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Unveiling complexities: Examining the role of traumatic loss in shaping the interplay between black maternal mental health and maternal bonding

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Abstract

Black women are more likely to experience traumatic birthing events, more likely to experience perinatal depression, and less likely to receive mental health treatment than women of other racial and ethnic backgrounds, and yet largely overlooked in perinatal mental health research. This pilot study seeks to understand how unacceptable racial disparities and adverse perinatal outcomes influence Black maternal depression and maternal bonding by exploring how prior traumatic loss moderates the relationship between depression and bonding during a subsequent pregnancy among a sample of Black mothers. We use survey data collected from 75 Black mothers as part of the Black Fathers, Equal Partners in Promoting Maternal and Infant Health study, a collaboration between the University of Wisconsin Madison and the African American Breastfeeding Network in Milwaukee, Wisconsin, USA. Study results suggest there is a correlation between maternal depression and bonding; when traumatic loss is included as an interaction variable, it produces a moderating effect, changing the direction of the relationship between bonding and depression. As maternal depression increases, bonding increases when moderated by the variable traumatic loss. This finding has important implications for infant mental health research and practice, disrupting the expectation that depression necessarily poses a risk to maternal–infant bonding.

KEYWORDS

black mothers, depression and maternal bonding, health disparities and mental health, infant mortality and maternal bonding, traumatic loss

1 | INTRODUCTION

Black mothers are traditionally overlooked in perinatal mental health research (Antilla & Johnson, 2024; Floyd et al., 2023; Hernandez et al., 2019). Recently, there has been a spike in literature that pertains to Black maternal mental health; however, current literature continues to perpetuate broader stereotypes of blame when it comes to Black mothers. Previous studies consistently problematize Black women who are struggling with mental health

disorders as the source of mental health issues for young infants and children (Parker, 2021). This problematizing of Black women as the source of community trauma is not a new phenomenon; however, it deflects research away from Black maternal health and toward infant mental health, which impacts community-based interventions that are offered to Black mothers (Hernandez et al., 2019; Roberts, 1997).

As literature on the epidemiology, etiology, and treatment of perinatal mental health disorders continues to expand, some scholars advocate for employing more community-based participatory action research strategies to engage and care for Black mothers' mental health and well-being more effectively (Declercq et al., 2022; Estriplet et al., 2022; Floyd et al., 2023; Hernandez et al., 2019). Critical scholars argue that to offer more culturally relevant and accessible practice-level mental health support to Black mothers, it is imperative to connect with the community by shifting the academic hierarchy of how research is traditionally done to a more emancipatory community action (Hernandez et al., 2019). Other research posits that "listening to Black mothers" (i.e., centering on Black women's experiences with perinatal mental health) is key for achieving genuine understanding of Black mothers' experiences and generating relevant policy-level interventions (Declercq et al., 2022). In the absence of an adequate understanding of Black mothers' lived experiences, policy and practice interventions may be built on a faulty foundation of stereotypes. To combat stereotypes propagated in popular media, Black women often shift the narrative of these stereotypes by engaging in what is known as the superwoman schema (Thomas et al., 2022; Woods-Giscombe et al., 2016). The superwoman schema is the idea that due to racist and sexist attitudes toward Black women in the United States, Black women perform "strength," (Thomas et al., 2022; Woods-Giscombe et al., 2016). The performance of strength looks like going above and beyond in all settings, even when given little resources to succeed. It also looks like the suppression of emotions and emotional vulnerability, as well as the obligation to caretake for others (Thomas et al., 2022; Woods-Giscombe et al., 2016). The performance of "strength" is correlated with higher rates of anxiety and depression among Black women; thus, it is harmful to Black women's mental health and well-being (Thomas et al., 2022; Woods-Giscombe et al., 2016).

The current study examines whether depressive symptoms (mild, moderate, severe PHQ-2 scale scores) and prior traumatic loss (prior miscarriage, prior infant loss, having an infant with a NICU stay) are associated with maternal pre- and post-natal bonding (the maternal representation of the infant and her feelings toward the infant) to consider how Black mothers' mental health can impact mothers' own feelings toward their infant.

Key Findings

- Prevalence of perinatal depression (30.3%) is strikingly high among the sample of Black mothers who participated in this study, residents of a city and state with some of the starkest racial disparities in health outcomes in the nation.
- It is well established that maternal depression is negatively associated with bonding: we find that when birth trauma is introduced as a moderator, the direction of the relationship changes such that maternal depression is positively associated with maternal bonding.
- Black women are at increased risk of perinatal depression and birth trauma compared to mothers of other racial and ethnic backgrounds; therefore, recognizing that birth trauma moderates the relationship between depression and bonding among Black mothers demonstrates that culturally congruent assessments and interventions are needed to improve Black maternal and infant mental health.

Statement of Relevance

Understanding Black women's response to trauma is key in developing clinical maternal–infant interventions that are culturally centered. This study demonstrates that prior experience of traumatic loss has a somewhat counterintuitive influence on Black women's experience of subsequent pregnancy, reversing the direction of the relationship between maternal depression and bonding, suggesting that prior traumatic loss impacts the development of the maternal–infant bond. Future research must recognize the interpersonal and mental health impacts of systemic racism on the maternal and infant dyad.

This pilot research is intended to deepen understanding of Black mothers' perinatal mental health and continue the push for more culturally congruent perinatal mental health interventions.

1.1 | Conceptual frameworks

There are two frameworks that provide a critical view for the understanding of maternal–infant relationships:

attachment theory and psychodynamic theory. In combination, these frameworks are crucial for clinical interpretations of the inter-relationship of mental health and the connection between mother and infant. In this study, we are looking at both pre and postnatal attachment. The most widely talked about form of attachment is the attachment between infant and mother. However, the study of attachment has grown to encompass prenatal bonding and the relationship that a mother develops with her expected baby before birth. Muller (1989) defines prenatal attachment as the connection between the woman and her fetus (Brandon et al., 2009), which gives rise to post-natal attachment, which is the attachment between mother and infant. Muller (1989) identifies that throughout the prenatal period, mothers begin to develop increasing feelings of affiliation toward the fetus while simultaneously acknowledging the cognitive and emotional parts of the fetus (Muller, 1989). This is seen through the ideation of the mother on imagining the baby and developing feelings of affection toward the fetus (Muller, 1989).

When conceptualizing attachment as a whole, there are interrelated parts that are determinant of the relationship between mother and infant. The first part is the response of the infant to the mother's cues, and the second part is the response of the mother to the infant's cues (Stern, 1995). Our study will focus on the second part of the bonding process, which is how the mother responds to the infant's/ fetus' cues. When the infant offers a bid for connection to the mother, a set of internal understandings are formed by the mother's reaction, which in turn develops the infant's attachment style (Ainsworth et al., 2015; Bowlby, 2008; Fearon & Roisman, 2017). When the mother consistently offers her care and support to the infant, a secure attachment is formed (Ainsworth et al., 2015; Bowlby, 2008). When the response to the infant's bids for connection are inconsistent or non-existent, the infant develops an insecure attachment style (Ainsworth et al., 2015; Bowlby, 2008). Additionally, the driving force of the mother's response to the infant's invitation for connection is influenced by the mother's internal representations. Maternal representations are a concept in psychodynamic theory that focuses on how a mother interprets her experiences (Stern, 1995). The mother's internal representation is developed in conjunction with what happens to her while with her caregivers, meaning that the mother's understanding of the world is through her early experiences and influences in connection with her own caregivers, both physically and emotionally (Stern, 1995). This representation then sets the stage for how the mother interprets the cues of the infant. For example, does she believe the bids for connection to be offensive? When the baby is crying, does she believe the baby is doing this in spite of her? Or does she believe the baby's cries are because of the baby's internal needs? Based on the internal representation of the mother, she will respond to the infant accordingly. Her response to the infant is what leads to the development of the infant's own internal working model and subsequently influences attachment style (Stern, 1995).

