

THE IMPACT OF MINDFULNESS-BASED PRENATAL YOGA ON
MATERNAL ATTACHMENT

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CERTIFICATION OF APPROVAL

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DEDICATION

I would like to dedicate this to everyone who helped and supported through this process, I wouldn't have made it through without you.

ACKNOWLEDGEMENTS

I want to thank my friends, family, and fellow classmates, I wouldn't be here today if it was for the support and encouragement you have all given me throughout this program.

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ABSTRACT

Research has shown that attachment plays a very important role in a child's development. A 12-week mindfulness-based prenatal yoga pilot program was evaluated for its effectiveness on mindfulness levels and feelings of attachment throughout pregnancy and during the post-partum period. Fifteen women completed the program. Participant scores were obtained at four time points – baseline, halfway through the program (Time 2), program conclusion (Time 3) and four months after program conclusion (Time 4). Data were collected via the Five Facet Mindfulness Questionnaire to measure feelings of attachment. Participant mindfulness scores increased from baseline to Time 2 (6-weeks into program) and from baseline to Time 3 (program conclusion). Participant attachment scores increased from baseline to the four-month follow-up. The brief and non-invasive nature of this program makes it a possible candidate for increasing feelings of attachment between mother and baby, both pre- and postnatal.

CHAPTER I

INTRODUCTION

Statement of Problem

As a woman prepares for motherhood, an extraordinary period of human growth and development presents itself. Within weeks of conception there is a significant shift in a number of hormones present in a woman's body. This shift synthesizes a remarkable reorganization of the body's physical, biological and emotional levels (Cohen, 2010). According to Alhusan (2008) a woman's capacity to positively adapt to these initial changes is the start of mother-fetal attachment. A study by Siddiqui and Hagglof (2000) found that prenatal attachment towards the unborn baby is a good predictor for the postnatal mother-infant relationship. During the early stages of a child's life it is the mother who is responsible for maintaining a relational attachment to their baby (Ainsworth & Bowlby, 1979). This attachment is built upon the caregiver's ability to appropriately respond to the child's signals both pre- and postnatal, if these needs are not met the foundation for a healthy relationship is absent (Ainsworth, 1969).

According to Dr. Bruce Perry (2006), if a mother neglects to establish a healthy bond with their baby early in life, the child will be unable to construct specific brain systems that connect human-to-human contact with feelings of pleasure. Without positive attachment to primary caregivers, babies not only become emotionally cut off from others but also will continue to be unable to form bonds with

other individuals in which they come into contact (Perry, 2006). Lack of emotional stimulation can also trigger devastating consequences internally, as the child's deregulation of stress-related hormones can impede growth and cause a "failure to thrive" (Perry, 2006).

One factor that poses a serious threat to the formation of an affectionate bond between mother and child is the presence of psychological and/or emotional disturbances, whether it be pre- or postnatal (Ainsworth & Bowlby, 1979). In 2012, Faucher found that the rate of depressive symptoms reported by expectant mothers was between 8% and 11%. Those individuals suffering from depression, pregnant or not, are commonly prescribed selective serotonin reuptake inhibitors (SSRIs), but recent studies have found that if taken during pregnancy SSRIs pose a significant risk for adverse fetal effects (Faucher, 2012). This finding led many soon to be mothers to shy away from pharmacological treatment and seek out alternative methods. One of the approaches increasingly sought out by pregnant women, is the practice of mindfulness techniques such as yoga and meditation (Faucher, 2012).

According to the teachings of Buddha, mindfulness practice such as meditation and deep breathing creates both a spiritual and psychological awareness, eventually leading one to the path of enlightenment (Gard, Brach, Holzel, Noggle, Conboy & Lazar, 2012). Mindfulness-based techniques are commonly integrated into clinical interventions and the treatment of stress-related symptom reduction (i.e. obsessive-compulsive disorder, eating disorders and generalized anxiety) but are less often viewed as beneficial interventions for pregnant women (Beddoe & Lee, 2007).

However, Beddoe and Lee emphasize that incorporating mindfulness meditation and yoga into the daily life during pregnancy can offer potential for stronger feelings of prenatal attachment by allowing one to be present in the moment and focus on becoming completely aware of bodily sensations, which include movements of the fetus (Beddoe & Lee, 2007). Evidence for the benefits of mindful attachment can be seen in a study conducted by Rubin in 1975. Rubin (1975) found that that women who are able to notice the movements and rhythms of their baby, are better able to develop a mental and physical awareness of their developing child.

Bardacke and Duncan (2003) developed a Mindfulness-Based Childbirth and Parenting (MBCP) pilot program hoping to find innovative ways to counteract the unwanted symptoms of pregnancy (i.e. stress, pain, anxiety, etc.), as well as monitor childbirth, the family's attachment to the infant and the child's overall development. Participants in the study were expected to attend a three-hour weekly session that would continue for nine weeks (Bardacke & Duncan, 2013). The MBCP classes integrated yoga, mindful-meditation and group discussions, which aimed to create a community among the participants. The quantitative aspect of the research used the Five Facet Mindfulness Questionnaire (FFMQ), to assess whether the daily practice of mindful awareness helped to increase the participant's ability to feel a deeper attachment to their growing baby (Bardacke & Duncan, 2013). The results of the study showed that 74% of the women who participated in the MBCP program reported continued use of the mindfulness techniques through the remainder of their pregnancy as well as during the early stages of parenting (Bardacke & Duncan,

2013). The mothers reported when they were able to use meditation and breathing while interacting with their child, they could produce a calming environment and promote a stronger bond (Bardacke & Duncan, 2013).

In 2007, the California Pacific Medical Center (CPMC) created the Mindful Motherhood Project. This study examined the use of mindfulness meditation to encourage a mother's awareness of her surroundings in order to create a soothing environment for postnatal mother-infant attachment (Krongold, 2011). The eight-week program consisted of weekly two-hour classes that taught prenatal yoga, mindfulness meditation and stress reduction techniques. The study used the Mindful Attention Awareness Scale (MAAS) to measure whether the women were able to maintain moment-to-moment awareness and how this correlated to the connection the mother feels towards their baby (Brown & Ryan, 2003). The fifteen participants were required to complete a baseline MAAS assessment, post-training assessment and three-month qualitative follow-up interview where both mother and baby needed to be present in order for the researchers to observe the interactions and developing attachment style (Krongold, 2011). It was found that the majority of mothers who took part in the study found that mindful practice helped to enhance the quality of the mother-infant relationship (Krongold, 2011).

Statement of Purpose

The purpose of this study is to assess a pilot Mindfulness-Based Prenatal Yoga (MBPY) program and its impact on the prenatal and postnatal bond felt by mother and child. The research questions guiding this study are as follows: 1) Do

pregnant women who participate in MBPY classes experience an increase in prenatal attachment with their baby? 2) Does participation in the MBPY program increase a woman's ability to create a stronger awareness of their baby? 3) Do women who take part in MBPY classes while pregnant report feeling positive postnatal attachment with their newborn?

The intended goal of this research is to explore the potential benefits of prenatal mindful practices, such as yoga and meditation, on the women's increased awareness and feelings of attachment towards their baby.

Significance of Study

In 2010, Meinzer and Toriggin conducted an analysis of all relevant studies linked to prenatal yoga and meditation. Meinzer and Toriggin (2010) concluded that while there is an established link between prenatal yoga and the psychological well being of the mother, little research has been done to evaluate mindfulness-based practice and the effect it may have on the formation of positive pre- and postnatal attachment of mother and child.

