Sadea Shahan

William Fifer

Infant Development Seminar

3 May 2013

Reducing the effects that cumulative maternal allostatic load poses on mother-infant interactions through mindfulness based family therapy in African American women

Aim:

In the United States, there is a significant disparity in birth outcomes between African American and White American mothers due to various factors such as socioeconomic status (SES), prenatal care, and exposure to risk factors during pregnancy among many others. But more importantly, it is the cumulative allostatic load that the African American mother faces over her lifetime that leads to this outcome.[1] Allostasis is a concept that describes the relationship between the biological, psychological and physiological responses to stress.[2] High allostatic load increases the risk of adverse birth outcomes such as preterm birth, perinatal death and low birth weight[2].

Often times, professional support can be more than valuable and necessary for proper treatment and care in reducing the effects of allostatic load. However, research has supported that the benefits of family support can often outweigh that of professional support during pregnancy. This has been clearly shown in a study where low income women were more likely to engage in adequate prenatal care if they received support from their partners and family. Interestingly, these women did not view professionals such as therapists and counselors as a form of social support,

[1] Lu MC, Halfon N. Racial and ethnic disparities in birth outcomes: a life-course perspective. M Child Health J. 2003;17:13–30.

[2] Hobel C.J., Goldstein A., Barrett E.S. Psychosocial stress and pregnancy outcome. Clin Obstet Gynecol. 2008;51:333–348.

which emphasizes the greater need for family and partner support and involvement during pregnancy.[3]

Furthermore, the importance and effectiveness of family therapy on stress reduction has been supported by various factors. Firstly speaking, the couples' distress affects both the emotional and physical well-being of adult partners and their offspring. Secondly, there has been increasing evidence of the effectiveness of family therapy not only in treating couple distress and related relationship problems, but also as a primary or supplementary treatment for a variety of individual emotional, behavioral, or physical health disorders.[4] Therefore, family therapy can greatly ameliorate pregnancy outcomes by reducing allostatic load since the positive interactions between the family and the partner serve such a pivotal role during pregnancy.

This proposed research project will use a mindfulness based intervention, namely, the Mindfulness-Based Childbirth and Parenting (MBCP) program that has been shown to have significantly reduced the stress and anxiety that mothers associate with pregnancy, parturition and postnatal care. Therefore, the present research study aims to use the MBCP model within the framework of family therapy in order to determine if such intervention is successful for reducing the effects of cumulative allostatic load on mother-infant interactions in primiparous mothers. Furthermore, if there is a reduction in the effects of the allostatic load on the mother, then it is expected that this should lead to a more healthy relationship between the mother and the infant, in addition to creating a secure attachment between them. Older African American women who are pregnant for the first time were found to be the most vulnerable to the negative effects of

---

[3] Schaffer, M. A. and Lia-Hoagberg, B. (1997). Effects of Social Support on Prenatal Care and Health Behaviors of Low-Income Women. Journal of Obstetric, Gynecologic, & Neonatal Nursing, 26: 433–440. doi: 10.1111/j.1552-6909.1997.tb02725.x

[4] Snyder, D. K., Castellani, A. M., & Whisman, M. A. (2006). Current status and future directions in couple therapy. Annual Review of Psychology, 57, 317–344.

high allostatic load and thus, out of any other social, ethnic and racial group, they will gain the most out of the mindfulness based family therapy sessions if the therapy is found to be as successful as is being hypothesized.

Background and Significance:

The allostatic theory provides for a way to incorporate the psychosocial, cultural, physiological and environmental influences that dictate the levels of stress, coping and adaptation in mother-infant relationships. Pregnancy itself can pose adverse psychological and physiological threats to the health of the mother and her fetus. Even mothers who do not meet criteria for preexisting conditions before conception that might have contributed to increased complications during and after pregnancy, can also develop pregnancy related difficulties such as preeclampsia.[5] However, whether or not these preexisting conditions also included a high allostatic load in the mother is still to be tested, as this factor alone, might have also led to the pregnancy complications.