1.2 | Literature review

1.2.1 | The relationship between bonding and depression

There is a litany of prior literature that explores the relationship between depression and maternal bonding. Prior literature has investigated how depression alters the early dyadic relationship of the mother and infant, indicating that maternal depression can impede bonding and has a negative impact on the relational attachment of the infant (Flykt et al., 2010). Depression is instrumental in how one experiences their world, which influences their internal representations (Trapolini et al., 2008). A mother's internal representation (her understanding of the world based on her experiences) is central to bonding, as attachment theory posits that the mother's internal world is instrumental in how she responds to her infant (Slade et al., 1999). Other literature has synthesized how maternal depression and bonding with the infant during pregnancy are likely predictors of less healthcare involvement during the pregnancy period (Lindergren, 2001). Finally, literature has expanded on the notion that depressive symptoms and low maternal bonding have an impact on early infant development (Alhusen et al., 2013)

Maternal bonding is multifaceted, having an impact on both the infant and the mother's own maternal representations. Maternal mental health plays an integral role in the health and development of infants (Halligan et al., 2007). Maternal depression is associated with the development of psychopathology in childhood as maternal perinatal depression impedes the mother's ability to appropriately respond to the infant's cues (Halligan et al., 2007; Lachman et al., 2022). This leads to contemporary thought that children born to mothers with perinatal depression are at higher risk for mental health problems across the life course.

1.2.2 | Tension within perinatal mental health research

The ongoing perinatal research landscape is at tension regarding Black women and perinatal mental health. Contemporary literature argues that perinatal mood

disorders among Black women are associated with an increased risk of mental health disorders for their children (Estriplet et al., 2022). This narrative is prevalent throughout maternal mental health literature, problematizing Black mothers and stating that Black mothers are the cause of social ills within their communities (Parker, 2021). Infant mental health intervention research is shaped by this ongoing narrative about Black women's mental health, ignoring mental health supports for Black women (James et al., 2023; Parker, 2021). Infant mental health research and intervention are focused on providing support to caregivers to help improve the mental health and development of the infant. However, much of the current psychological intervention research uses a race-blind approach to the development of infant mental health interventions engaging in colorblind racism (Bonilla-Silva, 2003). This engagement in colorblind racism negates the impacts of racism on the maternal–infant bond, creating a system by which culturally relevant mental health interventions are limited (Estriplet et al., 2022). Following the replication of the aforementioned ideology leaves room to perpetuate stereotypes regarding Black motherhood, diminishing the value of Black womanhood to producing "functional adults" rather than as a whole person (Parker, 2021).

1.2.3 | The relationship between depression, bonding, and traumatic loss

There is a myriad of literature regarding the impact of maternal trauma on the maternal–infant relationship. Research shows that maternal trauma influences the overall bond with her infant. Some studies have discussed how mothers with prior trauma may misinterpret infant cues, which then impacts the maternal–infant bond (Cook et al., 2018; Erickson et al., 2019; Kolk et al., 2021). Prior research has indicated that mothers who have experienced trauma are more likely to emotionally distance themselves from their infant (Cook et al., 2018; Erickson et al., 2019), and that maternal trauma has broad repercussions for infant development (Cook et al., 2018; Erickson et al., 2019; Goodman et al., 2011). Not only does research show potentially negative consequences that may occur from trauma, but research that focuses specifically on traumatic loss indicates that mothers who experience traumatic loss experience elevated depressive and anxiety symptoms (Cook et al., 2018; Erickson et al., 2019; Tambelli et al., 2015). This underscores the importance of better understanding the relationship between depressive symptoms and maternal bonding in the context of perinatal traumatic loss.

1.2.4 | Gaps in the literature

Critical gaps in the perinatal mental health literature include little knowledge about Black women's perinatal experiences (Floyd et al., 2023). The lack of information about Black women's perinatal experiences is in large part due to the lack of community-based participatory action research in perinatal research that is inclusive of women from marginalized backgrounds (Hernandez et al., 2019). The literature also continues to focus on maternal bonding and depression as a central aspect of infant mental health and intervention rather than an important avenue for intervention for maternal mental health and well-being (Floyd et al., 2023). The current gaps in the literature erase the voices of Black women in perinatal mental health literature and impede the facilitation of culturally congruent care as research influences the development of clinical practice interventions.

1.2.5 | Current study

All the women sampled in this study resided in Milwaukee, Wisconsin. The location of this study is imperative to discuss to better understand the study results, as Wisconsin has some of the starkest racial health disparities in the country. Per Smeeding and Thornton (2018), in the state of Wisconsin, Black people are more likely to experience poverty at 2 and a half times that of the average poverty rate in the state. Not only are Black people 2 ½ times more likely than the state average to experience poverty while living in Wisconsin, but Black infants are 2.4× more likely than the average rate to die within the first 365 days of life (March of Dimes, 2023). Next, Black women in Wisconsin are 2.2× more likely than the state average to die during childbirth (Wisconsin Department of Health Services, 2022). These disparities are part of a pervasive pattern of racial discrimination in the United States, which substantially impacts Black women living in the Milwaukee metropolitan area (Olivier & Murph, 2024). Milwaukee is the most segregated city in the entire United States (Wojcik, 2021). In the state of Wisconsin alone, the rate of Black infant mortality is higher than any other area within the state, placing Black mothers at continuous risk of birth trauma (Denzin, 2023; Vinick, 2022). Each of these factors, poverty, access to care, and racism, are part of the larger concept of Social Determinants of Health (Datto, n.d.). Social determinants of health are defined by the World Health Organization as the "conditions by which people are born, grow, live, work, and play," which influences health outcomes for different communities of people and health disparities across communities (Datto, n.d.). Naming the racial disparities in

maternal and child health in Wisconsin and throughout the US, and the influence of social determinants of health, is imperative to the interpretation of study results. Black women and infants disproportionately experience adverse conditions and experience ongoing medical racism, which is why understanding how the mechanism of birth trauma influences the association between depressive symptoms and the maternal bond is important to reducing health and mental health disparities in the United States.

This study is a pilot study meant to open the question and further the understanding of depressive symptoms and maternal bonding amongst Black mothers. The current study explores the relationship between the maternal bond and depressive symptoms among Black mothers. The research questions this paper will explore is whether depressive symptoms are associated with maternal pre- and post-natal attachment scores. The study will investigate the relationship between maternal bonding and depressive symptoms and assess for the moderating impact of the variable traumatic loss. Based on the current literature, we hypothesize that depressive symptoms are negatively associated with maternal attachment scores, such that as depressive symptoms increase, maternal bonding will decrease. We also hypothesize that traumatic loss will demonstrate a positive moderating relationship between depressive symptoms and maternal bonding; as traumatic loss increases, maternal bonding decreases.