This research project provides a unique area of study for the social work field. Evaluating a pilot program such as this provides a great deal of knowledge as to whether to further explore mindfulness as an effective method of practice in helping encourage the formation of stronger mother-child bonds both during and after pregnancy. The use of mindful skills during pregnancy, childbirth and early parenting, if found to be successful, would be a great addition to social work because mindful-based techniques can be easily practiced almost anywhere. Deep breathing,

5-minute meditation and learning to be present in the moment are several methods that women participating in the research were taught and reported using throughout their daily activities. This daily application of mindfulness practices can help to build more emotionally resilient parents who are able to employ positive coping methods during stressful interactions with their child, leading to the presumption that through the use of these healthy mindfulness-based interventions, there may be an increased opportunity for a strong mother-child bond to be made.

CHAPTER II

LITERATURE REVIEW

This literature review explores the connection between maternal attachment style and childhood development, both pre- and postnatal. It also focuses on the use of mindfulness and prenatal yoga as a way of combating emotional distress, which may be linked to the formation of deeper connections between mother and child. The research that will be presented addresses the importance of a healthy mother-infant bond and the need for continued evidence-based research in order to better understand the potential relationship between mindfulness and maternal attachment.

Ainsworth and Bowlby (1979) presented the idea of maternal attachment as a “biologically driven construct within humans, which is designed to preserve the species through nurturing and protective behaviors” (p. 204). These nurturing and protective behaviors play an extremely important role in a child’s ability to adapt to his or her external environment (Ainsworth & Bell, 1969). A baby’s innate need for security, closeness and protection from fear or pain is directly related to the history of interactions with the primary caregiver (Araneda, Santelices & Farkas, 2010). A lack of early maternal bonding has been shown to greatly impair a child’s social, emotional and cognitive development; therefore, a mother’s capacity to form a strong attachment with her child may shape that individual’s longstanding attachment style, potentially affecting one’s relationships across generations (Alhusen, Hayat & Gross, 2013).

Maternal Attachment and the Formation of Relationships

The Attachment Theory emphasizes that early mother-infant relations will set the stage for a child's development of inter-personal relationships (McElwain, Wu, & Booth-LaForce, 2011). A secure attachment style of child and caregiver has been associated with lower levels of aggressive behaviors towards friends by age 3 (McElwain, Cox, Burchinal & Macfie, 2003), less negative interactions with friends by age 5 (Youngblade & Belsky, 1992) and the ability to form close friendships by age 10 (Frietag, Belsky, Grossman, Grossman & Schuerer-Englisch, 1996). According to the National Institute of Child Health and Human Development (2001), children with inconsistent or insecure maternal attachments tended to have highly erratic responses when interacting with their peer, which, in turn, compromises their capability to bond.

Siddiqui, Hagglof and Eisemann (2000) analyzed the correlation between prenatal attachment style, the way in which the mother remembers her own childhood experiences and the subsequent effect this may have on the their child's capacity to form healthy relations with others. They found that mothers who had experienced affection and emotional warmth during childhood felt a greater connection to their own child both pre- and postnatal (Siddiqui et al., 2000). Sable (2007) conducted a study based on the idea that attachment style can trickle down to later generations stating,

Children raised in relationships that are nurturing and secure, promotes development of adults who are self reliant, confident about their ability to love and be love. Conversely lack of secure attachment can lead to difficulties in regulating emotions and relating to others, engendering a vulnerability to psychological distress (p. 361).

A study by Roisman, Madsen, Hennighausen, Sroufe and Collins (2001) compared the pattern of an individual's romantic relationships as an adult to the pattern of an individual's experience of maternal attachment. The results of their study showed a significant association between the quality of childhood attachment and the subsequent quality of romantic partnerships.

Maternal Attachment and Childhood Development

The maternal attachment style also seems to be closely linked to a child's emotional development (Pauli-Pott & Mertesacker, 2008). Securely attached infants can effectively self-regulate their response to stressful events, while insecure attachment can produce individuals who either over- or under-emphasize their emotional response to distress (Berline & Cassidy, 2003). Saarni, Mumme and Campos (1998) found that a child's formation of emotional reactions is based on the communication style of the caregiver, which often is related to the style of attachment.

From the early moments of conception the fetus becomes a conscious being. The first neural connections in a baby's brain begin developing within weeks and by the third trimester results in a large growth spurt of the brain with rapid

developmental processes taking place (Schoore, 2001). The right hemisphere of the brain is essential in the development and processing of social-emotional information, feelings of attachment and responses to environmental stimuli (Shorne, 2001). In 2001, Shorne conducted a research study that focused on the maturation of the right side of the brain in-utero and how this factors into one's attachment style through the later stages of life. The findings showed a relationship between the mother's level of stress due to the surrounding environment and her ability to bond with her unborn child and the development of her baby's right brain, which led to underdeveloped social-emotional control centers in the brain (Shorne, 2001). Similarly, a longitudinal study conducted by Alhusen, Hayat and Gross (2013) examined mother-infant attachment styles and the consequent developmental outcomes during early childhood. The researchers followed a sample group of low-income, pregnant women for a period of 1-2 years in order to observe maternal attachment quality over time. They found that mothers with avoidant maternal attachment tendencies prenatally, when compared to women with less avoidant attachment styles, demonstrated a greater likelihood to give birth to children who were unable to meet age-appropriate milestones in the Five Developmental Domains (i.e. communication, gross motor, fine motor, problem solving and personal-social).

One of the most influential theories on human development is Bowlby's (1982) Attachment theory, which emphasizes the importance of affectional bonding between caregiver and child. Research shows that childhood behavioral and psychological development is a direct reflection of the style of care and response a

child receives (Meinzer & Toriggino, 2010). Despite the poor developmental outcome of children raised in insecure attachment bonds, recent evidence suggests that prenatal yoga and mindfulness-based practice may moderate maternal attachment style and/or poor postnatal parenting habits (Saavedra, Chapman, & Rogge, 2010). Thus, because attachment is integral in understanding the development of a child, it is important to continue to investigate the impact of mindfulness on maternal attachment during and after pregnancy.

Mindfulness-Based Practice and Pregnancy

The practice of mindfulness can be described as a way of being that can open the mind to the reality of one's surroundings and allow for moment-to-moment awareness of the environment (Lynn, 2010). Mindfulness stretches back centuries, playing a central role in Buddhist spiritual practice, the core essence of mindfulness being improved health, personal insight and overall wellness.

The use of mindfulness techniques pre- and postnatal, while widely known to decrease rates of anxiety and stress, can also work to enhance a parent's positive response rate when interacting with their child (Bailie, Kuyken & Sonnenberg, 2011). For example, in 2011, Bailie et al. conducted a qualitative study as part of a larger randomized clinical trial for a sample group of pregnant women who participated in a Mindfulness-Based Cognitive Therapy (MBCT) program designed to help combat their recurrent depression (Bailie et al., 2011). MBCT was delivered to the participating women in two-hour sessions over eight consecutive weeks with four subsequent follow-up sessions spread out over a period of one year. The program

followed the MBCT intervention manual, which incorporated (1) guided mindfulness practice, (2) enquiry into participants' experience of practice, (3) weekly homework reviews and (4) Cognitive Behavior Therapy. Qualitative interviewing was used as the source of data collection and analysis; transcripts from each interview were closely scrutinized so that any patterns and themes could be identified. At the conclusion of the study, the researchers reported finding several substantial changes between the two measurement points (before any MBCT training and one-year post). Of the sample group, 15 out of 16 participants continued to practice mindfulness-based techniques and reported a stronger emotional-attachment with their child. The most widely reported change related to continued mindfulness practice was the reduction in irritability, with 87% of participants stating that their level of irritability had greatly decreased allowing for a positive relationship with their child.