Prenatal care by itself is not sufficient to treat the negative effects that allostatic load has placed on the interactions between the mother and her offspring. African American women—even those with high SES—are more prone to social stressors than White women. Prenatal care by itself does not reverse the cumulative effects of allostatic load as indicated by the higher rates of infant mortality in African American women despite the fact that they participated in prenatal care in their first trimester.[6] Prenatal care, however, can offer psychological support for the mother that can be quite helpful for the mother who does not have a high allostatic load during the prenatal and postnatal periods. But, the aspect of prenatal care, if any, that is conducive to the

[5] Shannon M, King TL, Kennedy HP. Allostasis: a theoretical framework for understanding and evaluating perinatal health outcomes. JOGNN. 2007;36:125–134.
[6] Lu MC, Halfon N. Racial and ethnic disparities in birth outcomes: a life-course perspective. M Child Health J. 2003;17:13–30.

treatment for improving mother-infant relationships in mothers with high allostatic load is yet to be teased out.

The physical and emotional care that an infant receives from his or her mother is vital in promoting the creation of neural pathways and synaptic connections in an infant since an infant is not born with a developed brain. These neural pathways and synapses allow for the infant to develop adequate physical, sensory and cognitive skills as reviewed by Siegel (2010).[7] The higher the quality of the interactions between mother and infant, the higher the likelihood of adequate physical as well as cognitive maturation in the infant as reviewed by Bernier, Carlson, & Whipple (2010).[8] Thus, interpersonal relationships between the mother and infant clearly impact the development of the infant's neural networks. But, how the interpersonal relationships specifically affect the development of the infant's neural pathways and synapses is yet to be studied.

Furthermore, an infant's brain development can be negatively impacted by exposure to chronic stress from the mother as reviewed by Rifkin-Graboi et al. (2009).[9] The mother's stress can affect the quality and amount of care that she provides to her infant. As reviewed by Siegel & Hartzell (2003), an infant may not receive the soothing and holding that he or she may require when in distress from a stressed mother. The negative results of this behavior on the cognitive, physiological and psychological development of the infant can persist even into adulthood.[10]

---

[7] Siegel, D. J. (2010). *Mindsight.* New York, NY: Bantam Books

[8] Bernier, A., Carlson, S. M., & Whipple, N. (2010). From external regulation to self-regulation: Early parenting precursors of young children's executive functioning. *Child Development, 81*(1), 326–339.

[9] Rifkin-Graboi, A., Borelli, J. L., & Bosquet Enlow, M. (2009). Neurobiology of stress in infancy. In C. H. Zeanah (Ed.), *Handbook of infant mental health* (pp. 59–79). New York, NY: Guilford Press.

[10] Siegel, D., & Hartzell, M. (2003). *Parenting from the inside out.* New York, NY: Tarcher/Penguin.

Rifkin-Graboi et al. (2009) and Siegel & Hartzell (2003) did explore the function that chronic maternal allostatic load have on the attachment developed between the mother and her infant, but they failed to discuss any interventions that might help to improve these attachments.

The importance of social support on prenatal care was shown by a study which found that low income women were more likely to engage in adequate prenatal care if they received support from their partners and family. [11] Interestingly, these women did not view professionals such as therapists and counselors as social support, which emphasizes the greater need for family and partner support. However, the specific aspect(s) of family support that might have led mothers to prefer family support over professional intervention was not examined.

The importance and effectiveness of family therapy has been well researched and documented. Snyder et. al (2006) explains that family therapy allows couples to see how their distress affects both the emotional and physical well-being of their relationship as well as their interactions with their offspring.[12] He, moreover, asserts that there is increasing evidence of the effectiveness of family therapy in treating couple distress and related relationship problems, in addition to acting as a primary or supplementary treatment for any type of individual emotional, behavioral, or physical health disorders.[12] Overall, this study shows that family therapy can greatly ameliorate pregnancy outcomes by reducing distress since the cooperation between the family and the partner serve such a pivotal role during pregnancy. Snyder et. al. (2006) however, failed to discuss how allostatic load may play a role in couples' level of distress and emotional

[11] Schaffer, M. A. and Lia-Hoagberg, B. (1997), Effects of Social Support on Prenatal Care and Health Behaviors of Low-Income Women. Journal of Obstetric, Gynecologic, & Neonatal Nursing, 26: 433–440. doi: 10.1111/j.1552-6909.1997.tb02725.x

[12] Snyder, D. K., Castellani, A. M., & Whisman, M. A. (2006). Current status and future directions in couple therapy. Annual Review of Psychology, 57, 317–344.

instability and how this might be displayed in their own individual psychopathologies as well as through their interactions with their offspring.