This study will contribute to the literature through its focus on Black maternal mental health and added insight into how maternal representations are influenced by depressive symptoms and how traumatic loss may affect the relationship between depressive symptoms and maternal bonding. This study centers Black mothers and treats them with respect and autonomy by examining how depressive symptoms impact the mother's experience of the maternal–infant bond rather than how maternal depression impacts the infant. This pilot study focuses on depressive symptoms and provides the foundation for continued and broader investigations examining the relationship between perinatal mental health, adverse perinatal outcomes, and maternal bonding. This secondary data analysis makes use of maternal depression data collected as part of a study focused on the role of Black fathers in maternal and infant health; future research should extend this analysis and incorporate attention to the full range of perinatal mood and anxiety disorders.

2 | METHOD

2.1 | Data and sample

The data for the current study comes from the Black Fathers, Equal Partners in Advancing Maternal and Infant Health Project, a collaboration between researchers at the University of Wisconsin Madison and the African American Breastfeeding Network. The mixed-methods project aimed to understand Black fathers' involvement in pregnancy and engage fathers in efforts to support Black maternal and infant health. Here, we use quantitative data from a needs assessment among Black expectant and new parents living within the Milwaukee, Wisconsin, metro area. Participants completed an online survey via Qualtrics. The survey took approximately 20–30 min to complete and participants were compensated $25. Both Black mothers ($n = 76$) and Black fathers ($n = 75$) participated in the survey component of the project. For the current analysis, which investigates the relationship between maternal depressive symptoms and maternal–infant bonding moderated by birth trauma, we use only survey data collected from mothers. All study procedures were approved by the university institutional review board.

Eligibility criteria for the study included identifying racially as Black/African American or Black Biracial; over the age of 18; currently pregnant or had given birth in the past 12 months; and resident of Milwaukee, Wisconsin. Approximately 70% of the study participants were aged 26–35 and were mothers of babies, while 35% of the sample were expectant mothers. Nearly 40% of participants stated that their highest level of education was a high school diploma/GED, and an additional 38% reported their highest educational attainment as completing some college or completing technical or trade school. Additional information about individual and family characteristics of the sample is provided in Table 1.

2.2 | Measures

2.2.1 | Maternal depression

We used the Patient Health Questionnaire-2 (PHQ-2) (PHQ-2; Kroenke et al., 2003) was used. Participants were asked, "Over the last 2 weeks, how often have you been bothered by the following problems?" and responded to the following two items: "Little interest or pleasure in doing things" and "Feeling down, depressed or hopeless." Both items were measured on a 4-point Likert scale where 0 = Not at all and 3 = Nearly every day. We calculated a total score from 0 to 6, with higher scores representing more depressive symptoms, then created a dichotomous variable wherein participants with a score of 0–2 was categorized as having normal to mild feelings of depression and participants with a score of 3 to 6 were categorized as having moderate to severe feelings of depression.

TABLE 1 Sociodemographic characteristics of participants.

Demographic characteristics	*n*	*%*
Age in years		
18–25	14	18.18
26–34	50	64.94
35–43	12	15.58
Mother of baby		
Yes	53	69.74
No	17	22.37
Mother of expectant baby		
Yes	36	35.53
No	27	47.37
Married to the father of the expectant baby		
Yes	10	15.15
Not currently married but plan of becoming married	12	21.21
Not married and do not plan on becoming married	14	18.18
Married to the father of the baby		
Yes	24	33.8
Not currently married but plan of becoming married	12	23.94
Not married and do not plan on becoming married	17	16.9
Highest educational attainment		
Advanced degree (e.g., Masters, PhD, JD, MD, etc.)	3	3.9
Completed a four-year college with a Bachelor's degree	12	15.58
Some college, or completed technical or trade school	29	37.66
Completed high school or GED	29	37.66
Some high school	4	5.19
Total household income		
More than $100,00	5	6.58
$75,000 to 99,000	9	11.84
$50,000 to $74,999	18	23.68
$25,000 to $49,999	20	26.32
Less than $24,999	24	31.58

2.2.2 | Maternal bonding

Expectant mothers' bond with their fetus and new mothers' bond with their baby was assessed using four items drawn from the Maternal Antenatal Attachment Scale (Condon, 2015a) or the Maternal Postnatal Attachment Scale (Condon, 2015b). These measures are focused on the mother's perceptions of the fetus and the infant, respectively. Items were selected in consultation with the Executive Director and Father Engagement Coordinator of the African American Breastfeeding Network, who advised on cultural resonance. Expectant mothers responded to items like, "Over the past two weeks, my feeling about the baby inside me has been:", where response options included very positive, mainly positive, mixed positive and negative, mainly negative, very negative. Mothers of babies responded to items like, "Over the last two weeks, I would describe my feelings for the baby as:", where response options included dislike, no strong feelings toward the baby, slight affection, moderate affection, intense affection. Items were scored on a 5-point Likert scale from 0 to 4, for a summed total of 0–16, with higher scores reflecting a greater maternal bond.

2.2.3 | Traumatic loss

We assessed traumatic loss using three questions, worded slightly differently for pregnant mothers and mothers of infants. The questions are as follows: "Prior to the baby you are currently expecting / Prior to your baby, have you experienced a pregnancy loss?" "Prior to the baby you are currently expecting / Prior to your baby, have you experienced the loss of an infant or child?" "Prior to the baby you are currently expecting / Prior to your baby, have you had any children admitted to the NICU (Neonatal Intensive Care Unit)?" All three questions were answered using a yes or no response. We created a categorical variable to represent the experience of traumatic loss, wherein if a participant responded "yes" to one or more of the three questions, they were categorized as having experienced birth trauma, and if a participant responded "no" to all three questions they were categorized as not having experienced birth trauma.

2.3 | Analytic approach

To examine the relationship between depressive symptoms and maternal bonding, bivariate and multivariate analyses were conducted. We conducted a bivariate analysis to assess the strength of the relationship between depressive symptoms and maternal bonding without confounding variables. Next, we conducted an Ordinary Least Squares regression analysis to better understand the relationship between maternal attachment scores and depression when traumatic loss was included. An OLS model was chosen rather than a logistic regression as a sample size of at least 10 is needed in each category (Schwab, 2002). The current sample size ($N = 76$), did not lend itself to having categories of at least 10, even when dichotomized. Therefore, an OLS regression method was employed utilizing dummy variables to create continuous data (Robitzsch, 2020).

3 | RESULTS

3.1 | Descriptive analysis

13.3% of participants had experienced one or more forms of birth trauma, which included prior infant NICU stay, prior miscarriage, and prior stillbirth. Approximately 30.26%

TABLE 2 Bivariate regression coefficients maternal attachment scores and depression scores.

Variable	*Model 1*		
	B	***β***	**SE**
Constant	13.371	–	.396
Depression	−.747	−.489	.154
R^2	.293	–	–

Note:$N = 76$. We examined the association between depression and maternal. Model 1 examines the association between depression and maternal (bonding) attachment scores. *$p < .001$.

of participants reported clinically significant depression symptoms, as assessed with the PHQ-2. The mean score of the PhQ-2 was roughly 2 with the minimum being 0 and the maximum score as 6. Finally, the mean reported maternal attachment score was 12.

3.2 | Model 1: Bivariate analysis

A bivariate regression was conducted to examine the relationship between depressive symptoms and maternal bonding. The regression model utilized scores from the Maternal Antenatal Attachment scale (for expectant mothers) or the Maternal Postnatal Attachment scale (for mothers of infants), and the PHQ-2 to establish the regression equation. A significance level of .10 was chosen due to sample size constraints, allowing for greater variability and inclusivity of results (Nyak, 2010). The bivariate regression analysis revealed a significant relationship between maternal bonding and depressive symptoms ($p < .001$). The Pearson Correlation coefficient of −.440 indicated a moderately negative relationship between maternal depression and bonding, suggesting that as depressive symptoms increase, the maternal bond decreases.

