Adverse Childhood Experiences, Postpartum Health, and Breastfeeding: A Mixed Methods Study

Dissertation

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By

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Abstract

Postpartum depression and anxiety (PPD/A) represent the most common side effects of childbirth. In addition to distress, mothers' with untreated PPD/A are more likely to have poorer breastfeeding outcomes and worse postpartum physical health. For women who have had adverse childhood experiences (ACEs)—most frequently identified as abuse, neglect, and household instability—the transition to motherhood may be fraught with particularly challenging cognitive and emotional responses frequently labeled as PPD/A. A few recent studies have demonstrated a link between ACEs and postpartum mental health. This dissertation—via a two-phase, explanatory sequential mixed methods design—makes a novel contribution to the perinatal mental health field by utilizing a combination of life course theory and the liberation health social work model to examine the association between a broad range of adverse childhood experiences (ACEs) and four interrelated outcomes—PPD/A, postpartum physical health, and breastfeeding challenges—and whether or not the variables of social support, experiences of discrimination, and material (economic) hardship influence this association.

In phase I, a fairly diverse sample of United States' mothers age 18 and older who delivered a live baby within the previous year ($N = 306$) completed an online survey on (a) ACEs (including the original 10 core questions as well as childhood experiences of discrimination, community violence, forced migration, and economic hardship); (b)

depression (Edinburgh Postnatal Depression Scale); (c) anxiety (Perinatal Anxiety Screening Scale); (d) experiences of discrimination (Everyday Discrimination Scale); (e) social support (Multidimensional Scale of Perceived Social Support), (f) material hardship; and (g) demographics, childbirth, breastfeeding, and self-rated postpartum physical health. In phase II, a strategically selected and diverse (i.e., age, income, race, and ethnicity) subset of participants (n = 22) with ACEs scores of 4 or greater—half who experienced 3 – 4 negative outcomes (PPD/A, poor postpartum physical health, and/or breastfeeding challenges) and half who experienced 0 – 1 negative outcomes—participated in semi-structured, individual telephone interviews to elicit insights into potential risk and protective factors that may have influenced postpartum outcomes. Participants were incentivized for partaking in both phases of the study.

Multiple linear regression was performed to examine the association between ACEs and PPD/A. Logistic regression tested the association between ACEs and postpartum physical health and breastfeeding challenges. Binomial regression was used to assess for associations between ACEs and the total number of breastfeeding challenges reported. Further, interaction terms were created using ACEs and each potential moderator variable (i.e., social support, material hardship, and experiences of discrimination) and entered into the regression models to assess for interaction effects. A codebook was developed and the author and a co-coder independently analyzed the data. Thematic analysis—using initial, axial, and theoretical coding—and coder consensus were employed to identify the final four themes of the data: (a) social support; (b) economic factors; (c) work-related

factors; and (d) self-care. Phase I and II results were integrated, summarized, and presented using a joint display of the results.

Mothers who reported higher perceived social support and who did not experience ACEs, discrimination, or material hardship fared better postpartum. The associations were statistically significant between ACEs and postpartum physical health and ACEs and the amount of breastfeeding challenges reported. However, for PPD/A, the effect of ACEs disappeared when all variables of interest were added to the regression model. Material hardship was a significant predictor of all four outcomes and moderated the associations between ACEs and postpartum physical health and ACEs and the number of breastfeeding challenges experienced. Results demonstrated significant associations between experiences of discrimination, material hardship, inadequate social support, and PPD/A. Findings were further endorsed by interview data which also illuminated mothers' desire for an improved work-life balance and time and support for self-care. Despite the commonality of adverse postpartum outcomes, the majority of women do not seek help with their postpartum struggles. Together, study results emphasize the need to focus on preventing ACEs and attending to modifiable factors (e.g., social support, economic hardship, discrimination) in order to reduce health disparities and improve maternal health and related outcomes.

Dedication

Dear Shane and Kaeden: Thank you for loving me, making me a mother, and for encouraging me to pursue my PhD. I love you both more than you could ever know.

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I have many people and groups to thank for supporting me in successfully completing this dissertation and earning my PhD. I hope I have not forgotten anyone (and if I did, I hope they never read this). An African proverb reads, “It takes a village to raise a child.” This is true, just as it takes a village to raise healthy and happy mothers—and successful PhD students. I am so grateful for my village.

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Vita

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Fields of Study

Major Field: Social Work

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Chapter 1. Introduction

Background and Problem Statement

Postpartum health is not a well-defined term, but generally refers to women's physical and mental health symptomatology and status after childbirth or the cessation of pregnancy. Most often, the medical field considers the postpartum period to be the first six to eight weeks after delivery. Increasingly, however, researchers and other experts consider women to be postpartum for the first 12 months after birth (Berens, Lockwood, & Eckler, 2017).

Postpartum health is an understudied area of research (Hsu, & Wickrama, 2018). While little is known about experiences of postpartum physical health outside of expected physical symptoms, morbidity, and mortality resulting from labor and delivery, research shows postpartum depression (PPD) and postpartum anxiety (PPA) are the most common side effects of childbirth (Wisner et al., 2013), affecting at least 15% of mothers (Gaynes et al., 2005; Paul, Downs, Schaefer, Beiler, & Weisman, 2013). In addition, successful breastfeeding—defined as feeding a child from one's breasts for as long as desired, without experiencing difficulties or pain—is known to protect against PPD, PPA, and various physical health conditions (Kendall-Tackett, 2007; Stuebe, 2009). However, breastfeeding without difficulty is elusive for more than half of mothers in the United States (US) (Odom, Li, Scanlon, Perrine, & Grummer-Strawn, 2013).

