our hypothesis, we did not detect a significant relationship between high and low resiliency groups in terms of their physiological stress response to the baby cry. We expected that parents with higher levels of resiliency (e.g., social support, spirituality, etc.) would experience a less pronounced sympathetic activation in response to the parenting stress. The results were contrary to our hypothesis and surprising. It may be that the protocol felt contrived to parents such that the motivation to soothe the baby doll wasn't present and therefore did not elicit the same reaction that may happen with the participant's own child. Furthermore, there may be a difference in how first-time parents perceive the cry, perhaps parents' physiological reaction changes after parenting their baby.

Previous research demonstrates that higher levels of mindfulness are associated with faster recovery from a stressful event (Kadziolka et al., 2015). However, Kadzioloka et al. (2015) found this to only be the case when examining a specific individual subscale of mindfulness (i.e., observing), suggesting that individuals who were able to observe their own experience were more likely to recover completely from the stressor. It may be that individuals who can utilize skills of mindfulness during a stressor may be able to calm their nervous system and recover from the stressor more completely instead of experiencing residual stress that may lead to an increased cumulative stress load. Additionally, parents who score higher on specific mindfulness subscales may also have significantly different patterns of stress response in the first place, making it easier to recover from the stressor.

Previous research has found that individuals who have higher levels of resiliency also exhibit a stronger recovery from a stress protocol (Lü et al., 2016), however there are some major differences when comparing this to the current study. The current study engages a group of diverse adults exposed to adversity, whereas the aforementioned study includes a fairly homogeneous, college student population. The current study employs a parenting stressor (baby cry) that may elicit more significant physiological stress than the public speaking stressor used by Lu and colleagues (2016). Specifically, a baby's cry is designed to alert the attention of his or her caregivers, and under normal circumstances, we would expect a caregiver to experience a stress response and to attend to the needs of the baby. However, long periods of crying may add to a parent's frustration and their stress reaction may increase. Additionally, a parent's own history with their parents or caregivers may also influence his or her reactivity to hearing a baby cry. For example, in their seminal infant mental health paper, *Ghosts in the Nursery*, Fraiberg, Adelson, and Shapiro (1975) discuss how the experience of parenting a young child may provoke a strong

psychological response as unconscious emotions resurface from the parent's own childhood. Perhaps in the current study, the act of attempting to soothe a crying baby caused significant dysregulation in the parent due to their early childhood experiences which would then make it increasingly difficult to dissipate the physiological stress reaction even after the stressor is over. It may also be that just having a disposition of mindfulness may not be enough to improve an individual's stress recovery. It may be that active engagement of mindfulness-type practices while under stress (i.e., state mindfulness) is required to elicit a significant nervous system response. As an accumulation of stress creates a toxic load, perhaps a cumulative resilience is also necessary to mitigate the effects of toxic stress.

Further research is necessary to investigate the different reactions to stress in parents who experienced childhood trauma versus those who did not. Furthermore, it may be fruitful to examine individual mindfulness subscales in the context of parenting as much research posits that introspection in the form of mentalization and reflective functioning also correspond to sensitive parenting (Stacks et al., 2014).

Conclusion

In summary, the present study suggests that parents from diverse populations exposed to adversity may have difficulty regulating stress after a stressful situation in spite of social support, spirituality and mindfulness. It appears that dispositional mindfulness may have a small effect on the ability to recover from stress, however larger samples are needed to confirm this. Although these findings are non-significant, studies that employ more robust statistics and larger sample sizes may yield significant findings. It could be that the combination of factors studied are not significant together and that a different measure of resiliency would result in positive results. In addition, it may be useful to perform qualitative interviews with a similar sample to understand

how expectant mothers and fathers react to stress and what skills they find most useful and then test common coping techniques with a similar stress protocol.

Plans for Further Analyses

This is the first time a study has examined mindfulness and physiological stress response in a sample of expectant parents. The descriptive information of stress response in these parents is an important contribution which will add to future understanding of patterns of reactivity in a high-risk population. A limitation of this study is that it is underpowered for the 2x3 ANOVA. In dichotomizing the independent variables, the variability within the data was diminished which may be a contributor to the non-significant findings. Potential future directions for analysis include using a Latent Class Growth Analysis which will allow for more participants to be included and for independent variables to remain continuous. Furthermore, increasing the sample size of future studies will increase the statistical power and may provide more clear and significant findings.