3.3 | Model 2: Multivariate analysis

An OLS regression was calculated to better understand the relationship between depressive symptoms and the maternal bond with the inclusion of the variable traumatic loss in this sample of Black mothers. The results suggest that the association between maternal bonding and depressive symptoms remained significant ($p < .001$), indicating no change in the significance of the relationship. In both the bivariate and multivariate analysis, the effect size remained the same ($R^2 = .293$). However, the directionality of the relationship changed when the moderating variable was included, as shown in Table 2. The directionality of the relationship in the bivariate analysis indicated that as depressive symptoms increased, maternal bonding decreased.

In Model 2, traumatic loss did not have a main effect on maternal bonding ($p = .521$), its inclusion as an interaction variable was significant ($p = .037$), suggesting that traumatic loss did have an overall impact on the relationship between depressive symptoms and the maternal bond. The relationship between Depressive symptoms and maternal bonding indicated ($B = -.589$), while the relationship between traumatic loss and the maternal bond was ($B = -.881$). Both of these results are similar to that of the bivariate analysis conducted prior. However, the interaction variable traumatic loss and depression when integrated within the OLS model was ($B = .847$).

4 | DISCUSSION

Pervasive patterns of racial discrimination impact Black women throughout the perinatal period. One of the major ways Black women are impacted during the perinatal period are through health disparities such as higher rates of maternal mortality, morbidity, and infant mortality. By looking into traumatic loss as a moderating effect within the association of depressive symptoms and the maternal–infant bond, it gives us a greater understanding of how these health disparities may impact the relationship between the mother and the infant. Within this research, we want to avoid the narrative that trauma has an overall negative impact on bonding. We argue that it is other factors that contribute to maternal functioning, and there is no justification for the continued mistreatment of Black women within the medical system.

The findings of this research are important because Black perinatal mental is all too often overlooked or ignored (Pappas, 2021). Stereotypes of Black women as strong perpetuate the view of Black women as caretakers, which is an impediment to giving adequate mental health care and is amplified when Black women become mothers (Pappas, 2021; Nash, 2021). Previous studies have examined the relationship between the maternal bond and maternal depression, demonstrating that depression may impede maternal–infant bonding. However, most prior literature has not focused on Black mothers or explored the interaction of traumatic loss as a moderating effect (Brake et al., 2020). This research is responsive to the call of numerous scholars for greater attention to Black mothers' perinatal mental health in research to inform strategies to further Black mothers' access to mental health services (Declerq et al., 2022; Estriplet et al., 2022). Looking at maternal bonding is not simply important for the mental health of the infant, as it may be an indicator of maternal mental health (emotional regulation) and has implications for the support that Black mothers may need for their own well-being (Brake et al., 2020). The mother-infant relationship

is an emotional exchange between the mother and the infant, such that how the mother interprets her infant's cues can generate emotional responses within the mother (Bornstein et al., 2012).

The study's results across both models indicated an association between depressive symptoms and the maternal–infant bond, which is consistent with prior literature (Alhusen et al., 2013; Brake et al., 2020; Bornstein et al., 2012; Flykt et al., 2010). Prior literature has discussed that the Black women in the United States experience higher levels of postpartum depression; however, they are less likely to receive postpartum mental health (Hoyert, 2022; Meekins, 2022). Moreover, when Black mothers experienced being upset by instances of racism during the perinatal period, Black mothers were at increased risk of experiencing postpartum depression (Weeks et al., 2022). In Model 1, consistent with prior literature, we see that as depressive symptoms intensify, maternal bonding lessens. The descriptive results showed most participants showed no to mild depressive symptoms, and most participants showed high attachment scores. These results, in conjunction with 69% of participants receiving prenatal support, also support prior literature that attests to the idea that mothers who receive prenatal support are more likely to experience higher levels of bonding (Turner & Davis, 2020).

In Model 2, when birth trauma was introduced as a moderating variable, results contradicted the original hypothesis. Within this model, the association between depressive symptoms and maternal bonding was consistent with the results above, indicating that as depressive symptoms strengthen, maternal bonding decreases. However, when the interaction variable depression*traumatic loss is accounted for in this model, we see that the direction of the effect changes such that an increase in depressive symptoms is associated with an increase in maternal bonding when moderated by birth trauma.

We speculate there may be underlying mechanisms such as resilience, one's ability to self-regulate, pre- and post-birth support (social, community resources, and professional), symbolism of the infant within the relationship after the birth trauma occurs that need to potentially be accounted for when the mother experiences birth trauma (prior NICU stay, prior miscarriage, and prior infant loss). Prior research conducted with Black women who endure consistent racism found that the regions of the brain that are responsible for emotion regulation have increased activity and were shown to operate continuously when traumatic events occur (Fani et al., 2021). The research alludes to the fact that this may have an overall impact on Black women's health, increasing the risk for various health conditions (Fani et al., 2021). Prior research leads us to speculate that the function of emotional regulation due to chronic experiences of racism may impact how Black mothers respond to perinatal traumatic loss. The hyperactivity of the parts of the brain that increase emotional regulation will also impact how the mother perceives her infants' cues (Fani et al., 2021; Turner & Davis, 2020). This result calls for more future research to better understand the influence of internal resources, community and professional support, and maternal representations of the infant on the relationship between depressive symptoms and attachment for Black women.

Another influence that is rarely talked about is the impact of how Black women are often placed in the superwoman schema; prior literature indicates stereotypes of Black women as strong caretakers and rescuers influence both how Black women are treated and cultural expectations of Black women (Thomas et al., 2022). The superwoman schema may play a role in how Black mothers function as a result of systemic racism. An alternative aspect that may influence the results of this study is a phenomenon known as "rainbow baby." Willets (2023) defines a rainbow baby as an infant that comes along after infant loss or prior miscarriage. This phenomenon can influence maternal representations of the infant (Lake, 2020; Willets, 2023). Prior research has theorized that infants born after prior miscarriage or stillbirth ("rainbow baby") offer profound hope for grieving parents (Turner & Davis, 2020). However, the process of bonding can be impacted (Lake, 2020; Turner & Davis, 2020; Willets, 2023). Women who have experienced loss in the perinatal period are at increased risk of developing anxiety, depression, or post-traumatic stress disorder after the subsequent birth (Gaudet, 2010; Ordóñez et al., 2018; Turner & Davis, 2020). Though mothers who have experienced prior traumatic loss are at higher risk, the literature cites two different processes that may be a buffer in preventing adverse bonding and account for whether the infant is perceived as the "rainbow baby." The first is the level of perinatal support through the grieving process (Turner & Davis, 2020). The second is how the mother perceives her interactions with the infant and what they may symbolize to her (Hunfeld et al., 1997; Turner & Davis, 2020; Turton et al., 2009). Future research is needed to explore more deeply this interaction for Black mothers and inform future perinatal mental health interventions.