In 2008, Duncan and Bardacke developed a 10-week pilot study using Bardacke's (1998) Mindfulness-Based Childbirth and Parenting (MBCP) program, which was created as an adaptation of the Mindfulness-Based Stress Reduction program (Kabat-Zinn, 1990). The purpose of the MBCP intervention was to address stress, and pregnancy-induced anxiety among the participants. Participants in the MBCP program attended weekly, three-hour mindfulness meditation classes for the 10-week duration with the expectation that they would also practice mindful meditation outside of class time, with the help of a guided meditation CD. Another important aspect of the study was the element of supportive attachment and community building between the women; at the end of each meditation course a 15-

minute bonding period was held in order to reduce possible feelings of social isolation after giving birth. Researchers found that 81% of participating women experienced a significant decrease in anxiety from baseline to the 12-week post birth measurement. Additionally, 74% of women felt an increased sense of general mindfulness with 85% of those women reportedly using mindful meditation on a daily basis as a method of stress management. The researchers noted the limitations of their results due to the small, uncontrolled sample group, yet were confident enough in their findings that women who use mindfulness-based practices during pregnancy develop effective ways of responding to stress and anxiety, which, in turn, may influence positive attachment styles.

Prenatal Yoga

In recent research, the practice of prenatal yoga, in addition to mindfulness, has been found to have a great affect on the psychological and physiological health of pregnant women (Varambally & Gangadhar, 2012). A number of studies have shown that a mother's mental and physical state is directly linked to the development of a strong prenatal relationship (Ji & Han, 2009). This link is so prominent that, in Korea, prenatal yoga is a cultural practice that encourages greater maternal attachment through the use of yoga movements along with talking and singing to the baby regularly (Ji & Han, 2009).

Narendran, Nagarathna, Narendran, Gunasheela and Nagendra (2005) conducted a pilot study to test the efficacy of prenatal yoga practice and the subsequent postnatal attachment outcomes. The research team developed an

integrative approach of yoga therapy (IAYT), which was intended to allow the women taking part in the study to achieve deep relaxation through the practice of controlled posture and breathing techniques (Narendran et al., 2005). The intended goal of the IAYT program was to decrease the stress felt by the pregnant women and in turn increase positive maternal attachment over the course of a 20-week program (third trimester through delivery). During the first week, all participating women took part in an IAYT training course in order to learn specific techniques. For the remainder of the study, the women were asked to practice IAYT methods at home every day and were scheduled to meet with researchers every 3-4 weeks to talk about their experience. They found that the use of IAYT showed an 18% reduction in prenatal stress and a 21% reduction in prenatal physiological distress, both of which can have a great effect on the mother's ability to form healthy prenatal attachment to their growing baby (Narendran et al., 2005).

During pregnancy, the presence of physiological and/or physical distress can create a negative environment for both the expectant mother and her unborn child (Ji & Han, 2009). Ji and Han (2009) designed a 12-week study to investigate the effect of Qi exercise on maternal outcome and wellbeing, including maternal/fetal interaction. The treatment group ($n=70$) were expected to partake in twice weekly Qi exercise classes, which like yoga includes stretching, meditation and deep breathing but also teaches recognition of the surrounding positive/negative energy (Ji & Han, 2009). The control group ($n=70$) were offered standard yoga practice twice weekly for 12-weeks. Participants were qualitatively and qualitatively scored using personal

interview and self-administered surveys (Zung's Self-Rating Depression Scale (ZSDS), the Pregnancy Mild Discomfort Index and the Maternal/Fetal Interpersonal Communication Questionnaire). At the end of the study, the treatment groups reported having significantly less stress in their daily lives, were better able to handle potentially stressful situations and felt a greater connection with their child (Ji & Han, 2009). The control group, on the other hand, reported no change in maternal/fetal interaction but did show decreased emotional stress, although still 20% less of an increase in stress than the treatment group (Ji & Han, 2009).

Mindfulness-Based Prenatal Yoga and Maternal Attachment

Due to the preliminary effectiveness of both mindfulness and yoga-based practices in reducing pregnancy stress and increasing attachment with baby, programs have been developed that integrate both these approaches. For example, Muzik, Hamilton, Rosenblum, Waxler and Hadi (2012) offered a 10-week mindfulness-based yoga (M-yoga) class to a treatment group ($n=18$) of pregnant women (12-26 weeks) that scored high on the Edinburgh Postnatal Depression Scale at baseline. Along with the depression scale each participant completed self-scaling tools including the Five-Fact Mindful Questionnaire (FFMQ) and the Maternal Fetal Attachment Scale (MFAS) before and after the M-yoga program. Their findings suggested that their program was effective as mindfulness ($p = 0.007$) and maternal-fetal attachment ($p = 0.0$) significantly increased. Overall, the M-yoga pilot research project suggested that the use of mindfulness yoga practice should be further studied as an alternative

treatment for high-risk depressive women during pregnancy so that attachment and bonding are not threatened.

Another study by Krongold (2011) focused on the influences of mindfulness-based prenatal yoga upon the postnatal relationship between mother and infant. A group of 15 first-time mothers took part in an 8-week prenatal, mindfulness meditation program, part of the Mindful Motherhood Project, which was developed by Vieten and Austin (2008). The Mindful Motherhood program incorporated elements from several established mindfulness-based practices including Mindfulness-Based Cognitive Therapy (MBCT) and Mindfulness-Based Childbirth and Parenting (MBCP) (Krongold, 2011). The participating women were provided with weekly meditation and prenatal yoga classes, data collection consisted of in-depth interviewing at baseline and again four months postpartum to evaluate the participants' feelings of mindfulness and maternal attachment (Vieten & Austin, 2008).

During the postnatal interview, each participant described the ways the mindfulness skills impacted their relational capacities, behaviors and attitudes, these descriptions were then categorized by the researchers into four themes: a) affect regulation and cognitive flexibility of the mothers, b) increased availability of attention for their babies, c) emotional regulation with the baby and dyadic regulation of emotion, and d) initiation of mother-infant contact and the ability to reconnect after rupture (Krongold, 2011). All of the mothers who reported continued mindfulness practice post-program, stated they felt a greater bond with their child and felt they

were better able to handle emotionally exhausting situations, stating that they felt they had increased awareness in each of the four themes listed above. Through this awareness, 14 of the 15 participating women felt as though they were better able to experience and recognize their baby's emotions, needs and behaviors.

Summary

The significance of a healthy postnatal bond between mother and baby has been well established, however, the study of the development of prenatal attachment is a fairly new line of research. Prenatal bonding could in fact be an effective prediction of postnatal attachment style; meaning early prenatal intervention may help address certain behaviors that can affect the quality of mother-infant attachment postpartum.

Studies have shown that as mothers begin to recognize and respond to fetal activity, they tend to report experiencing increased affection towards their unborn child (Rubin, 1975). Therefore, the purpose of this study was to measure the impact of a prenatal, mindfulness-based yoga program on pre- and postpartum attachment style of the participants. Incorporating mindfulness skills throughout the pregnancy, may allow the woman to accept the idea of her fetus into her new sense of self (Rubin, 1975). This new sense of 'we-ness' may encourage optimistic outcome for postnatal attachment and lifelong development (Ruben, 1975).

CHAPTER III

METHODOLOGY

Overview

This pilot research project was used to examine a Mindfulness-Based Prenatal Yoga (MBPY) program. The study took place at Blossom Birth Services in Palo Alto, CA. The research questions guiding this study were as follows: 1) Do pregnant women who participate in MBPY classes experience an increase in their prenatal attachment during pregnancy? 2) Does participation in the MBPY program increase a woman's feelings of prenatal attachment while pregnant? 3) Do women who take part in MBPY classes while pregnant experience positive feelings towards postnatal attachment?

Research Design

The focus of this research was to measure the process as well as the outcomes for mindfulness practice during pregnancy and the mother's feelings of attachment to her baby both pre- and postnatal. This pilot study is longitudinal in nature and will be used to observe the same variables over a long period of time so that any changes of characteristics or developments both within the target group.