CHAPTER 5 CONCLUSION AND RECOMMENDATIONS FOR TRAUMA-INFORMED ADAPTATIONS TO MINDFULNESS INTERVENTIONS

This three-part dissertation explores risk and resiliency factors in a sample of expectant mothers and fathers considered at risk for the development of harsh and abusive parenting due to exposure to violence and poverty. Findings from this dissertation demonstrate the potential of mindfulness as a protective factor for vulnerable parents; in the current study mindfulness was associated with higher levels of positive parental mental health and lower risk for abusive parenting. In chapter 2, dispositional mindfulness was explored in relation to trauma and depressive symptomology. In chapter 3, dispositional mindfulness was examined as a protective factor lessening the influence of trauma symptoms on child abuse potential in expectant mothers and fathers. Finally, in chapter 4, the influence of mindfulness, spirituality and social support on physiological stress reactivity in response to a parenting stress protocol was examined. These three studies contribute to the growing body of literature on mindfulness and extend prior work by examining trait-level mindfulness capacities in a high-risk sample of expectant mothers and fathers.

Taken together, the findings presented in chapters 2, 3, and 4 provide an encouraging direction for improving wellness in risk-exposed expectant parents. Specifically, findings from chapters 2 and 3 revealed that higher levels of mindfulness were associated with lower levels of trauma and depressive symptoms and lower scores on a measure of child abuse potential. Finally, in chapter 4, physiological stress response was examined in parents who exhibited low and high resiliency and, although the main effect analyses were not significant, findings demonstrated that some parents were able to recover from the stressor more completely than others, suggesting individual differences in the capacity to recover after exposure to a parenting stress.

Taken together, these findings show that dispositional mindfulness is an important factor associated with positive outcomes in expectant parents. Previous research has indicated that mindfulness may be an important characteristic for wellbeing in people transitioning through parenthood (Beattie, Hall, Biro, Lau, & East, 2014; Braeken, Jones, Otte, Nyklíček, & Van den Bergh, 2016; Dhillon, Sparkes, & Duarte, 2017; Felder et al., 2017; Hall, Beattie, Lau, East, & Anne Biro, 2015) Although the above studies are cross-sectional, the strong associations of mindfulness with psychopathology and risk for abuse, along with previous research findings, create a case for further research attention. It is possible, for example, that improving mindfulness via early interventions may help to alleviate symptoms of psychopathology and risk in vulnerable groups of parents.

Two interesting findings emerged from the first two studies. First, congruent with other research, there is a high comorbidity of trauma symptoms with depressive symptoms and potential risk for child abuse in this sample. Surprisingly, even though this comorbidity has been previously documented, very few mindfulness-based interventions for depression or vulnerable groups are trauma-informed. Secondly, the measure of mindfulness used has not been validated with Black / African American individuals. Therefore, it is currently unknown if measuring mindfulness in individuals other than Caucasians with this scale is methodologically valid. Additional research is needed to ensure mindfulness-based interventions are culturally competent. Previous qualitative research has begun to identify some cultural adaptations, but no studies investigate this in highly, risk-exposed, Black / African-Americans. To fill this gap, there is a need for the development of culturally-competent measures of mindfulness that can be used reliably across culturally diverse groups of parents.

This chapter will discuss the implications of the current findings for mindfulness interventions that aim to improve the wellbeing of expectant parents and their infants. The following main points from the findings will be discussed: (1) mindfulness as a protective factor, (2) the need for trauma-informed mindfulness interventions for risk-exposed, expectant parents, and (3) culturally-competent mindfulness interventions and measurement tools.