4.1 | Clinical implications

Though the study indicates a change in the directionality of the relationship between depression and bonding when the interaction variable (birth trauma) is included, it is still important for service providers, researchers, and policymakers to garner more understanding of Black women's

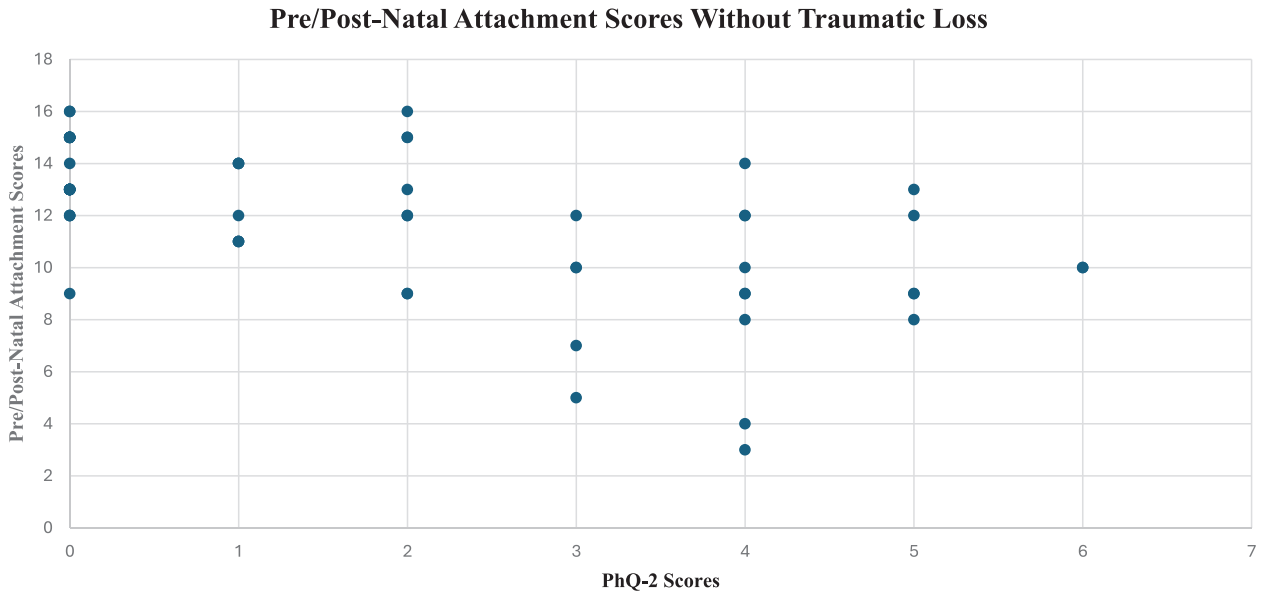

FIGURE 1 Distribution of Pre/Post-Natal Attachment Based on PHQ-2 Scores, Excluding Traumatic Loss.

TABLE 3 Multivariate regression coefficients maternal attachment scores and depression scores moderated by traumatic loss.

Variable	*Model 2*		
	B	***β***	**SE**
Constant	13.463	–	.442
Depression	−.589	−.576	.166
Traumatic Loss	−.881	−.086	.914
Traumatic Loss * Depression	.847	.293	.398
R^2	.293	–	–

Note:$N = 76$. We examined the association between depression and maternal attachment moderated by traumatic loss. Model 2 assesses the association of traumatic loss as a moderator. *$p < .001$.

mental during the perinatal period. It is important to dismantle the logic and structures behind racism to provide better and more comprehensive trauma-informed mental health care to Black mothers. The results of this study point toward the need for more comprehensive screening tools that are culturally responsive and trauma-informed (Patchen et al., 2024). Due to ongoing health disparities in the United States, Black mothers are more likely to have traumatic birthing experiences; therefore, trauma-informed practices that resist racism are critical in providing effective, equitable health, and mental health care (Patchen et al., 2024). The study also signals the need for infant mental health providers to spend time focusing on maternal grief and trauma processing through a strengths-based approach to help improve infant mental (Turner & Davis, 2020).

One critical form of mental health intervention is narrative therapy. When narrative therapy is integrated with Black feminist theoretical lenses, the infant mental health provider can both centralize the mother's experiences while simultaneously engaging her in the healing/grieving process (Brown, 2020; Turner & Davis, 2020). Using an intervention like narrative therapy in conjunction with culturally adapted models of facilitating attuned interactions or child-parent psychotherapy can combine trauma-informed mental health practices and help bridge the gap between maternal and infant mental health (Brown, 2020; Gilkerson & Imberger, 2016; Lieberman & Van Horn, 2011).

Moreover, this study has both policy and research implications. Policy changes are needed to target persistent health disparities that disadvantage Black women and infants (Estriplet et al., 2022), and more research is needed that centers the lived experiences and perspectives of Black mothers (Hill-Collins, 2022; Ross and Salinger, 2017). Better understanding the mechanisms at play, as researchers, policymakers, and mental health practitioners, can engage in early screening and intervention of depressive symptoms in Black mothers and can better understand risk factors that may contribute to this.

4.2 | Limitations and future directions

More research is needed to address Black maternal mental health. Though the current study offers important insight into the relationship between maternal bonding and depressive symptoms among Black mothers, future research should incorporate larger sample sizes, more expansive assessment of perinatal mood and anxiety disorders, posttraumatic stress disorder and posttraumatic growth, long form measures of pre- and postnatal

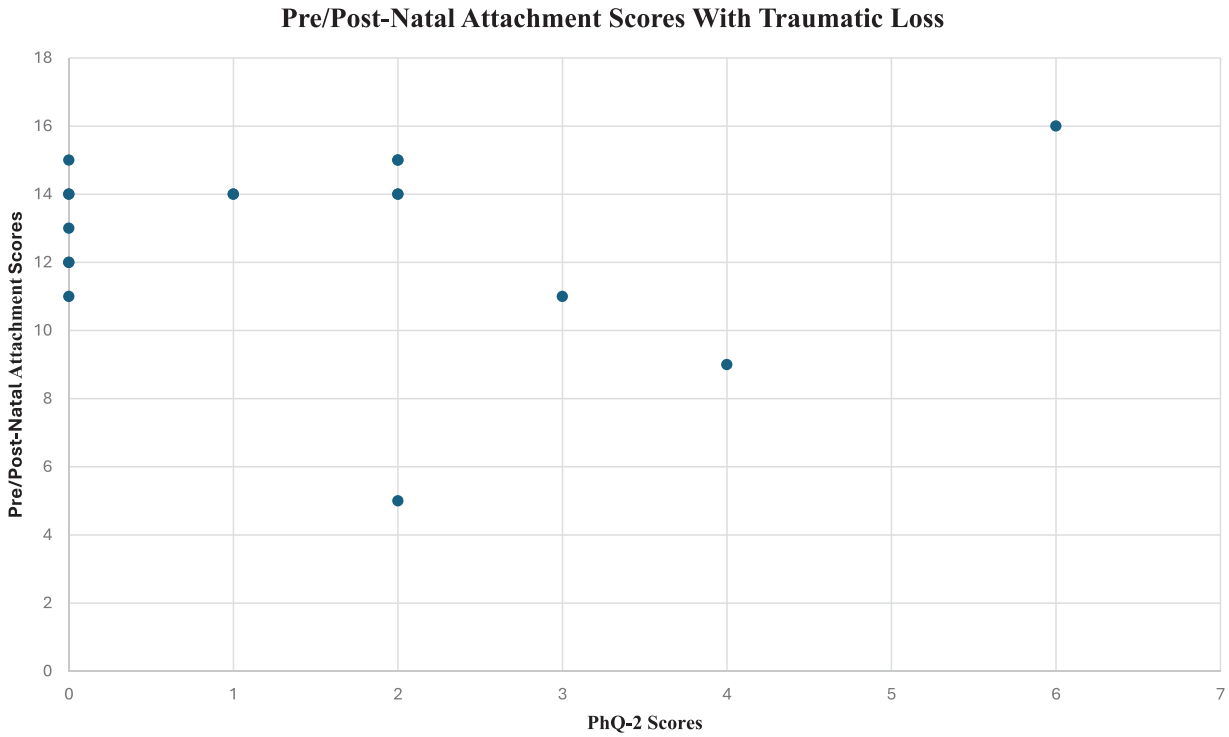

FIGURE 2 Distribution of Pre/Post-Natal Attachment Scores Based on PHQ-2 Scores and the Variable of Traumatic Loss.