This research utilized a mixed-method approach, which included a quantitative and qualitative design. Quantitatively, precise and generalizable statistical findings assisted in measuring the variables of mindfulness and prenatal and maternal attachment (Rubin & Babbie, 2011). The qualitative aspect acted as a

guide in modifying the structure of the program so that it best fits the participant's needs.

Sampling Plan

Blossom Birth Services recruited twenty low to moderate-income women expecting their first child who could take part in the entire 12-week Program. The following criterion had to be met in order to partake in the MBPY program; participants were 18-35 years of age and in their second trimester at the start of the program; they needed to have a functional knowledge of written and verbal English and had approval from their primary care physician to participate in this program. Participants also agreed to attend all classes and follow-ups.

Exclusion from the program included medical illness, self-reported drug use, mental illness or regular, extensive yoga practice. Blossom has its own client base and advertised the study to their current members. Additionally, Blossom partnered with other community-based organizations to spread the word about this program in an effort to recruit a set of participants that meets these eligibility criteria. The entire group served as the sample for this study. It was communicated to the participants during the recruitment process that due to the nature of the funding from the Bella Vista Foundation, if they agree to participate, they would be participating in the entire program, which included the free bi-weekly classes and the evaluation of the program.

Instrumentation

This study used a mixed-method design, combining quantitative and qualitative approaches. The qualitative aspect was captured through brief interviews with the participants throughout the duration of the course.

Weekly check-ins with the participants concentrated on discussing the women's practice of the mindfulness techniques in their everyday life outside of class. On the final day of class and four months after the completion of the program, an in-depth focus group provided the women with a chance to offer feedback regarding the effectiveness of the program including the instructor, structure of the class, class ambience and time allocated to mindfulness practice. The quantitative piece of the research required the participants to complete three measurement tools (Appendix C) listed and described below.

The Prenatal Attachment Inventory (PAI) was created to assess the extent of the unique and affectionate relationships that develop between a woman and her fetus (Muller, 1989). This instrument contains 21 Likert-scale questions to be rated on a 4-point scale ranging from (1) almost never to (4) almost always with higher scores indicating higher feelings of attachment.

Another quantitative instrument that was used in the study is the Five-Facet Mindfulness Questionnaire. This survey focuses on the five facets of mindful behaviors: a) observing b) describing c) acting with awareness d) non-judging of inner experience and e) nonreactive to inner experience. The 39 items are rated on a

5-point Likert scale ranging from "never or very rarely true" to "very often or always true," with higher scores indicating higher levels of mindfulness (Baer et al., 2006).

Lastly, the Maternal Attachment Inventory (MAI), a 4-point scale, was given to the mothers postnatal in order to statistically measure maternal affection and attachment to their newborn (Muller, 1996). The MAI works to show correlation between How I Feel About the Baby Now, Maternal Separation Anxiety Scale, and a postnatal version of the Maternal Attitudes and Maternal Adjustment Scale (Muller, 1994).

Data Collection

This research was used to evaluate the possible relationship between the Mindfulness-Based Prenatal Yoga (MPBY) program and attachment between the mother and child; this is an important addition to the literature linking pregnancy, mindfulness yoga and attachment with baby. All participants signed informed consents (Please see Appendix A) before taking part in the study. Data were collected during the period of the program, which began the week of May 19th, and continued through the week of August 5th, 2013. Additionally, the final round of data were collected 3 months postpartum, which occurred in Mid-December, 2013.

The qualitative component of the study set-aside time before each class in order to hold a discussion with the moms related to their experiences with the classes and assigned homework. On the final the day of the MBPY program, a post-evaluation focus group was conducted with the participants. All mothers were encouraged to return three months postpartum with their baby in order to gather data

related to their ability to attach with their newborn baby and their continued practice of mindfulness skills.

The qualitative data were supplemented with the quantitative measurement tools that tested the hypotheses. The measures were passed out at the beginning of the first session and it was anticipated that it took 30-40 minutes to complete. The instruments were entered into SurveyMonkey, which made it convenient for the participants to complete the surveys online or on paper. Baseline measurements were collected immediately before the prospective mothers start the 12-week MBPY program. In order to get a longitudinal perspective of when and how the changes happen, data collection used the same tools at the start of the MBPY classes, the 6 week mid-mark, the 12 week conclusion and finally 3 months postpartum. The 3-month postnatal survey shed light on the sustainability of the techniques and way of being even after the completion of the program and also helped the researchers with future programmatic planning.

Plan for Data Analysis

The qualitative data focused largely on the information collected during the weekly check-ins with the mothers. Any themes within the reports were identified using Neuman's five-part plan for qualitative data analysis, which draws attention to the importance of language and images in data collection (Neuman, 1997). These five steps include: 1) classifying and selecting (to organize data), 2) open coding (assigning patterns/themes), 3) axial coding (organizing themes into categories), 4) selective coding (establish major patterns/themes) and 5) interpreting and elaborating

(compare and contrast major patterns/themes) (Neuman, 1997).

The results of the Prenatal Psychosocial Profile (PPP), Prenatal Attachment Inventory (PAI), Five Facet Mindfulness Questionnaire (FFMQ) and the Maternal Attachment Inventory (MAI) were coded and entered into SPSS and scores were calculated as per instructions of each instrument. Univariate analysis was used to run frequencies on all variables, while Bivariate analysis techniques were conducted to examine the differences in scores over time.

Protection of Human Subjects

There were 2 levels of protection offered to participants in the program, overall. The first was related to Blossom's process and the eligibility to even apply to this program and the second was related to the evaluation piece. Blossom requires all its clients to sign a waiver form (please see Appendix G). Also, as explained above, they required every potential applicant to provide an approval form signed by their primary care physician in order to be considered for this program.

The evaluation of the program began after IRB approval. The participants were informed by Blossom during the application and selection process that as part of their voluntary participation in this Pilot Program they were also agreeing to complete the tools/interviews to help evaluate the program as the complete pilot project is being funded by the Bella Vista Foundation and they could choose to not be part of the pilot program without any penalty or loss of benefits. Participants knew that the data obtained would be protected from inappropriate disclosure under the law and would be securely locked during the course of the study. They were informed that

their individual names or any kind of identifying information would not be reported in the study report; that all findings would be reported in aggregate. They were also informed that all notes will be shredded and tapes erased one year after the completion of the study.

CHAPTER IV

RESULTS

The focus of this study was to examine mindfulness and its impact on maternal attachment among pregnant women participating in a pilot Mindfulness-Based Prenatal Yoga (MBPY) program which was offered through Blossom Birth Services. The study measured mindfulness and pre- and postnatal attachment of the women taking part in the twelve-week pilot program. The purpose of this study was to record any significant changes in mindfulness and attachment that may have occurred through participation in the MBPY classes. The research questions guiding this study were as follows:

- 1) Do pregnant women who participate in MBPY classes experience an increased sense of mindfulness?
- 2) Does participation in the MBPY program increase a woman's feelings of prenatal attachment?
- 3) Do women who take part in MBPY classes while pregnant experience increased feelings of postnatal attachment?

This chapter will discuss the results of the research and compare the participants' mindfulness and attachment scores at four different time points. All quantitative data were gathered through self-administered surveys at three points over the twelve-week MBPY program. A final round of data collection, which included face-to-face surveys as well as online questionnaires using SurveyMonkey, took place

four months after the conclusion of MBPY program. The quantitative data were coded and analyzed and tests of difference were run in order to compare the changes in mindfulness and attachment over time. Qualitative data were collected via two focus groups, one of which occurred at the conclusion of the twelve-week MBPY program and the second four months post program conclusion. The responses recorded during the focus groups were transcribed and examined for potential patterns and themes.