Mindfulness as a Protective Factor

Pregnancy proves to be an opportune time for intervention as parents are often willing to make important life changes in order to improve the lives of their babies. The effects of improving health in pregnancy may not only affect the parent, but may affect the neurobiology of the fetus (E. P. Davis et al., 2011) as well as the child's development over the life-course (Bosquet Enlow et al., 2017; Branjerdporn, Meredith, Strong, & Garcia, 2016; E. P. Davis & Sandman, 2010; DiPietro et al., 2006). Many parents are resilient to the stressors in their lives, even when faced with great adversity. Research identifies several protective factors for parents against psychopathology and child maltreatment including; social support, concrete assistance, socioemotional competence and healthy relationships (Child Welfare Information Gateway, 2013; Jallo et al., 2015). This study's findings add to the existing research by showing that mindfulness may be an important protective factor against many of the hardships of life. Improving mindfulness is known to improve overall socioemotional competence (Quaglia, Goodman, & Brown, 2015), stress (Donald, Atkins, Parker, Christie, & Ryan, 2016), depression (Segal et al., 2013), anxiety (Roemer et al., 2008), PTSD (King, Block, Sripada, Rauch, Porter, et al., 2016), and healthy adult attachment (T. J. Davis, Morris, & Drake, 2016). An additional promising characteristic of mindfulness is that it can be taught, and it can therefore change in an individual. The potential for mindfulness interventions to be disseminated to vulnerable populations is great, and has already

begun, however, this study illustrates important areas for consideration in intervention designs for risk-exposed parents.

Trauma Informed Care in Mindfulness Practice

Consistent with prior work, the current findings demonstrated high rates of comorbid trauma symptoms in parents reporting depression (Oh et al., 2016; Silverstein et al., 2010). Many mindfulness interventions are designed specifically to treat depression in adults, such as MBCT (Segal, Williams, et al., 2002). However, to date, very few mindfulness-based interventions include specific trauma-sensitive adaptations even when working with trauma-exposed populations. The trauma-informed adaptations that have been developed are reviewed here.

Trauma-sensitive accommodations integrated into mindfulness practice often involve specific language-use of the teacher. For example, teachers are urged to provide choice and alternatives to participants during meditative exercises so that participants feel in control of their own healing (Emerson et al., 2009; Kimbrough, Magyari, Langenberg, Chesney, & Berman, 2010; King et al., 2013). In addition, tailoring the psychoeducation portion of the intervention to specifically address trauma symptoms in addition to addressing comorbid depressive symptoms is warranted (Kelly & Garland, 2016; King, Block, Sripada, Rauch, Giardino, et al., 2016; King et al., 2013). Unfortunately, many mindfulness interventions do not include any adaptations to the yoga practice portion of the intervention for trauma-exposed populations. In an important exception, Emerson et al. (2009) have recently provided practical suggestions for creating a safe environment in yoga such as covering windows, ensuring no one else will suddenly enter the room, and providing dim lighting (but not too dark). The goal of these adaptations is to provide trauma survivors with a way to explore what is going on in their body and in their thoughts in a compassionate, open, accepting way. An example of a trauma-informed adaptation to yoga

practice involves the final posture, *savasana*, where one typically lies on the floor with their legs and arms splayed open and their eyes closed. In a trauma-sensitive yoga class, one may be given the option to choose a different resting posture and provided the opportunity to open their eyes in order to experience a feeling of safety. Additional adaptations suggested by Magyari (2014) include shorter practices or shorter periods of silence between guided instructions in order to build mastery and confidence. Further, when working with groups who have experienced trauma, smaller group sizes are suggested (6-8 people vs. 20-30 people in MBSR and 10-12 people in MBCT). Finally, due to the increased time that may be needed to process the meditation practices, the groups are extended to 10 weeks instead of eight.

Many of these trauma-informed practices can be taught rather quickly to mindfulness teachers. A basic understanding of trauma responses and trauma informed care should be included in mindfulness teacher trainings, especially if the teacher will offer these practices in a vulnerable setting. Additionally, it is important to consider that trauma is experienced across race, gender, culture and class, and therefore it would behoove teachers to employ trauma-informed care no matter the setting. As mindfulness interventions continue to grow in popularity and begin to be disseminated into more and more vulnerable populations, the research needs to evolve to include best practices for culturally competent, trauma-informed interventions. Although mindfulness practices such as yoga and meditation have been shown to be effective for a wide range of challenges, and often there are no reported adverse effects, this does not mean that professionals should not strive to improve an already effective program. Becoming trauma-informed may require the entire structure of the organizations that develop and facilitate mindfulness trainings to reflect on the ways that their entire structure can be a trauma-sensitive one. This may require a portion of trainings to include a section on trauma-informed care and additionally caution teachers, trainers

and administrators who are not trained in trauma symptoms and treatment to gain additional training prior to serving vulnerable populations. As more awareness of the importance and prevalence of trauma in our society is embraced by the structures, organizations, teachers and practitioners, the practice may become inherently trauma-informed for all populations.