attachment, and additional potential confounding variables in order to build on these results. Next, this pilot study combined pregnant and early-parenting mothers due to sample size constraints. In future research, these two groups need to be studied separately to explore potential differences in maternal bonding when pregnant as compared to early parenting. The sample in this study comes from a specific midwestern metropolitan area. Therefore, the results of this study may not generalize to other locales. More research is needed to better understand how birth trauma, depression, and pre- and post-natal attachment scores are related among Black mothers from across the United States. Another limitation of the study to be addressed in future research is the lack of cultural validation of the measurement instruments amongst Black women within the United States context. This is important because culture can influence one's internal representations (Floyd et al., 2023). Furthermore, qualitative research around this topic is also needed to deepen understanding and amplify the narratives of Black mothers who have experienced perinatal loss and to expand on our understanding of cultural interpretations of maternal–infant bonding.

5 | CONCLUSION

This study adds to a growing body of literature that discusses Black maternal mental health. Understanding how maternal depression interacts with maternal representations provides critical insights into a potential focus of perinatal mental health treatment. Better understanding the association between maternal bonding and depression in the context of birth trauma is a step toward identifying the ways in which health disparities in the United States impact not only maternal mental health but infant mental health. This study showed that maternal mental health can influence mothers' perceived connection with their fetus or baby, and birth trauma can impact that relationship profoundly, changing its direction. This study can be a catalyst for further research into the intersection of birth trauma with maternal mental health and bonding, paving the way for more culturally relevant dyadic maternal and infant mental health care. This research, alongside a growing body of literature, demonstrates the urgent need for policy change to advance robust and culturally centered mental health support for Black mothers and infants and reduce health disparities (Table 3 and Figure 1 and 2).

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data from this study is not available for public consumption due to the sensitive nature of this research study, and participants of this study did not give written consent for their data to be shared via public domains.

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REFERENCES

Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. N. (2015). *Patterns of attachment: A psychological study of the strange situation*. Psychology Press.

Alhusen, J. L., Hayat, M. J., & Gross, D. (2013). A longitudinal study of maternal attachment and infant developmental outcomes. *Archives of Womens Mental Health*, *16*, 521–529. https://doi.org/10.1007/s00737-013-0357-8

Antilla, J. M., & Johnson, T. S. (2024). Life stressors and mental well-being: Experiences of African American women navigating perinatal loss and pregnancy subsequent to loss. *Journal of Black Psychology*, *50*(3), 326–364. https://doi-org.ezproxy.library.wisc.edu/10.1177/00957984241230670

Bonilla-Silva, E. (2003). The central frames of color-blind racism. In *Racism without racists: Color-blind racism and the persistence of racial inequality in the United States (Second, pp. 25–52). essay*. Rowan & Littlefield Publishers, INC.

Bornstein, M. H., Suwalsky, J. T., & Breakstone, D. A. (2012). Emotional relationships between mothers and infants: Knowns, unknowns, and unknown unknowns. *Development and psychopathology*, *24*(1), 113–123. https://doi.org/10.1017/S0954579411000708

Bowlby, J. (2008). *Attachment*. Basic books.

Brake, E., Berle, D., Reilly, N. M., & Austin, M. (2020). The relationship between emotion dysregulation and postnatal attachment in women admitted to a mother baby unit. *Australian Journal of Psychology*, *72*(3), 283–292. https://doi.org/10.1111/ajpy.12289

Brandon, A. R., Pitts, S., Denton, W. H., Stringer, C. A., & Evans, H. M. (2009). A history of the theory of prenatal attachment. *Journal of Prenatal & Perinatal Psychology & Health*, *23*(4), 201–222.

Bronfenbrenner, U. (1992). Ecological systems theory. In R. Vasta (Ed.), *Six theories of child development: Revised formulations and current issues* (pp. 187–249). Jessica Kingsley Publishers.

Brown, C. (2020). Feminist narrative therapy and complex trauma: Critical clinical work with women diagnosed as "borderline". In C. Brown & J. E. MacDonald (Eds.), *Critical clinical social work: Counterstorying for social justice* (82–109).

Choi, C., Mersky, J. P., Janczewski, C. E., & Goyal, D. (2022). Advancing research on perinatal depression trajectories: Evidence from a longitudinal study of low-income women. *Journal of Affective Disorders*, *301*, 44–51. https://doi.org/10.1016/j.jad.2022.01.026

Collins, P. H. (2022). *Black feminist thought: Knowledge, consciousness, and the politics of empowerment*. Routledge.

Condon, J. T. (1993). The assessment of antenatal emotional attachment: Development of a questionnaire instrument. *The British Journal of Medical Psychology*, *66*(Pt2), 167–183. https://doi.org/10.1111/j.2044-8341.1993.tb01739.x

Condon, J. T. (2015a). *Maternal antenatal attachment scale [measurement instrument]*.

Condon, J. T. (2015b). *Maternal postnatal attachment scale [measurement instrument]*.

Condon, J. T., & Corkindale, C. J. (1998). The assessment of parent-to-infant attachment: Development of a self-report questionnaire instrument. *Journal of Reproductive and Infant Psychology*, *16*(1), 57–76.

Cook, N., Ayers, S., & Horsch, A. (2018). Maternal posttraumatic stress disorder during the perinatal period and child outcomes: A systematic review. *Journal of affective disorders*, *225*, 18–31. https://doi.org/10.1016/j.jad.2017.07.045

Datto, A., (Retrieved April 15, 2023). *Social determinants of health*. World Health Organization.

Declercq, E., Feinberg, E., & Belanoff, C. (2022). Racial inequities in the course of treating perinatal mental health challenges: Results from listening to mothers in California. *Birth (Berkeley, Calif.)*, *49*(1), 132–140. https://doi.org/10.1111/birt.1258

Denzin, N. (2023, November 7). *Wisconsin's racial disparities in maternal, infant mortality*. PBS Wisconsin. https://pbswisconsin.org/news-item/wisconsins-racial-disparities-in-maternal-infant-mortality/

Di Florio, A., Putnam, K., Altemus, M., Apter, G., Bergink, V., Bilszta, J., Brock, R., Buist, A., Deligiannidis, K. M., Devouche, E., Epperson, C. N., Guille, C., Kim, D., Lichtenstein, P., Magnusson, P. K., Martinez, P., Munk-Olsen, T., Newport, J., Payne, J., … Meltzer-Brody, S. (2017). The impact of education, country, race and ethnicity on the self-report of postpartum depression using the Edinburgh postnatal depression scale. *Psychological Medicine*, *47*(5), 787–799. https://doi.org/10.1017/S0033291716002087

Erickson, N., Julian, M., & Muzik, M. (2019). Perinatal depression, PTSD, and trauma: Impact on mother-infant attachment and interventions to mitigate the transmission of risk. *International review of psychiatry (Abingdon, England)*, *31*(3), 245–263. https://doi-org.ezproxy.library.wisc.edu/10.1080/09540261.2018.1563529

Estriplet, T., Morgan, I., Davis, K., Crear Perry, J., & Matthews, K. (2022). Black perinatal mental health: Prioritizing maternal mental health to optimize infant health and wellness. *Frontiers in Psychiatry*, *13*, 807235. https://doi.org/10.3389/fpsyt.2022.807235

Fani, N., Carter, S. E., Harnett, N. G., Ressler, K. J., & Bradley, B. (2021). Association of racial discrimination with neural response to threat in black women in the US exposed to trauma. *JAMA Psychiatry*, *78*(9), 1005–1012. https://doi.org/10.1001/jamapsychiatry.2021.1480

Fearon, R. P., & Roisman, G. I. (2017). Attachment theory: Progress and future directions. *Current Opinion in Psychology*, *15*, 131–136.