Overview of Sample

There were a total of 19 women, all of whom were expecting their first child, who were selected to take part in the pilot program based on demographic information gathered prior to the start of the MPBY program. The criterion for inclusion in the MBPY program, as determined by Blossom were as follows: participants were required to be between the age of 18-35 years and in their second trimester at the start of the program; they needed to have a functional knowledge of written and verbal English and have approval from their primary care physician to participate in this program. Participants also agreed to attend all classes and follow-ups.

Only 15 women completed the entire study. The average age at the onset of the program was 30.158 years old. The average length of gestation was 20.63 weeks with a range of 14 to 29 weeks. Of the 15 participants who completed the program, 86.67% (n = 13) were married while 13.3% (n = 2) reported living with a partner. A majority of the participants (53.3%, n = 8) were Caucasian, three (20%) were Asian

American, and 26.67% (n = 4) reported their ethnicity as “other”. The majority of participants (60%, n = 9) reported having attended graduate or professional school, while 40% (n = 6) reported having attended college. When it came to employment status, 60% (n = 9) were employed full-time, 20% (n = 3) were employed part time, and 20% (n = 3) were unemployed. In regards to total approximate family income, 60% (n = 9) of participants reported incomes above \$100,000, while 20% (n = 3) reported between \$50,001-\$100,000, 13.33% (n = 2) reported \$25,000-\$50,000, and 6.67% (n = 1) reported less than \$25,000. Finally, in regards to health care coverage, 80% (n = 12) reported having private insurance, 13.33% (n = 2) reported “other coverage,” and 6.67% (n = 1) reported Medicaid.

Table 1

Demographic Information

19 STARTED THE PROGRAM; 15 COMPLETED		
AGE	30.16	
MARITAL STATUS	MARRIED	86.67% (13)
	LIVE W/ PARTNER	13.3% (2)
ETHNICITY	CAUCASIAN	53.3 (8)
	ASIAN AMERICAN	20% (3)
	OTHER	26.67% (4)
EDUCATION	GRAD/PROFESSIONAL	60% (9)
	COLLEGE	40% (6)
EMPLOYMENT	FULL TIME	60% (9)
	PART TIME	20% (3)
	UNEMPLOYED	20% (3)

Mindfulness Scores

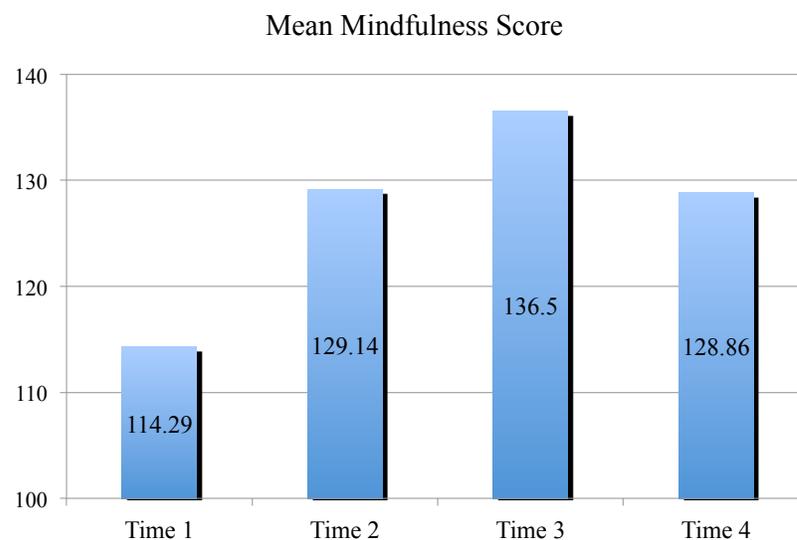
The *Five Facet Mindfulness Questionnaire* (FFMQ) is a 39-item instrument that measures the 5 subscales of mindfulness. The items are rated on a 5-part Likert scale ranging from 1 (never or very rarely true) to 5 (very often or always true). Total scores, once added together, can range from 39 to 195, with higher scores reflecting higher levels of mindfulness.

Before beginning the MBPY program, baseline measures for each participant were taken. The mean mindfulness score for time 1 was 114.29 with a standard deviation of 10.14. The highest reported score for time 1 was 129 and the lowest 84. Time 2 scores were taken at the mid-point (6th week) of the 12-week MBPY program. Results showed an increase in mean score with 129.14 (SD=10.2). The highest reported score for time 2 was 154 and the lowest 111. At the final MBPY class (12th week), time 3 measurements were taken with a mean score of 136.5 and SD=10.6, a high score of 159 and a low of 116. Time 4 data were collected 4 months after the MBPY program had ended with a mean of 128.86 and SD=12.08. The highest score for Time 4 was recorded at 152 and the lowest at 104. Time 3 had the highest mean score of 136.5 as well as the highest maximum score of 159.

Table 2

Means and Standard Deviations for Mindfulness Score

	Time 1	Time 2	Time 3	Time 4
Mean	114.29	129.14	136.50	128.86
Std. Error of Mean	2.32	2.75	2.73	2.93
Std. Deviation	10.14	10.20	10.60	12.08
Minimum	84	111	116	104
Maximum	129	154	159	152

*Figure 1: Mean Mindfulness Score*

Finally, a comparison of Time 1 (M=114.29 SD=10.14) to Time 4 (128.86, SD=12.08) with conditions $z(18) = -2.79$, $p = .005$, identified a statistically significant change in the mindfulness scores of the participants from Time 1 to Time 4. These results show that the participants' overall mindfulness skills increased significantly

from the time they started the program to the 4-month follow-up after completing the MBPY program.

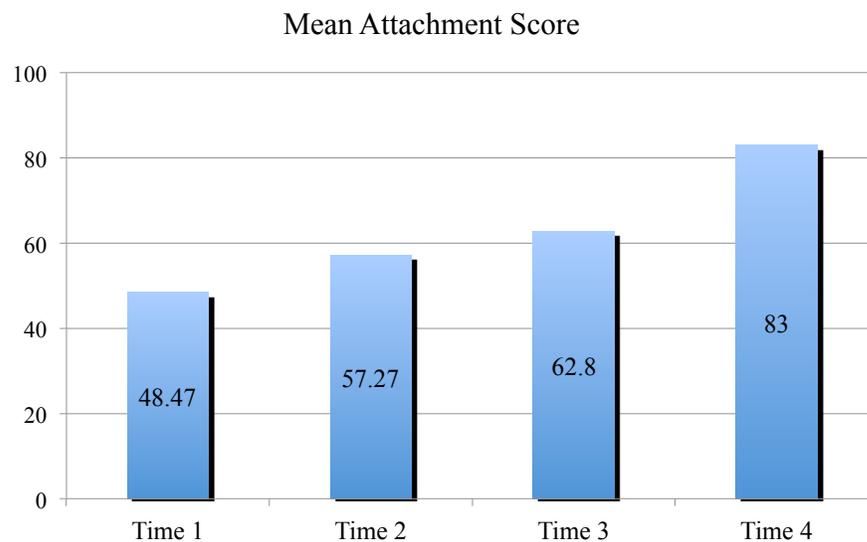
Prenatal Attachment Scores and Change over Time

Participants in the MBPY program were given the *Prenatal Attachment Inventory* (PAI) surveys to complete at 3 different time points (Time 1-3) over the course of 12 weeks. The PAI is used to assess the level of attachment that develops between a mother and her fetus during the prenatal period. This measurement tool consists of 21, 4-point Likert-scale items ranging in ranking from 1 (not relevant) to 4 (quite relevant). Total scores can range from 21 to 84, with higher scores indicating higher prenatal attachment. The initial (baseline) measurement was taken before beginning the first MBPY program, the mean score for prenatal attachment at Time 1 was found to be 48.47 and SD =10.55. The highest score recorded for the baseline survey was 69 and the lowest 29. Time 2 data were collected during the 6th week of classes with a slight increase (16%) in mean score (M=57.27, SD=12.9). The highest score for Time 2 was 74 and the lowest 27. The final PAI survey was given to the participants on the final day of MBPY class (12th week) and scores for Time 3 showed a mean score of (M=62.8, SD=12.63) and recorded a high score of 82 and a low of 43 (Table 3).