Cultural Competence in Mindfulness Research and Practice

An important finding in chapter 2 was the identification of a significant difference in the mindfulness levels of mothers and fathers. Although we do not fully understand the reason for this difference, it does bring into question the issue of how mindfulness may be understood differently across gender, race and culture. Perhaps this difference is truly a gender difference, and the questions asked are not conceptualized in the same way by men and women, especially considering the diverse nature of our sample. Further, since the majority of mindfulness studies conducted to date include Caucasian, middle-class participants and, the findings as well as the measurement tools may not necessarily be generalizable across diverse cultural groups. Some research has explored the feasibility and acceptability of mindfulness specifically in African-American populations (S. H. Goodman, Dimidjian, & Williams, 2013) with findings suggesting an openness and desire for such practices. In a study informing this work, Woods-Giscombé & Gaylord (2014) provided a mindfulness-based intervention to a group of 15 African-American women. Upon interview, these women offered some suggestions for implementation adaptations for dissemination to other African-Americans. Many drew parallels between meditation and prayer, although some noted that prayer is often not present-focused in the way that mindfulness meditation is. One participant likened the mindfulness group to other groups in her culture that strengthen the group as a whole and offer opportunities for social support (Woods-Giscombé & Gaylord, 2014).

In contrast to these findings, other research has identified challenges when translating mindfulness meditation practices across cultures. Watson, Black, and Hunter (2016), for example, reported that African-American women had perceptions that meditation was not culturally relevant to them because they viewed it as a religious practice in conflict with their own beliefs. Garland (2013) argues that mindfulness-based interventions may take on different meaning when utilized with individuals who are oppressed, living in poverty, or exposed to high levels of violence in their communities. He recommends that mindfulness training manuals utilize accessible language instead of academic or dogmatic verbiage (Garland, 2013).

Conclusion

In summary, these studies are the first to examine dispositional mindfulness in a sample of risk-exposed expectant mothers and fathers. Mindfulness is observed to be a significant factor with depressive symptoms and potential risk for child abuse, suggesting that mindfulness may be a protective factor against risk in this population Additionally, nearly half of our sample did not fully recover physiologically from a typical parenting stressor indicating some parent's may experience stress differently than others. Although resiliency was not significant, it did trend towards significance, suggesting that resiliency factors may contribute to a healthier stress response for some parents. Furthermore, due to the lack of culturally-informed measurements and interventions as well as the strong contribution of trauma symptoms to depressive symptoms and potential risk of child abuse, there is a need for specific trauma-informed mindfulness-interventions when translating these findings into clinical practice.

APPENDIX A EDINBURGH POSTPARTUM DEPRESSION SCALE

We would like to know how you are feeling. Please mark the answer that comes closest to how you have felt **IN THE PAST 7 DAYS,** not just how you feel today.

Here is an example, already completed. I have felt happy: O No, not at all O No, not very often ● Yes, most of the time	● Yes, most of the time This would mean: "I have felt happy most of the time" during the past week. Please complete the other questions in the same way.

1. I have been able to laugh and see the funny side of things O As much as I always could O Not quite so much now O Definitely not so much now O Not at all	6. Things have been getting on top of me O Yes, most of the time I haven't been able to cope at all O Yes, sometimes I haven't been coping as well as usual O No most of the time I have coped quite well O No, I have been coping as well as ever
2. I have looked forward with enjoyment to things O As muchas I ever did O Rather less than I used to O Definitely less than I used to O Hardly at all	7. I have been so unhappy that I have had difficulty sleeping O Yes, most of the time O Yes, quite often O Not very often O No not at all
3. I have blamed myself unnecessarily when things went wrong O Yes, most of the time O Yes, some of the time O Not very often O No, never	8. I have felt sad or miserable O Yes, most of the time O Yes, quite often O Not very often O No, not at all
4. I have been anxious or worried for no good reason O No, not at all O Hardly ever O Yes, sometimes O Yes, very often	9. I have been so unhappy that I have been crying O Yes, most of the time O Yes, quite often O Only occasionally O No, never
5. I've felt scared/panicky for no very good reason O Yes, quite a lot O Yes, sometimes O No, not much O No, not at all	10. The thought of harming myself has occurred to me O Yes, quite often O Sometimes O Hardly ever O Never