Floyd James, K., Smith, B. E., Robinson, M. N., Thomas Tobin, C. S., Bulles, K. F., & Barkin, J. L. (2023). Factors associated with postpartum maternal functioning in Black women: A secondary analysis. *Journal of Clinical Medicine*, *12*(2), 647. https://doi.org/10.3390/jcm12020647

Flykt, M., Kanninen, K., Sinkkonen, J., & Punamäki, R.-L. (2010). Maternal depression and dyadic interaction: The role of maternal attachment style. *Infant and Child Development*, *19*(5), 530–550.

Gaudet, C. (2010). Pregnancy after perinatal loss: Association of grief, anxiety and attachment. *Journal of Reproductive and*

Infant Psychology, *23*(3), 240–251. https://doi.org/10.1080/02646830903487342

Gilkerson, L., & Imberger, J. (2016). Strengthening reflective capacity in skilled home visitors. *Zero to Three*, *37*(2), 8.

Goodman, S. H., Rouse, M. H., Connell, A. M., Broth, M. R., Hall, C. M., & Heyward, D. (2011). Maternal depression and child psychopathology: A meta-analytic review. *Clinical Child and Family Psychology Review*, *14*(1), 1–27. https://doi.org/10.1007/s10567-010-0080-1

Goyal, D., Gay, C., & Lee, K. A. (2010). How much does low socioeconomic status increase the risk of prenatal and postpartum depressive symptoms in first-time mothers? *Women's Health Issues: Official Publication of the Jacobs Institute of Women's Health*, *20*(2), 96–104. https://doi.org/10.1016/j.whi.2009.11.003

Halligan, S. L., Murray, L., Martins, C., & Cooper, P. J. (2007). Maternal depression and psychiatric outcomes in adolescent offspring: A 13-year longitudinal study. *Journal of Affective Disorders*, *97*(1-3), 145–154. https://doi.org/10.1016/j.jad.2006.06.010

Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology*, *52*(3), 511.

Hernandez, N. D., Dorsey, J., Glass, D. M., Pope, E., Worthy, N., Blasingame, E., Gooding, J., Braxton, P., Whitfield, M., & Dotson, Y. (2019). Community-engaged approaches to address the ethical concerns of maternal mental health disparities research. *Journal of Health Care for the Poor and Underserved*, *30*(5), 12–20. https://doi.org/10.1353/hpu.2019.0110

Hoyert, D. (2022). *Maternal Mortality Rates in the United States, 2020*. https://doi.org/10.15620/cdc:113967

Hunfeld, J. A. M., Taselaar-Kloos, A. K. G., Agterberg, G., Wladiniroff, J. W., & Passchier, J. (1997). Trait anxiety, negative emotions, and the mothers' adaptation to an infant born subsequent to late pregnancy loss: A case-control study. *Prenatal Diagnosis*, *17*(9), 843–851.

Kolk, T. A., Nath, S., Howard, L. M., Pawlby, S., Lockwood-Estrin, G., & Trevillion, K. (2021). The association between maternal lifetime interpersonal trauma experience and perceived mother-infant bonding. *Journal of Affective Disorders*, *294*, 117–127. https://doi.org/10.1016/j.jad.2021.06.069

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2003). The Patient Health Questionnaire-2: Validity of a two-item depression screener. *Medical Care*, *41*(11), 1284–1292. https://doi.org/10.1097/01.MLR.0000093487.78664.3C

Kroenke, K., Spitzer, R. L., Williams, J. B., Monahan, P. O., & Löwe, B. (2007). Anxiety disorders in primary care: Prevalence, impairment, comorbidity, and detection. *Annals of Internal Medicine*, *146*(5), 317–325. https://doi.org/10.7326/0003-4819-146-5-200703060-00004

Lachman, A., Jordaan, E. R., Stern, M., Donald, K. A., Hoffman, N., Lake, M. T., Zar, H. J., Niehaus, D. J. H., Puura, K., & Stein, D. J. (2022). The shared pleasure paradigm: A study in an observational birth cohort in South Africa. *Archives of Women's Mental Health*, *25*(1), 227–235. https://doi.org/10.1007/s00737-021-01199-0

Lake, D. (2020). The brightest rainbow follows the darkest storm. *Children (Basel, Switzerland)*, *7*(11), 223. https://doi.org/10.3390/children7110223

Lieberman, A. F., & Van Horn, P. (2011). *Psychotherapy with infants and young children: Repairing the effects of stress and trauma on early attachment*. Guilford Press.

Lindgren, K. (2001). Relationships among maternal-fetal attachment, prenatal depression, and health practices in pregnancy. *Research in Nursing & Health*, *24*(3), 203–217. https://doi.org/10.1002/nur.1023

MarchofDimes. (2023). *2023 March of dimes report card for Wisconsin*. March of Dimes | PeriStats. https://www.marchofdimes.org/peristats/reports/wisconsin/report-card

Matthews, K., Morgan, I., Davis, K., Estriplet, T., Perez, S., & Crear-Perry, J. A. (2021). Pathways to equitable and antiracist maternal mental health care: Insights from black women stakeholders: Study examines pathways to equitable and antiracist maternal mental health care. *Health Affairs*, *40*(10), 1597–1604.

Meekins, C. (2022, July 19). *Supporting Black Women's Maternal Mental Health Journey*. American Hospital Association for Diversity and Health.

Muijs, D. (2011). *Doing quantitative research in education with SPSS*. SAGE Publications Ltd. https://doi.org/10.4135/9781446287989

Muller, M. E. (1989). *The development and testing of the Müller Prenatal Attachment Inventory*. University of California.

Nash, J. C. (2021). *Birthing Black mothers*. Duke University Press.