Krongold (2011) found that prenatal mindfulness based therapies can reduce stress, anxiety and depression during pregnancy, while improving the health of the mother and the infant during the birth process as well as the postnatal psychological health of the mother.[13] But how prenatal mindfulness based therapies can be effectively incorporated within family therapy, to produce these same results, was not examined.

Duncan and Bardacke (2010) proposed MBCP (Mindfulness-Based Childbirth and Parenting) which is a mindfulness program that is family based, as a treatment to reduce stress during pregnancy, parturition, and in post-natal parenting. [14] MBCP attempts to make the process of pregnancy and childbirth more familiar and thus more normal to the mother with the goal that by reducing fear, the experience of pregnancy and the transition to parenting can be made as comfortable as possible. The program helps its participants to focus on the present moment, leave the present moment, and then return back to the present with ease so that the participant can remove any past intrusive thoughts from her mind. These intrusive thought may include the past life experiences that have led her to develop such a high allostatic load.

The Duncan and Bardacke (2010) program, however, had various limitations in it. [22] Firstly, it had no control group. Moreover, the participants were from a higher SES group and therefore, they were highly educated and with an income that was far higher than the median.

---

[13] Krongold, K. S. (2011). Mindfulness-based prenatal care and postnatal mother-infant relationships. California Institute of Integral Studies). *ProQuest Dissertations and Theses,* 289. Retrieved from http://ezproxy.cul.columbia.edu/login?url=http://search.proquest.com/docview/897099328?accountid=10226. (897099328).

[14] Duncan, L. G., & Bardacke, N. (2010). Mindfulness-based childbirth and parenting education: Promoting family mindfulness during the perinatal period. *Journal of Child and Family Studies, 19,* 190–202. doi:10.1007/s10826-009-9313-7

Approximately 93% of the participants also had prior experience with yoga or meditation which might have affected the results of this study. Unlike in the present study that is being proposed where all the women will be African American, eighty nine percent of the women in Duncan and Bardacke's study were White.[15] All in all, these multiple factors bring into question the generalizability of the results.

Furthermore, in Duncan and Bardacke (2010)'s study, the researchers did collect numerical measures of the level of stress, pregnancy related anxiety, positive and negative affect, coping, depression, and mindfulness prior to and following the course, but there were no assessments that reported their progress following the nine week program. Nevertheless, the results did show a statistically significant increase in mindfulness and positive affect with a significant decrease in pregnancy related anxiety, negative affect and depression in the post course measure.

Even though Duncan and Bardacke (2010) did not conduct a quantitative measure as a follow-up, they did carry out a qualitative study where they asked questions to the mothers, postpartum.[22] In relation to the mindfulness practice, the questions asked if the MBCP program helped the mothers learn anything that assisted with their birth experience as well as their postpartum experience, especially as it relates to their emotional states during these events. As a result of the qualitative study, the participants were found to have used the mindfulness exercises to better manage their stress during pregnancy, the birthing process as well as any postpartum stress.

[15] Ibid., 193.

In the Duncan and Bardacke (2010)'s study, the mothers used the mantra of "staying in the present moment" during parturition and in their interactions with their partners and infants.[16] Therefore, having partners involved in this course was an important part of the learning experience. Duncan and Bardacke so far have been the only ones to publish information on the mother-infant relationship following mindfulness based interventions. In both of the studies (Duncan & Bardacke, 2010 and Vieten & Astin, 2008's study), pregnant women showed a significant reduction in negative affect and anxiety following a mindfulness intervention.[16,17] Both of the studies had a small sample size, but nevertheless, the effect sizes were high enough considering the low amount of participants. The results, however, are difficult to compare because both of the studies did not utilize the same measures of anxiety and mindfulness. Moreover, Vieten and Astin (2008) found significant differences between the treatment group and the control group, whereas Duncan and Bardacke (2010) conducted within group comparison since they lacked a control group.