APPENDIX B TRAUMA SYMPTOMS CHECKLIST

How often have you experienced these symptoms in the past 2 months?				
	Never			**Often**
1. Headaches	0	1	2	3
2. Insomnia (trouble getting to sleep)	0	1	2	3
3. Weight loss (without dieting)	0	1	2	3
4. Stomach problems	0	1	2	3
5. Sexual problems	0	1	2	3
6. Feeling isolated from others	0	1	2	3
7. "Flashbacks" (sudden, vivid, distracting memories)	0	1	2	3
8. Restless sleep	0	1	2	3
9. Low sex drive	0	1	2	3
10. Anxiety attacks	0	1	2	3
11. Sexual over activity	0	1	2	3
12. Loneliness	0	1	2	3
13. Nightmares	0	1	2	3
14. "Spacing out" (going away in your mind)	0	1	2	3
15. Sadness	0	1	2	3
16. Dizziness	0	1	2	3
17. Not feeling satisfied with your sex life	0	1	2	3
18. Trouble controlling your temper	0	1	2	3
19. Waking up early in morning and can't get back to sleep	0	1	2	3
20. Uncontrollable crying	0	1	2	3
21. Fear of men	0	1	2	3
22. Not feeling rested in the morning	0	1	2	3
23. Having sex that you didn't enjoy	0	1	2	3
24. Trouble getting along with others	0	1	2	3
25. Memory problems	0	1	2	3
26. Desire to physically hurt yourself	0	1	2	3
27. Fear of women	0	1	2	3
28. Waking up in the middle of the night	0	1	2	3
29. Bad thoughts or feelings during sex	0	1	2	3
30. Passing out	0	1	2	3
31. Feeling that things are "unreal"	0	1	2	3
32. Unnecessary or over-frequent washing	0	1	2	3
33. Feelings of inferiority	0	1	2	3
34. Feeling tense all the time	0	1	2	3
35. Being confused about your sexual feelings	0	1	2	3
36. Desire to physically hurt others	0	1	2	3
37. Feelings of guilt	0	1	2	3
38. Feelings that you are not always in your body	0	1	2	3
39. Having trouble breathing	0	1	2	3
40. Sexual feelings when you shouldn't have them	0	1	2	3

APPENDIX C CHILDHOOD TRAUMA QUESTIONAIRE

When I was growing up (before the age of 18) ...

	Never True	Rarely True	Sometimes True	Often True	Always True
1. I didn't have enough to eat	1	2	3	4	5
2. I knew that there was someone to take care of me and protect me.	1	2	3	4	5
3. People in my family called me things like "stupid," "lazy," or "ugly."	1	2	3	4	5
4. My parents were too drunk or high to take care of the family.	1	2	3	4	5
5. There was someone in my family who helped me feel that I was important or special.	1	2	3	4	5
6. I had to wear dirty clothes.	1	2	3	4	5
7. I felt loved.	1	2	3	4	5
8. I thought that my parents wished I had never been born.	1	2	3	4	5
9. I got hit so hard by someone in my family that I had to see a doctor or go to the hospital.	1	2	3	4	5
10. There was nothing I wanted to change about my family.	1	2	3	4	5
11. People in my family hit me so hard that it left me with bruises or marks.	1	2	3	4	5
12. I was punished with a belt, a board, a cord or some other hard object.	1	2	3	4	5
13. People in my family looked out for each other.	1	2	3	4	5
14. People in my family said hurtful or insulting things to me.	1	2	3	4	5
15. I believe that I was physically abused.	1	2	3	4	5
16. I had the perfect childhood.	1	2	3	4	5
17. I got hit or beaten so badly that it was noticed by someone like a teacher, neighbor or doctor.	1	2	3	4	5
18. I felt that someone in my family hated me.	1	2	3	4	5