Nasiriavanaki, Z., Barbour, T., Farabaugh, A. H., Fava, M., Holmes, A. J., Tootell, R. B. H., & Holt, D. J (2021). Anxious attachment is associated with heightened responsivity of a parietofrontal cortical network that monitors peri-personal space. *NeuroImage: Clinical*, *30*, 1–11. https://doi.org/10.1016/j.nicl.2021.102585

Nayak, B. K. (2010). Understanding the relevance of sample size calculation. *Indian Journal of Ophthalmology*, *58*(6), 469–470. https://doi.org/10.4103/0301-4738.71673

Olivier, E., & Murph, B. (2024, February 26). *Navigating the Labyrinth of Healthcare Disparities–A Personal Story by Erica Olivier*. City of Milwaukee. https://city.milwaukee.gov/Health/News-and-Events/Blog/Navigating-the-Labyrinth-of-Healthcare-Disparities–A-Personal-Story-by-Erica-Olivier

Ordóñez, E. F., Díaz, C. R., Gil, I. M. M., & Manzanares, M. T. L. (2018). Post-traumatic stress and related symptoms in a gestation after a gestational loss: Narrative review. *Salud Mental*, *41*(5), 237–243. https://dx.doi.org/10.17711/SM.0185-3325.2018.035

Pappas, S. (2021, November 1). *Effective therapy with black women*. Monitor on Psychology. Retrieved April 15, 2023, from https://www.apa.org/monitor/2021/11/ce-therapy-black-women

Parker, A. (2021). Reframing the narrative: Black maternal mental health and culturally meaningful support for wellness. *Infant Mental Health Journal*, *42*, 502–516. https://doi-org.ezproxy.library.wisc.edu/10.1002/imhj.21910

Patchen, L., McCullers, A., Beach, C., Browning, M., Porter, S., Danielson, A., Asegieme, E., Richardson, S. R., Jost, A., Jensen, C. S., & Ahmed, N. (2024). Safe babies, safe moms: A multifaceted, trauma informed care initiative. *Maternal and Child Health Journal*, *28*(1), 31–37. https://doi.org/10.1007/s10995-023-03840-z

Patient health questionnaire-2 (PHQ-2). National HIV Curriculum. (n.d.). Retrieved April 8, 2023, from https://www.hiv.uw.edu/page/mental-health-screening/phq-2

Raval, V., Goldberg, S., Atkinson, L., Benoit, D., Myhal, N., Poulton, L., & Zwiers, M. (2001). Maternal attachment, maternal responsiveness and infant attachment. *Infant Behavior and Development*, *24*(3), 281–304.

Roberts, D. (1997). *Killing the Black body: Race, reproduction, and the meaning of liberty*. Penguin Random House LLC..

Robitzsch, A. (2020, October). Why ordinal variables can (almost) always be treated as continuous variables: Clarifying assumptions of robust continuous and ordinal factor analysis estimation methods. In *Frontiers in education*. Frontiers Media SA.

Rosenblum, K., Lawler, J., Alfafara, E., Miller, N., Schuster, M., & Muzik, M. (2018). Improving maternal representations in high-risk mothers: A randomized, controlled trial of the mom power parenting intervention. *Child Psychiatry and Human Development*, *49*(3), 372–384. https://doi.org/10.1007/s10578-017-0757-5

Ross, L., & Solinger, R. (2017). *Reproductive justice: An introduction* (Vol. 1). Univ of California Press.

Saltelli, A., & Marivoet, J. (1990). Non-parametric statistics in sensitivity analysis for model output: A comparison of selected techniques. *Reliability Engineering & System Safety*, *28*(2), 229–253.

Schwab, J. A. (2002). Multinomial logistic regression: Basic relationships and complete problems. http://www.utexas.edu/courses/schwab/sw388r7/SolvingProblems/

Slade, A., Belsky, J., Aber, J. L., & Phelps, J. L. (1999). Mothers' representations of their relationships with their toddlers: Links to adult attachment and observed mothering. *Developmental Psychology*, *35*(3), 611.

Smeeding, T. M., & Thornton, K. (2018, September 20). Poverty, incomes, race and ethnicity in Wisconsin and Milwaukee: supplement to the 2016 Wisconsin poverty report. https://www.irp.wisc.edu/

Stern, D. N. (1995). *The motherhood constellation: A unified view of parent–infant psychotherapy*. Basic Books.

Tambelli, R., Cimino, S., Cerniglia, L., & Ballarotto, G. (2015). Early maternal relational traumatic experiences and psychopathological symptoms: A longitudinal study on mother-infant and father-infant interactions. *Scientific Reports*, *5*, 13984. https://doi.org/10.1038/srep13984

Thabane, L., Mbuagbaw, L., Zhang, S., Samaan, Z., Marcucci, M., Ye, C., Thabane, M., Giangregorio, L., Dennis, B., Kosa, D., Borg Debono, V., Dillenburg, R., Fruci, V., Bawor, M., Lee, J., Wells, G., & Goldsmith, C. H. (2013). A tutorial on sensitivity analyses in clinical trials: The what, why, when and how. *BMC Medical Research Methodology*, *13*, 92. https://doi.org/10.1186/1471-2288-13-92

Thomas, Z., Banks, J., Eaton, A. A., & Ward, L. M. (2022). 25 years of psychology research on the "strong black woman. *Social and Personality Psychology Compass*, *16*(9), e12705. https://doi.org/10.1111/spc3.12705

Trapolini, T., Ungerer, J. A., & McMahon, C. A. (2008). Maternal depression: Relations with maternal caregiving representations and emotional availability during the preschool years. *Attachment & Human Development*, *10*(1), 73–90.

Turner, R., & Villarreal-Davis, C. (2020). Hope after the storm: Addressing the impact of perinatal grief on attachment with rainbow babies through an embodied grief process. In J. A. Courtney (Ed.), *Infant play therapy: Foundations, models, programs, and practice* (pp. 230–243). Routledge/Taylor & Francis Group. https://doi.org/10.4324/9780429453083-16

Turton, P., Badenhorst, W., Pawlby, S., White, S., & Hughes, P. (2009). Psychological vulnerability in children next-born after stillbirth: Case-control follow-up study. *Journal of Child Psychology and Psychiatry*, *50*(12), 1451–1458. https://doi.org/10.1111/j.1469-7610.2009.02111.x

van IJzendoorn, M. H., Juffer, F., & Duyvesteyn, M. G. (1995). Breaking the intergenerational cycle of insecure attachment: A review of the effects of attachment-based interventions on maternal sensitivity and infant security. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *36*(2), 225–248. https://doi.org/10.1111/j.1469-7610.1995.tb01822.x

Vinick, G. (2022, December 6). *Racial, ethnic disparities in maternal and infant health outcomes remain wide in Wisconsin*. WPR. https://www.wpr.org/health/racial-disparities-maternal-infant-health-preterm-birth-rate-wisconsin-march-of-dimes

Weeks, F., Zapata, J., Rohan, A., & Green, T. (2022). Are experiences of racial discrimination associated with postpartum depressive symptoms? A multistate analysis of pregnancy risk assessment monitoring system data. *Journal of Women's Health (2002)*, *31*(2), 158–166. https://doi.org/10.1089/jwh.2021.0426

Willets, M. (2023, October 30). *What to know about having a rainbow baby, from parents who have been through it*. What to Know About Having a Rainbow Baby. https://www.parents.com/baby/what-it-means-to-be-a-rainbow-baby-and-why-rainbow-babies-are-beautiful/

Wisconsin department of health services Maternal and child health, 2016-17 Wisconsin Maternal Mortality Report. (2022). Wisconsin Department of Health Services.

Wojcik, M. (2021, April 15). *With Wisconsin disparities in mind, researchers and advocates reimagine health care for Black Mothers*. PBS Wisconsin. https://pbswisconsin.org/news-item/with-wisconsin-disparities-in-mind-researchers-and-advocates-reimagine-health-care-for-black-mothers/

Woods-Giscombe, C., Robinson, M. N., Carthon, D., Devane-Johnson, S., & Corbie-Smith, G. (2016). Superwoman schema, stigma, spirituality, and culturally sensitive providers: Factors influencing african american women's use of mental health services. *Journal of Best Practices in Health Professions Diversity: Research, Education and Policy*, *9*(1), 1124–1144.

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