Both (Duncan & Bardacke, 2010 and Vieten & Astin, 2008's study) of these mindfulness based prenatal care interventions did actually reduce the maternal stress as they had aimed to do so.[18,27] Furthermore, from the qualitative portion of Duncan and Bardacke's (2010) research, the mindfulness training was found to be beneficial to the development of secure postnatal mother-

[16] Duncan, L. G., & Bardacke, N. (2010). Mindfulness-based childbirth and parenting education: Promoting family mindfulness during the perinatal period. *Journal of Child and Family Studies, 19*, 190–202. doi:10.1007/s10826-009-9313-7

[17] Vieten, C., & Astin, J. (2008). Effects of a mindfulness-based intervention during pregnancy on prenatal stress and mood: Results of a pilot study. *Archives of Women's Mental Health, 11*, 67–74. doi: 10.1007/s00737-008-0214-3

[18] Vieten, C., & Astin, J. (2008). Effects of a mindfulness-based intervention during pregnancy on prenatal stress and mood: Results of a pilot study. *Archives of Women's Mental Health, 11*, 67–74. doi: 10.1007/s00737-008-0214-3

infant relationships.[19] The studies also reported that having partners present might have altered the outcomes, as well, due to the additional support of the partner which this present study proposes to study.[16, 24]

Research Design and Methods:

In this proposed study, the subject pool will consist of African American women of older age from all SES groups with a chronic and high level of allostatic load. In order to meet the criteria for having a chronic and a high level of allostatic load, the negative effects of the allostatic load have to be present in the mother for at least four years prior to her pregnancy and the stress must have caused notable impairments in her daily professional and personal life. Therefore, this study will be controlling for the level of allostatic load since all the women in the study have to be in the chronic allostatic load stage to be included in the study. Within this subject pool, any effects that variability in reproductive system might have played in the allostatic load of these women will also be explored. This specific subject group has been chosen for the study because as reviewed by Geronimus (1996), among African-American women, older mothers (in Geronimus' study, the older women were less than 35 years old) have a higher risk of giving birth to low birth weight infants than younger mothers.[20] Furthermore, Lu and Halfon found that African American women (even those with high SES) are more prone to social stressors than Caucasian women.[21] Therefore, a prediction of this study is that the older African

---

[19] Duncan, L. G., & Bardacke, N. (2010). Mindfulness-based childbirth and parenting education: Promoting family mindfulness during the perinatal period. *Journal of Child and Family Studies, 19,* 190–202. doi:10.1007/s10826-009-9313-7

[20] Geronimus AT. Black/white differences in the relationship of maternal age to birthweight: a population-based test of the weathering hypothesis. Soc Sci Med. 1996;42:589–597.

[21] Lu MC, Halfon N. Racial and ethnic disparities in birth outcomes: a life-course perspective. M Child Health J. 2003;17:13–30.

American women will benefit significantly more than their younger counterparts from the treatment intervention.

There will be 500 married women in this study from anywhere within the United States. The mothers in this study are primiparous and will be at most 34 years old at the time of their pregnancy. This specific age group will be investigated since a review by Jolly, Sebire, Harris, Robinson and Regan (2000) found that there is a much higher risk of complications during and after pregnancy in women over 35 years of age.[22]

As part of the treatment group, half of the women will be receiving family therapy and the other half of the women will not be receiving family therapy (control group). Both groups will be assessed three times—first, when the infant is three months old, later, when the infant is six months and lastly, when the infant is one years of age—for the effects of the therapy on their parenting as relevant to their allostatic load. These ages were chosen as they are a vulnerable period of development for the infant. The attachment style that the infant develops at age one seems to stay quite fixed later on as reviewed by Rosenblum et al., (2009)[23] and Wallin (2007).[24] The attachment style that the infant develops with his or her mother at one year of age can persist through childhood, all the way into the adulthood. Furthermore, the relationship that the primiparous mother develops with her first born can be transferred to her later born infants. Therefore, the unstable and unhealthy relationship that the primiparous mother with high allostatic load fosters with her first born can be replicated again in her later born leading to a highly dysfunctional family unit. However, the positive side of this dilemma is that in the case

---

[22] Jolly M, Sebire N, Harris J, Robinson S, Regan L. The risks associated with pregnancy in women aged 35 years or older. Hum Reprod 2000;15:2433–7.