	Never True	Rarely True	Sometimes True	Often True	Always True
19. People in my family felt close to each other.	1	2	3	4	5
20. Someone in my family tried to touch me in a sexual way, or tried to make me touch them.	1	2	3	4	5
21. Someone threatened to hurt me or tell lies about me unless I did something sexual with them.	1	2	3	4	5
22. I had the best family in the world.	1	2	3	4	5
23. Someone tried to make me do sexual things or watch sexual things.	1	2	3	4	5
24. Someone molested me.	1	2	3	4	5
25. I believe that I was emotionally abused.	1	2	3	4	5
26. There was someone to take me to the doctor if I needed it.	1	2	3	4	5
27. I believe that I was sexually abused.	1	2	3	4	5
28. My family was a source of strength and support.	1	2	3	4	5

APPENDIX D FIVE FACETS OF MINDFULNESS

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
never or very rarely true	**rarely true**	**sometimes true**	**often true**	**very often or always true**

_____ 1. When I'm walking, I deliberately notice the sensations of my body moving.

_____ 2. I'm good at finding words to describe my feelings.

_____ 3. I criticize myself for having irrational or inappropriate emotions.

_____ 4. I perceive my feelings and emotions without having to react to them.

_____ 5. When I do things, my mind wanders off and I'm easily distracted.

_____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.

_____ 7. I can easily put my beliefs, opinions, and expectations into words.

_____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.

_____ 9. I watch my feelings without getting lost in them.

_____ 10. I tell myself I shouldn't be feeling the way I'm feeling.

_____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.

_____ 12. It's hard for me to find the words to describe what I'm thinking.

_____ 13. I am easily distracted.

_____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.

_____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.

_____ 16. I have trouble thinking of the right words to express how I feel about things

_____ 17. I make judgments about whether my thoughts are good or bad.

_____ 18. I find it difficult to stay focused on what's happening in the present.

_____ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.

_____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.

_____ 21. In difficult situations, I can pause without immediately reacting.

_____ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.

PLEASE TURN OVER ÷

1	2	3	4	5
never or very rarely true	**rarely true**	**sometimes true**	**often true**	**very often or always true**

_____ 23. It seems I am "running on automatic" without much awareness of what I'm doing.

_____24. When I have distressing thoughts or images, I feel calm soon after.

_____ 25. I tell myself that I shouldn't be thinking the way I'm thinking.

_____ 26. I notice the smells and aromas of things.

_____ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.

_____ 28. I rush through activities without being really attentive to them.

_____ 29. When I have distressing thoughts or images I am able just to notice them without reacting.

_____ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.

_____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.

_____ 32. My natural tendency is to put my experiences into words.

_____ 33. When I have distressing thoughts or images, I just notice them and let them go.

_____ 34. I do jobs or tasks automatically without being aware of what I'm doing.

_____ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.

_____ 36. I pay attention to how my emotions affect my thoughts and behavior.

_____ 37. I can usually describe how I feel at the moment in considerable detail.

_____ 38. I find myself doing things without paying attention.

_____ 39. I disapprove of myself when I have irrational ideas.

APPENDIX E BRIEF POTENTIAL OF CHILD ABUSE INVENTORY

Please read each statement and circle AGREE or DISAGREE as it applies to you:

	Agree	Disagree
1. I am a happy person	1	2
2. I know what is the right and wrong way to act.	1	2
3. People have caused me a lot of pain.	1	2
4. I sometimes act without thinking.	1	2
5. I am often lonely inside.	1	2
6. My family fights a lot.	1	2
7. Everything in a home should always be in its place.	1	2
8. I often feel very upset.	1	2
9. Sometimes I have bad thoughts.	1	2
10. I sometimes worry that I will not have enough to eat.	1	2
11. I am easily upset by my problems.	1	2
12. Sometimes I feel all alone in the world.	1	2
13. My family has problems getting along.	1	2
14. Children should never disobey.	1	2
15. I sometimes lose my temper.	1	2
16. I often feel worthless.	1	2
17. My family has many problems.	1	2
18. It is ok to let a child stay in dirty diapers for a while.	1	2
19. I am often upset and do not know why.	1	2
20. Children should be quiet and listen.	1	2
21. I sometimes fail to keep all of my promises.	1	2
22. I often feel very alone.	1	2
23. My life is good.	1	2
24. I am often upset.	1	2
25. Other people have made my life unhappy.	1	2
26. I sometimes say bad words.	1	2
27. I am often depressed.	1	2
28. Children should not learn how to swim.	1	2
29. My life is happy.	1	2

	Agree	Disagree
30. I sometimes worry that my needs will not be met.	1	2
31. I often feel alone.	1	2
32. A child needs very strict rules.	1	2
33. Other people have made my life hard.	1	2
34. People sometimes take advantage of me.	1	2

APPENDIX F THE MULTIDIMENSIONAL PERCEIVED SOCIAL SUPPORT SCALE

Instructions: We are interested in how you feel about the following statements. Read each statement fully.