Table 3

Means and Standard Deviation for Prenatal and Maternal Attachment Scores

	Time 1	Time 2	Time 3	Time 4
Mean	48.47	57.27	62.80	83.00
Std. Error of Mean	2.42	3.22	3.15	1.27
Std. Deviation	10.55	12.90	12.63	5.08
Minimum	29	27	43	68
Maximum	69	74	82	88

*Figure 2: Mean Attachment Score*

The Wilcoxon signed-rank test showed a statistically significant change in prenatal attachment score from Time 1 (baseline) to Time 2 (6th week) with conditions $z(19) = -2.297$, $p = .022$. This result implied that the participants felt a greater sense of prenatal attachment at the 6th week mid-point of the MBPY program than at baseline. When comparing Time 1 ($M = 48.47$, $SD = 10.55$) to Time 3 ($M = 62.8$

SD=12.63), the Wilcoxon signed-rank test revealed a statistically significant difference; with conditions $z(17) = -2.137$, $p = .033$. These results indicate a significant variance between the women's feelings of prenatal attachment towards their baby at the start of the MBPY program and their feelings of attachment at the MBPY program conclusion.

Maternal Attachment Scores

Four months after the MBPY program concluded, each of the 15 participating women were given a *Maternal Attachment Inventory* (MAI) survey to complete. The MAI is a 26-item tool that is used to assess the attachment that develops between a mother and her child during the postnatal period. Each answer is scored on a 4-point Likert scale, ranging from 1 (almost never) to 4 (almost always). After the scores are added together, the potential range is between 26 and 104.

The Wilcoxon signed-rank test revealed a statistically significant change in the attachment score between Time 3 ($M = 62.8$, $SD = 12.63$) and Time 4 ($M = 83.0$, $SD = 5.08$) with conditions $z(16) = -3.409$, $p = .001$. This result suggests that the participants' feelings of attachment toward their child have significantly changed (increased) between the conclusion of the program (prenatal) to the four month MBPY program reunion (postnatal).

The Wilcoxon signed-rank test revealed a statistically significant difference between Time 1 (48.47 , $SD = 10.55$) and Time 4 (83.0 , $SD = 5.08$) with conditions $z(17) = -3.624$, $p = .000$. The results of this test suggest that the women's feelings of

attachment toward their baby increased between the start of the MBPT program and the 4-month follow-up.

Qualitative Findings

The quantitative measures were supplemented with qualitative data that were collected through two separate focus groups with the participants. The first took place at the conclusion of the 12-week MBPY program (Time 3) and the second was held four months after the MBPY program concluded (Time 4). The purpose of these focus groups was to collect more in-depth information regarding the women's feelings of mindfulness and pre/postnatal attachment.

Final MBPY Class Focus Group

At the final MBPY class, a focus group was conducted with the aim of understanding the participants' perceptions about the program. A major theme emerged, all of the women in the program reported feeling a deeper awareness of their own emotional needs as well as the emotional needs of their unborn child. One mother shared her ability to "sit with it [emotion] and just accept it and realize that your emotions are just are a reaction to something that happened, and that it's okay to just sit there with it." Another added, "I find my mind is constantly going so meditation really helped, which I thought it wouldn't. But it actually helps put my mind at ease." Participants also reported being "better able to notice when they become tense" and apply mindfulness skills such as breathing and meditation to "help realize what's happening and take those breaths."

Many of the women also felt that with this increased mindfulness came an enhanced sense of attachment with their baby. For example, one participant reported that at the start of the 12-week MBPY program, “I wasn’t attached to my baby at all, so now it just seems natural.” Another woman stated that when she first became pregnant “it was difficult for me to feel something from my babies” but over the course of the program felt better able to “pay attention to their movement and feel a bond.”

In addition, the participants reported that the mindfulness-based skills that they had learned allowed them to become more “in-tune with their baby” which helped to build a stronger bond with their child. One woman shared, “It took time to get into the mindfulness, but the baby is with me all the time so I feel that I need to remember that I’m not alone.”

Nearly all of the women reported that they had begun to incorporate mindfulness techniques in their day-to-day routine. One participant shared, “In terms of mindfulness I’ve been doing little snippets of it here and there, I didn’t dedicate myself to one thing this week I picked things that challenged me.” Another reported that mindfulness skills “have become so much more a part of my daily life that I know it’s made a big difference in the way I approach different situations.”

The Follow Up Focus Group

The final focus group took place four months after the MBPY program had ended in order to gather information related to the women’s continued use of mindfulness-based skills. One major theme centered on the participants’ use of

mindfulness skills in their life as a new mother. All of the participants agreed that life as a new mother made it more difficult to use mindfulness skills. The majority of the women attributed their decreased mindfulness practice to the stress of caring for a newborn child. One of the participants reflected on this change in mindfulness, “I felt like it was so hard in the beginning to stay mindful because there’s so much going on and your baby needs you all the time.” Another reported, “I will get back that mindfulness I had but right now all I do is take those deep breaths.”

While there was a decrease in overall mindful awareness, many of the participants still made it clear that they were still able to use the mindfulness skills they had learned through the MBPY program, “I struggled a lot in the beginning but I felt like that I was coping with everything and managing everything with the baby.” Another participant shared,

I had to remind us [myself and my husband] to have a mindful conversation together, just sit and really listen to each other. It was really great because sometimes you realize you have no idea what the other person is saying. It is really nice to concentrate on the words coming out of the other person’s mouth.

The topic of maternal attachment was discussed during the focus group and there were a number of positive reports from the women, “my baby is the most important thing and I think that she taught me mindfulness. Just being here in the present moment creates an intense bond.” Another stated “I feel like it [mindfulness] is kind of meaningful because I think in the beginning, at least for me there was a lot

of stuff that I was avoiding thinking of but I feel like mindfulness does increase your awareness of your child's needs.”

Summary

Overall, the results of this study provided intriguing evidence for mindfulness-based techniques and their positive relation to building and maintaining maternal attachment. The data revealed a steady increase in attachment score at each of the 4 time points. The most statistically significant change (increase) in attachment score was between the conclusion of the 12-week MBPY program (prenatal) and the 4-month follow-up (postnatal). This difference in score was not only shown in the quantitative data, but could be seen in the qualitative results as well. The women were able to implement mindfulness techniques, such as being present in the moment, to create a more intense bond between mother and baby.

The data collected for this study also revealed the potential for mindfulness-based techniques to be sustained over time. The mindfulness scores during the 12-week MBPY program showed statistically significant difference (increase) in scores from baseline to the program conclusion. Data collected at the 4-month reunion revealed a decrease in the participants' mindfulness score since Time 3; however, the scores were still at levels higher than when they started the MBPY program (Time 1). The women described their use of mindfulness techniques postnatal and attributed the decreased score to the stress of becoming a new mother. The women agreed that the skills learned during the MBPY program, though harder to implement after birth,

were still playing a positive role in their lives, allowing them to better connect with their new baby.

CHAPTER V

DISCUSSION

The purpose of this mixed-method study was to evaluate a pilot Mindfulness Based Prenatal Yoga (MBPY) program and its impact on mindfulness and maternal attachment. Fifteen women participated in the study that included bi-weekly MBPY classes over a period of twelve weeks. Standardized surveys were used for quantitative data collection (*Five Facet Mindfulness Questionnaire* and *Prenatal Attachment Inventory/Maternal Attachment Inventory*). Two semi-structured, focus groups were conducted to get more qualitative in-depth information; one at the MBPY program conclusion and the second four months after the program had finished.