[23] Rosenblum, K., Dayton, C. J., & Muzik, M. (2009). Infant social and emotional development. In C. H. Zeanah (Ed.), *Handbook of infant mental health* (pp. 80–103). New York, NY: Guilford Press.

[24] Wallin, D. J. (2007). *Attachment in psychotherapy.* New York, NY: Guilford Press.

that there is a significant change in the interaction between the mother and her infant, the attachment style can be changed from a preoccupied, fearful or dismissive attachment to a healthy and secure one.[25]

The data for this proposed study will be derived from a written questionnaire given to the mother postnatally, assessing the effects of family therapy on the mother-infant relationship, in addition to its role on allostatic load. The questionnaire will ask about the stressors that have led to a high allostatic load and how those stressors have been reduced or maintained as a result of therapy. Questions will not be asked verbally, but instead done through a written questionnaire, as there is a chance that a mother might not feel comfortable discussing the causes of her high allostatic load to an unknown experimenter. Responses will be assessed using narrative analysis and perspectives from psychodynamic therapy as reviewed by Lieblich, Tuval-Mashiach, & Zilber (1998)[26] and Polkinghorne (1988).[27] Infants will be present at the site where the mother will fill out the questionnaires so that therapists can monitor and assess mother-infant interactions.

The family therapy intervention that will be used is a prenatal mindfulness based program, specifically the Mindfulness-Based Childbirth and Parenting (MBCP) program. The MBCP program's effectiveness in reducing the effects that the mother's allostatic load has on the infant mother relationship, postpartum, will be investigated in this proposed study. The therapy sessions will be structured such that it follows the protocols of the MBSR (mindfulness-based stress reduction) program**.** Mothers will participate in the therapy for three hours a week for nine

---

[25] Snyder, D. K., Castellani, A. M., & Whisman, M. A. (2006). Current status and future directions in couple therapy. Annual Review of Psychology, 57, 317–344.
[26] Lieblich, A., Tuval-Mashiach, R., & Zilber, T. (1998). *Narrative research: Reading, analysis, and interpretation.* Thousand Oaks, CA: Sage.
[27] Polkinghorne, D. E. (1988). *Narrative knowing and the human sciences.* Albany, NY: State University of New York Press, Albany.

weeks since this is the duration of the Mindfulness-Based Childbirth and Parenting (MBCP) program.

Beginning with the MBSR program, the mindfulness-based interventions were originally designed to assist with stress reduction using the theories and practices of meditation and mindfulness.[28] These interventions were also primarily used to improve the overall well-being of the individual as reviewed by Biegel et al., 2009.[29] The MBCP used by Duncan and Bardacke, was based on the MBSR protocol.[30,31] In addition to the therapy sessions that meet weekly, the course also includes a day-long retreat. Participants are introduced and instructed to construct yoga as a home activity, but it is not done directly as part of the course. MBCP is distinct from other mindfulness based programs in that most of the participants and their partners take the class together in this program.[32] The partner does not necessarily have to be a spouse, but simply a member who provides much support to the mother who is in the program.

Therapy will be discontinued upon the therapists' recommendations that the patient's interactions with her infant has improved significantly as supported from the therapists own observations of the mother-infant interactions as well as from the self reports of the other family members who interact often with the mother. The therapy sessions will be led by a clinical