HOW MUCH DO YOU AGREE WITH AND FEEL THE FOLLOWING STATEMENTS ARE TRUE?

	Very Strongly Disagree	Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree	Very Strongly Agree
1. There is a special person who is around when I am in need.	1	2	3	4	5	6	7
2. There is a special person with whom I can share my joys and sorrows.	1	2	3	4	5	6	7
3. My family really tries to help me.	1	2	3	4	5	6	7
4. I get the emotional help and support I need from my family.	1	2	3	4	5	6	7
5. I have a special person who is a real source of comfort to me.	1	2	3	4	5	6	7
6. My friends really try to help me.	1	2	3	4	5	6	7
7. I can count on my friends when things go wrong.	1	2	3	4	5	6	7
8. I can talk about my problems with my family.	1	2	3	4	5	6	7
9. I have friends with whom I can share my joys and sorrows.	1	2	3	4	5	6	7
10. There is a special person in my life that cares about my feelings.	1	2	3	4	5	6	7
11. My family is willing to help me make decisions.	1	2	3	4	5	6	7
12. I can talk about my problems with my friends.	1	2	3	4	5	6	7

APPENDIX G THE BRIEF MULTIDIMENSIONAL MEASURE OF RELIGIOUSNESS/SPIRITUALITY

Religious Preference

1. What is your current religious preference?
    a. Protestant Christian
    b. Roman Catholic
    c. Evangelical Christian
    d. Jewish
    e. Muslim
    f. Hindu
    g. Buddhist
    h. None
    i. Other (please specify): _____

Self-Ranking

1. To what extent do you consider yourself a religious person?
    a. Very Religious
    b. Moderately Religious
    c. Slightly Religious
    d. Not religious at all

2. To what extent do you consider yourself a spiritual person?
    a. Very spiritual
    b. Moderately spiritual
    c. Slightly spiritual
    d. Not spiritual at all

Religious Attendance

1. How often do you go to religious services?
    a. Never
    b. Once or twice per year
    c. Every month or so
    d. Once or twice a month
    e. Every week or more often
    f. More than once a week

Private prayer

1. How often do you pray privately in places other than at church or a synagogue?
    a. Never
    b. Once or twice per year

c. Every month or so
d. Once or twice a month
e. Every week or more often
f. More than once a week

Religious and Spiritual Coping

Think about how you try to understand and deal with major or stressful problems in your life. To what extent is each of the following involved in the way you cope.

1. I think about how my life is part of a larger spiritual force.
    a. A great deal
    b. Quite a bit
    c. Somewhat
    d. Not at all

2. I work together with God as partners
    a. A great deal
    b. Quite a bit
    c. Somewhat
    d. Not at all

3. I look to God for strength, support, and guidance.
    a. A great deal
    b. Quite a bit
    c. Somewhat
    d. Not at all

4. I feel God is punishing me for my sins or lack of spirituality.
    a. A great deal
    b. Quite a bit
    c. Somewhat
    d. Not at all

5. I wonder whether God has abandoned me.
    a. A great deal
    b. Quite a bit
    c. Somewhat
    d. Not at all

6. I try to make sense of the situation and decide what to do without relying on God.
    a. A great deal
    b. Quite a bit
    c. Somewhat
    d. Not at all

7. To what extent is your religion involved in understanding or dealing with stressful situations in any way?

a. A great deal
b. Quite a bit
c. Somewhat
d. Not at all

APPENDIX H WAYNE STATE INSTITUTIONAL REVIEW BOARD APPROVAL

WAYNE STATE UNIVERSITY

IRB Administration Office
87 East Canfield, Second Floor
Detroit, Michigan 48201
Phone: (313) 577-1628
FAX: (313) 993-7122
http://irb.wayne.edu

NOTICE OF EXPEDITED CONTINUATION APPROVAL

To: Carolyn Dayton
Social Work Instruction Un
WSU School of Social Work

From: Dr. Deborah Ellis or designee A-LaCour / 2-2
Chairperson, Behavioral Institutional Review Board (B3)