This chapter summarizes the major findings and compares the findings with the findings of existing literature. The implications this study may have for social work practice and policy are described and the chapter concludes with a discussion of the limitations of the study and recommendations for future research.

Major Findings as They Relate to Literature

This study examined two variables, maternal mindfulness and pre- and postnatal attachment. One of the major findings in regards to mindfulness was the increased scores from time 1 (baseline) to time 2, which was measured at the halfway point (6th week) of the MBPY program. This finding was consistent with those of Lotan, Tanay and Bernstein (2013), whose study focused on a 4-week mindfulness-

based program. The researchers anticipated that both during and after the MBPY program, the women would begin to incorporate mindfulness-based skills into everyday life (Lotan, Tanay & Bernstein, 2013). Although the participants of their study were not pregnant, the results found that at the two-week mark of the program, there was a measured increase in mindful awareness ((Lotan, Tanay & Bernstein, 2013). Therefore, it seems that even short periods of mindfulness training can have an impact on a person's ability to be mindful.

The next major finding related to mindfulness was the difference in mean score between Time 1 (baseline) and Time 3 (MBPY conclusion) and the difference in mean score from Time 1 to Time 4 (12-week reunion). The data revealed a statistically significant difference in levels of mindfulness with a 19% increase between Time 1 and Time 3 and a 10% increase from Time 1 to Time 4. The majority of the literature supported these findings, for example, Dunn, Hanieh, Roberts and Powrie (2012) completed a study using the Mindful-Based Cognitive Therapy (MBCT) model to show prenatal mindful practice produced increased scores of mindfulness throughout the program. The results of the MBCT program illustrated an overall increase of 33% from the baseline measurement to the 6-week follow-up (Dunn et al., 2012). These findings suggest that mindfulness skills are typically higher at the conclusion of mindful interventions when compared with reported baseline skills. These results are supporting evidence for the effectiveness of mindfulness-based prenatal yoga programs as a way to increase mindfulness.

A major finding related to maternal-fetal attachment was the steady increase in mean attachment score at each point of measurement, Time 1 (baseline) through Time 4 (four month follow-up). Overall, the women reported feeling a greater emotional awareness and bond with their baby, with an average of 18% increase in attachment scores between each point of measurement. Yet, the most significant change was the overall rise in score from Time 1 (baseline) to Time 4 (four month follow-up), which showed a 69% increase in the new mother's feelings of attachment to their child. In comparison with the literature, the results of this study are similar to those reported in previous studies. In 2010, Cohen measured the change in variance of pre-and postnatal attachment score in relation to mindfulness. Cohen's (2010) findings show a positive relationship between mindfulness practice and increased feelings of attachment. The data showed a 38% increase in attachment score from the third trimester to 3-8 months postpartum (Cohen, 2010).

Although a mother's feelings of attachment towards their baby generally increase after birth, in the follow up focus group the women described feeling a deeper sense of mindfulness postpartum and had increased awareness of their child's needs. One possible explanation for this finding is that mothers do, in general, feel more attachment towards their babies once they can see and hold them, however, mindfulness does seem to enhance these feelings of attachment. During the final focus group the women shared that the mindfulness-based skills that they had learned allowed them to become more in-tune with their baby. One participant shared, "my

baby is the most important thing and I think that she taught me mindfulness, just being here in the present moment creates an intense bond.”

Implications for Social Work Practice and Policy

At the conclusion of this study, it was found that Mindfulness-Based Prenatal Yoga (MBPY) has the potential to increase pre- and postnatal mindfulness while also creating stronger feelings of attachment between the mother and child. The MBPY program presented safe and effective interventions that integrate the ethical responsibilities of a social worker to advance the general welfare and well-being of those they serve. Mindfulness emerging as an evidence-based approach makes it increasingly necessary for social workers to understand the benefits of mindfulness based interventions. A core component of mindfulness is being truly present in the moment without imposing judgment. This component upholds the ethical responsibilities of social workers to be mindful of client diversity, respect individual differences and practice cultural competence.

Attachment is considered an important variable in several areas of well-being and adaptive functioning. Attachment issues have been identified as resulting in long term trauma and malfunctioning of children and adults. If mindfulness-based interventions are found to be effective in increasing attachment they may be increasingly used in social work treatment methods and help to fill the gap in the need for more evidence-based practices.

Social work education programs can play a central role in teaching the value of mindfulness by including integrative practice approaches in the curriculum. For example, a study at the University of Saint Thomas in Minnesota, found that 64% of graduate level social workers believed mindfulness-based practice to be an important aspect of social work education (Koenen, 2013). Currently, in California, only two of the twenty-one accredited schools of social work offer courses on the value and implementation of mindfulness-based interventions (Board of Behavioral Sciences, 2014).

Self-care is an essential part of the social work profession. Social workers face challenges that can be emotional and physically draining making the practice of self-care critical in order to provide clients with the best possible treatment. Mindfulness practice offers techniques, such as deep breathing, and meditation, that can be used by social workers to decrease stress, increase self-awareness and improve coping skills. From a policy perspective, it is important to continue research on the impacts of mindfulness in the social work profession. Mindfulness training may soon become a key part of social work education, teaching techniques that benefit both client and social worker.

Limitations of the Study

One of the main limitations of the study was that there was no control group, which made it difficult to establish causality; therefore, even though the program shows promising results, it is not possible to conclude that the program was solely responsible for the changes in mindfulness and attachment scores. Another limitation

was the small sample ($n = 15$) the participants were also primarily well educated, with a higher than average median household income. In addition, the sample only included women who were committed to the 12-week program in its entirety; this could have unintentionally attracted women who were the most interested in learning about mindfulness and pregnancy.

Recommendations for Future Research

Future research would benefit from an experimental study that includes a control group with random assignment to the intervention and control groups. Using an experimental design would help to establish cause and effect and establish the effectiveness of the intervention more rigorously. A control group would enable researchers to compare attachment scores between new mothers with and without mindfulness-based guidance, which would help us conclude that the MBPY program had caused the change in attachment and mindfulness scores.

In addition, more research examining the long-term sustainability of the mindfulness skills (beyond four months) would be helpful in future program designs. This knowledge would make it known if and when a review course for mindfulness-based skills may need to be offered, or for just how long the mindfulness skills can be sustained. A study using a similar design, but also examining the postnatal development of the babies, would have the potential to drastically change how society views pregnancy and the importance of maternal attachment and mindfulness-based interventions for successful childhood development. As previously mentioned, the impacts of insecure attachment on a developing child can be severe, and long lasting.

If found to be effective, mindfulness-based prenatal programs have the potential to increase strong, healthy mother-infant bonding which may lead to healthier childhood development.

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APPENDICES

APPENDIX A

INFORMED CONSENT

Faculty from California State University, Stanislaus are collaborating with Blossom to do a pilot study on the 12-week Mindfulness Based Prenatal Yoga (MBPY) program being offered by Blossom. This program is being offered to you for free through a grant from the Bella Vista Foundation and therefore, and as explained to you during your application and selection process, it includes an evaluation component that is part of the program. The purpose of this evaluation is to explore your pregnancy experiences, your mindfulness, and prenatal and maternal attachment with your growing baby as you go through the program.

Research shows that women who engage in mindfulness training during pregnancy have reduced anxiety during pregnancy and also show greater connection with their unborn child. Research also shows that prenatal yoga significantly lowers preterm labor and improves babies' birth weight. We are hoping that with your participation you will experience some of these benefits and help us add to the knowledge base on mindfulness and prenatal yoga.