---

[28] Kabat-Zinn, J. (2005). *Full catastrophe living.* New York, NY: Bantam Dell.
[29] Biegel, G. M., Brown, K. W., Shapiro, S. L., & Schubert, C. M. (2009). Mindfulness-based stress reduction for the treatment of adolescent psychiatric outpatients: A randomized clinical trial. *Journal of Consulting and Clinical Psychology*, *77*(5), 855–866. doi: 10.1037/a0016241
[30] Duncan, L. G., & Bardacke, N. (2010). Mindfulness-based childbirth and parenting education: Promoting family mindfulness during the perinatal period. *Journal of Child and Family Studies*, *19*, 190–202. doi:10.1007/s10826-009-9313-7
[31] Kabat-Zinn, J. (2005). *Full catastrophe living.* New York, NY: Bantam Dell.
[32] Vieten, C., & Astin, J. (2008). Effects of a mindfulness-based intervention during pregnancy on prenatal stress and mood: Results of a pilot study. *Archives of Women's Mental Health*, *11*, 67–74. doi: 10.1007/s00737-008-0214-3

psychologist specializing in family therapy and these sessions will take place at the psychologist's office.

The participants will sign a consent form stating that the data provided from their therapy sessions and questionnaires will be used solely for research purposes. The data will be coded and there will be no information that will directly identify the participant with their data. The participants will visit their therapists for three assessment sessions: one when their infant will be six months of age, another when the infant will be nine months and lastly, when the infant will be a year old. A follow up assessment by the clinical psychologist will be made for both groups when the infant is three years old and again, when the child is six years old to see if the therapy has led to any long term changes in the mother-parent relationship.

Ideally, this would be a longitudinal study. Participants will be provided $50 for completing each assessment and therapy session as well as supplementary museum passes. Participants who have any history of any psychiatric disorders, have participated or are participating in any behavioral interventions to reduce the effects of their allostatic load, who cannot read and speak English and are on any psychotropic medications will be excluded from the study. Participants might feel some minor stress as they are reminded about their past and current psychological and physiological history as it relates to their allostatic load, but every attempt will be made to minimize those stress and anxiety levels as much as possible.

Predicted Results

On the most basic level, it is expected that the mothers who participate in the MBCP family therapy, no matter what their SES category is, will show improvements in their interactions with their infants. Furthermore, there will be higher successes in the mothers who along with their spouses engage in therapy, as compared to those mothers who engage other

family members—besides their spouse—in family therapy since women are more likely to engage in adequate prenatal care if they received support from their partners.[33] It is also predicted that across all SES groups, there will be some improvement in terms of mother-infant interactions and attachment, but a greater one will be visible in those with a higher SES. There should be minimal reproductive system differences as the study will be focusing on mothers who are pregnant for the first time.

Various limitations might impact the results of this proposed study. For instance, all women are not likely to describe their stressful experiences accurately and might fail to disclose some very stress provoking events for various reasons. It is challenging and may be unethical to discuss past traumatic and/or stress provoking events to pregnant women as it may affect their current stress response as well as that of their fetus. Furthermore, the father in the couple might not be as willing to participate in therapy as much as the mother.

In terms of any bias produced by the methods of the study, mothers will self report their stressors as well as how this has affected their relationships with their infants and this may be biased and distorted. In addition, there might also be recall bias in the mothers who are filling out questionnaires on stressors that may have occurred a few years to a decade ago. However, therapists will also monitor and assess the mother-infant relationship during the therapy sessions to reduce the bias produced by the self report aspect of the questionnaires.

For future research, it would be interesting to determine if there would be a different effect if the study was done on the infant's caregiver, in place of the infant's biological mother. Western culture values the idea of a single primary caregiver for an infant whereas in other

[33] Schaffer, M. A. and Lia-Hoagberg, B. (1997), Effects of Social Support on Prenatal Care and Health Behaviors of Low-Income Women. Journal of Obstetric, Gynecologic, & Neonatal Nursing, 26: 433–440. doi: 10.1111/j.1552-6909.1997.tb02725.x

cultures, the value of multiple caregivers is emphasized. Therefore, in Western culture, a mother is more likely to have more responsibilities as she is the primary caregiver and thus, she will feel the burden of cumulative allostatic load more strongly than a mother from an Eastern society. This points to the importance of conducting a similar study to this proposed one in Eastern societies to determine if these different cultural ideals of family structure have any impact on how the allostatic load is felt and maintained by the mother in these very different societies. Furthermore, it would be worthwhile to determine whether or not family therapy would have the same effect on both Eastern and Western societies in terms of reducing any negative effects that allostatic load might have on the caregiver-infant relationship.