Date: December 06, 2016

RE:
IRB #: 023413B3F
Protocol Title: Baby on Board! Wayne State University Early Parenting Study
Funding Source: Unit: Social Work Instruction Un
Protocol #: 1302011714

Expiration Date: December 05, 2019

Risk Level / Category: Research not involving greater than minimal risk

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Continuation for the above-referenced protocol and items listed below (if applicable) were APPROVED following Expedited Review by the Chairperson/designee of the Wayne State University Institutional Review Board (B3) for the period of **12/06/2016 through 12/05/2019**. This approval does not replace any departmental or other approvals that may be required.

- Closed to accrual and active intervention completed (Accrual closed 02/01/2015)
- Please note: This continuation was reviewed under the IRB Administration Office Flexible Review and Oversight Policy, therefore the expiration date is December 05, 2019.

- Federal regulations require that all research be reviewed at least annually. You *may* receive a *"Continuation Renewal Reminder"* approximately two months prior to the expiration date; however, it is the Principal Investigator's responsibility to obtain review and continued approval ***before*** the expiration date. Data collected during a period of lapsed approval is unapproved research and can never be reported or published as research data.
- All changes or amendments to the above-referenced protocol require review and approval by the IRB **BEFORE** implementation.
- Adverse Reactions/Unexpected Events (AR/UE) must be submitted on the appropriate form within the timeframe specified in the IRB Administration Office Policy (http://www.irb.wayne.edu//policies-human-research.php).

NOTE:

1. Upon notification of an impending regulatory site visit, hold notification, and/or external audit the IRB Administration Office must be contacted immediately.
2. Forms should be downloaded from the IRB website at **each** use.

*Based on the Expedited Review List, revised November 1998

Notify the IRB of any changes to the funding status of the above-referenced protocol.

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ABSTRACT

PREPARING TO PARENT: RISK AND RESILIENCE IN A SAMPLE OF EXPECTANT PARENTS EXPOSED TO ADVERSITY

by

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Expectant parents who have been exposed to psychosocial risk encounter deleterious psychological (Ashley et al., 2016), and physiological (cite) effects. This not only affects the parent-to-be, but also may affect the developing fetus (cite) and is linked to poorer infant development (cite). However, not all risk-exposed individuals experience this, many are resilient and still thrive in the face of adversity. Understanding potential risk and resiliency factors in expectant parents is advantageous, so tailored interventions can be devised to improve outcomes. One potential resiliency factor, mindfulness, is finding its way into a variety of contexts, however little research has been explored in a sample of diverse, expectant parents who are exposed to risk. In response, this three-paper dissertation examined dispositional mindfulness in women and men expecting a baby (*N*=102). First, the relationship between dispositional mindfulness and depressive symptoms, considering the potential confounding effect of trauma symptoms was explored. Next, mindfulness and trauma were investigated as predictors of potential risk for child abuse. Finally, physiological stress (vagal tone) response to a parenting stressor was studied in low and high resiliency groups. Findings illustrate a significant relationship, in the expected direction,

between total dispositional mindfulness and depressive symptoms as well as potential risk for child abuse. Total dispositional mindfulness and the subscale of non-reactivity predicted depressive symptoms and higher potential risk of child abuse. Trauma symptoms were also predictive of both depressive symptoms and risk of child abuse. Low and high resiliency groups approached significance (p=.06) in differing stress recovery (high frequency heart rate variability) from the common parenting stress of soothing a crying baby. Implications for clinical practice and future research are discussed.

AUTOBIOGRAPHICAL STATEMENT

Laurel Hicks is a fully licensed clinical social worker as well as a yoga and mindfulness teacher. As a practitioner, she provides perinatal mental health services to expectant and postpartum families in the Metro-Detroit area. She is a dual-title doctoral student in social work (clinical concentration) and infant mental health. Laurel was chosen to be a Predoctoral Fellow through the Merrill Palmer Skillman Institute for Lifespan Development and has worked on mixed-methods research involving pregnant and postpartum parents and their babies geared at understanding wellbeing in families through an attachment perspective. Her ongoing research interests include culturally relevant and trauma-informed interventions, specifically mindfulness interventions for the perinatal period, as well as understanding the neurobiological effects of stress during the perinatal period.