As part of being a participant in the program, you will be requested to complete 4 questionnaires, which will take 30 minutes or so at 4 different points. The first time will be right before you start the 12-week MBPY Program to get a baseline measure. Next, you will be asked to complete the measures 6 weeks into the program followed by at the conclusion of the program and a 3 month postpartum follow-up. Also, during the classes, there will be 2 members of the research team checking with you briefly about how the classes are working for you, including the instructor, the structure, the class ambience, and what we need to do differently for future classes. This will be captured through brief interviews through the duration of the course. The interviews will be recorded with your permission. If you complete all the components of the program and evaluation you will be provided a \$50 Blossom gift card. All costs associated with the program including the yoga mat and class materials will be covered.

The information collected will be protected from all inappropriate disclosure under the law. All data will be kept in a secure location. When we report the findings of the study, no individual names will be mentioned and all findings will be reported in aggregate. One year after the completion of the study, all tapes will be erased and all notes will be shredded.

As part of Blossom's process for including you in the pilot program, you will be required to provide consent from your primary health care provider. There are no risks anticipated as a result of your participation in the evaluation of the study. Your signing the form indicates that you understand you are agreeing to participate in the 12 week MBPY program and its evaluation. If you have any questions about this evaluation please contact me Shradha Tibrewal, at 209-667-3951. If you have any questions about your rights as a human participant, please contact the UIRB Administrator by phone (209) 667-3784 or email <mailto:IRBAdmin@csustan.edu>. Thank you for your consideration.

Sincerely,
Shradha Tibrewal, Ph.D. Professor, California State University, Stanislaus

Participant Signature Date

APPENDIX B
DEMOGRAPHIC PROFILE

Demographic Profile

Please complete this form by filling in the appropriate information below, and placing an X next to any questions with multiple choice answers.

Name: _____

Telephone: _____

Participant Age: _____

Weeks Pregnant: _____

Date of last prenatal visit: _____

Your racial/ethnic background:

- (1) European-American (White)
- (2) Asian-American
- (3) Native-American (Indian)
- (4) African -American
- (5) Hispanic
- (6) Other-Please specify:

Marital status:

- (1) Single
- (2) Married
- (3) Living with Partner
- (3) Separated
- (4) Divorced
- (5) Widowed
- (6) Other. Please specify _____

What is the highest level of education for you?

- (1) 8th grade or less
- (2) High school
- (3) High school diploma or equivalent
- (4) Junior College/Vocational School
- (5) College
- (6) Graduate/Professional School
- (7) Other-Please specify:

Total number of years of education: _____

Current employment status:

- (1) Employed full-time
- (2) Employed part-time
- (3) Unemployed
- (4) Retired
- (5) Other-Please specify: _____

Your occupation: _____

10. Total approximate annual family income from all sources:

- (1) Less \$ 25,000
- (2) \$25,000-\$50,000
- (3) \$50,001-\$100,000
- (4) Above \$100,000

11. Is English your native language?

- Yes No Other-Please specify:

12. Do you speak fluent English?

- Yes No

13. Are you able to read, comprehend, and write English?

- Yes No

Coverage

Medicaid ____

Uninsured ____

Private insurance ____

Other coverage _____

APPENDIX C

FIVE FACET MINDFULNESS QUESTIONNAIRE

Five Facet Mindfulness Questionnaire

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= never or very rarely true; 2= rarely true; 3= sometimes true; 4= often true; 5=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.	
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 D

PRENATAL ATTACHMENT INVENTORY

Prenatal Attachment Inventory (PAI)

The following sentences describe thoughts, feelings, and situations women may experience during pregnancy. We are interested in your experiences during the past month. Please circle the number under the word that applies to you.

1 = Almost never; 2 = Sometimes; 3 = Often; 4 = Almost always

	Almost Never	Sometimes	Often	Almost Always
1. I wonder what the baby looks like now.	1	2	3	4
2. I imagine calling the baby by name,	1	2	3	4
3. I enjoy feeling the baby move.	1	2	3	4
4. I think that my baby already has a personality.	1	2	3	4
5. I let other people put their hands on my tummy to feel the baby move.	1	2	3	4
6. I know things I will do make a difference to the baby.	1	2	3	4
7. I plan the things I will do with my baby.	1	2	3	4
8. I tell others what the baby does inside me.	1	2	3	4
9. I imagine what part of the baby I'm touching.	1	2	3	4
10. I know when the baby is asleep.	1	2	3	4
11. I can make my baby move.	1	2	3	4
12. I buy/make things for the baby.	1	2	3	4
13. I feel love for the baby.	1	2	3	4
14. I try to imagine what the baby is doing in there.	1	2	3	4
15. I like to sit with my arms around my tummy.	1	2	3	4
16. I dream about the baby.	1	2	3	4
17. I know why the baby is moving.	1	2	3	4
18. I stroke the baby through my tummy.	1	2	3	4
19. I share secrets with the baby,	1	2	3	4
20. I know the baby hears me,	1	2	3	4
21. I get very excited when I think about the baby.	1	2	3	4

APPENDIX E

MATERNAL ATTACHMENT INVENTORY

Maternal Attachment Inventory (MAI)

We are interested in your experiences during the past month. Please circle the number under the word that applies to you.

1 = Almost never; 2 = Sometimes; 3 = Often; 4 = Almost always

	Almost Never	Somet imes	Often	Almost Always
1 . I feel love for my baby.	1	2	3	4
2. I feel warm and happy with my baby.	1	2	3	4
3. I want to spend special time with my baby.	1	2	3	4
4. I look forward to being with my baby.	1	2	3	4
5. Just seeing my baby makes me feel good.	1	2	3	4
6. I know my baby needs me.	1	2	3	4
7. I think my baby is cute.	1	2	3	4
8. I'm glad this baby is mine.	1	2	3	4
9. I feel special when my baby smiles.	1	2	3	4
10. I like to look into my baby's eyes.	1	2	3	4
11 . I enjoy holding my baby.	1	2	3	4
12. I watch my baby sleep.	1	2	3	4
13. I want my baby near me.	1	2	3	4
14. It's fun being with my baby.	1	2	3	4
15. I tell others about my baby.	1	2	3	4
16. I enjoy having my baby cuddle with me.	1	2	3	4
17. I'm proud of my baby.	1	2	3	4
18. I like to see my baby do new things.	1	2	3	4
19. My thoughts are full of my baby.	1	2	3	4
20. I know my baby's personality.	1	2	3	4
21. I want my baby to trust me.	1	2	3	4
22. I know I am important to my baby.	1	2	3	4

APPENDIX F

PROVIDER APPROVAL FORM

Mindfulness Based Prenatal Yoga Pilot Program
PROVIDER APPROVAL FORM

_____ is my patient and we have discussed her plans to participate in mindfulness based prenatal yoga during her second and third trimesters and she has my approval to participate. She has no health complications that will put her or her pregnancy at risk as a result of participating in mindfulness based prenatal yoga. She is in her _____ week of pregnancy and the due date is _____.

Additional Provider Comments:

PROVIDER SIGNATURE: _____ Date: _____

Provider Name:

Address:

Phone No:

APPENDIX G

PRENATAL YOGA PARTICIPATION REGISTRATION

Prenatal Yoga Participation Registration

Please complete this form and return to the instructor. We respect your privacy, and we do not sell, trade, or give personal information.

I assume full responsibility for my actions in this class. I also assume responsibility for any actions I take or choose not to take related to issues discussed in this class. I will participate only to the degree that is appropriate for me. Should any injury occur, I agree not to hold liable Blossom Birth, staff, volunteers, or instructors.

Signature, Date _____

Name

Due Date

Email

Phone

Address

Emergency Contact

How did you hear about this class?

Please complete this form and return to the instructor. We respect your privacy, and we do not sell, trade, or give personal information.