Works Cited

Bernier, A., Carlson, S. M., & Whipple, N. (2010). From external regulation to self-regulation: Early parenting precursors of young children's executive functioning. *Child Development*, *81*(1), 326–339.

Biegel, G. M., Brown, K. W., Shapiro, S. L., & Schubert, C. M. (2009). Mindfulness-based stress reduction for the treatment of adolescent psychiatric outpatients: A randomized clinical trial. *Journal of Consulting and Clinical Psychology*, *77*(5), 855–866. doi: 10.1037/a0016241

Duncan, L. G., & Bardacke, N. (2010). Mindfulness-based childbirth and parenting education: Promoting family mindfulness during the perinatal period. *Journal of Child and Family Studies*, *19*, 190–202. doi:10.1007/s10826-009-9313-7

Geronimus AT. Black/white differences in the relationship of maternal age to birthweight: a population-based test of the weathering hypothesis. Soc Sci Med. 1996;42:589–597. Kabat-Zinn, J. (2005). *Full catastrophe living.* New York, NY: Bantam Dell.

Hobel C.J., Goldstein A., Barrett E.S. Psychosocial stress and pregnancy outcome. Clin Obstet Gynecol. 2008;51:333–348.

Jolly M, Sebire N, Harris J, Robinson S, Regan L. The risks associated with pregnancy in women aged 35 years or older. Hum Reprod 2000;15:2433–7.

Kabat-Zinn, J. (2005). *Full catastrophe living.* New York, NY: Bantam Dell.

Krongold, K. S. (2011). *Mindfulness-based prenatal care and postnatal mother-infant relationships.* California Institute of Integral Studies). *ProQuest Dissertations and Theses*, 289. Retrieved from http://ezproxy.cul.columbia.edu/login?url=http://search.proquest.com/docview/897099328?accountid=10226. (897099328).

Lieblich, A., Tuval-Mashiach, R., & Zilber, T. (1998). *Narrative research: Reading, analysis, and interpretation.* Thousand Oaks, CA: Sage.

Lu MC, Halfon N. Racial and ethnic disparities in birth outcomes: a life-course perspective. M Child Health J. 2003;17:13–30.

Polkinghorne, D. E. (1988). *Narrative knowing and the human sciences.* Albany, NY: State University of New York Press, Albany.

Rifkin-Graboi, A., Borelli, J. L., & Bosquet Enlow, M. (2009). Neurobiology of stress in infancy. In C. H. Zeanah (Ed.), *Handbook of infant mental health* (pp. 59–79). New York, NY: Guilford Press.

Rosenblum, K., Dayton, C. J., & Muzik, M. (2009). Infant social and emotional development. In

C. H. Zeanah (Ed.), *Handbook of infant mental health* (pp. 80–103). New York, NY: Guilford Press.

Schaffer, M. A. and Lia-Hoagberg, B. (1997), Effects of Social Support on Prenatal Care and Health Behaviors of Low-Income Women. Journal of Obstetric, Gynecologic, & Neonatal Nursing, 26: 433–440. doi: 10.1111/j.1552-6909.1997.tb02725.x

Shannon M, King TL, Kennedy HP. Allostasis: a theoretical framework for understanding and evaluating perinatal health outcomes. JOGNN. 2007;36:125–134.

Siegel, D. J. (2010). *Mindsight.* New York, NY: Bantam Books

Siegel, D., & Hartzell, M. (2003). *Parenting from the inside out.* New York, NY: Tarcher/Penguin.

Snyder, D. K., Castellani, A. M., & Whisman, M. A. (2006). Current status and future directions in couple therapy. Annual Review of Psychology, 57, 317–344.

Vieten, C., & Astin, J. (2008). Effects of a mindfulness-based intervention during pregnancy on prenatal stress and mood: Results of a pilot study. *Archives of Women's Mental Health*, *11*, 67–74. doi: 10.1007/s00737-008-0214-3

Wallin, D. J. (2007). *Attachment in psychotherapy.* New York, NY: Guilford Press.