Postpartum physical health, mental health, and breastfeeding experiences are often interrelated and affect the well-being of mothers, their families, and larger society. Postpartum physical health and mental health problems have been associated with poor overall well-being, challenges related to self-care and childcare, (Ansara, Cohen, Gallop, Kung, & Schei, 2005), self-harm ideation (Wisner et. al., 2013), relationship difficulties (Letourneau et al., 2012; Whisman, Davila, & Goodman, 2011), children's developmental problems (Beck, 1998; Gress-Smith, Leucken, Lemery-Chalfant, & Howe, 2012), and increased reliance on social welfare because of an inability to work (Sontag-Padilla et al., 2013). Additionally, not breastfeeding has been linked to children's increased risk of infectious disease, cancer, diabetes, and sudden infant death syndrome, as well as maternal depression and anxiety, diabetes, and breast and reproductive cancers (Stuebe, 2009).

Moreover, a consideration of social determinants of health alerts to the fact that low-income women and women of color are among the groups disproportionately at risk for poor postpartum related outcomes. Higher rates of postpartum physical health problems and chronic illness have been documented among African American women and low-income women (Aziz et al., 2019; Misra, Grason, & Weisman, 2000). Poorer postpartum mental health has also been found among these groups (Gress-Smith et al., 2012; Rich-Edwards et al., 2006).

Another noteworthy variable affecting postpartum outcomes is mothers' adverse childhood experiences (ACEs). ACEs refer to potentially traumatic events, such as neglect, abuse, and other major stressors experienced prior to the age of 18 and have been

implicated in various negative adult behaviors (e.g., smoking and lack of exercise) and health and mental health conditions, such as depression, heart disease, cancer, asthma, diabetes, and autoimmune conditions (Felitti et al., 1998). Recent research has found that women who experienced ACEs, particularly childhood abuse and neglect, were more likely to go onto experience PPD and PPA (Choi et al., 2018; Mersky & Janczewski, 2018) than women who did not report having experienced ACEs. Additionally, lower socioeconomic status (SES) has been linked to both ACEs and PPD (Goyal, Gay, & Lee, 2010; Steele et al., 2016). Research connecting ACEs and postpartum outcomes, however, is in its infancy and needs increased attention.

Rationale and Significance of the Current Study

While a few recent studies have demonstrated a link between (a) ACEs and poor postpartum mental health (see Choi et al, 2018; Choi, & Sikkema, 2016; Mersky & Janczewski, 2018); and (b) ACEs and reduced duration of exclusive breastfeeding (Ukah, Adu, De Silva & von Dadelszen, 2016), no literature could be found regarding a link between ACEs and postpartum physical health. Moreover, most existing studies have not used the ACEs study questionnaires and have focused on child maltreatment alone. In contrast, a broader view of ACEs (including experiences of forced migration, community violence, discrimination, and financial instability) can provide increased understanding of the prospective importance of community and environmental factors influencing outcomes.

Further, associations between ACEs, and four outcomes of interest: PPD, PPA, postpartum physical health, and breastfeeding have not been simultaneously examined.

Nor has the association between ACEs and each outcome been studied while considering the role of social support, material hardship, and discrimination as three potential moderating factors. For this dissertation, social support refers to the level of mothers' perceived emotional and practical assistance received or available from friends, family, and/or a significant other. Material hardship represents mothers' ability to meet her and her family's basic needs within the previous 12 months in terms of food, shelter, utilities, and medical care. Finally, discrimination assesses the frequency in which mothers report experiencing maltreatment due to an aspect of their personal identity (e.g., gender, race, religion, sexual orientation, etc.).

Potential moderating variables of social support, experiences of discrimination, and material hardship were chosen for examination because they have been associated with health, mental health, and postpartum outcomes in the literature (see Aktan, 2012; Rosenthal et al., 2015; Tucker, Grzywacz, Leng, Randall Clinch, & Arcury, 2010) and represent noteworthy experiences and events that can significantly alter the life course. Additionally, a recent study showed that high social support during pregnancy served as a buffer against the negative effects of high ACEs scores on childbirth health risk scores (Racine et al., 2018). But, the association between ACEs and social support has not been assessed specific to the postpartum period. ACEs have also been associated with later homelessness, unemployment, lower socioeconomic status and socioeconomic disparities (Cruz & Woelk, 2019). Discrimination and material hardship are two examples of ACEs assessed in some of the expanded ACEs questionnaires and may be more representative adversity assessments for lower-income and racially minoritized populations; experiences

of these particular ACEs have also associated with poorer health and health behaviors (Cronholm et al., 2015). As a result of this information, it is anticipated that ACEs may lead to or be associated with lower social support, discrimination, and material hardship and that postpartum outcomes would be worse for mothers who experienced ACEs in combination with inadequate social support, discrimination, and/or material hardship.

Social support, experiences of discrimination, and material hardship also symbolize potentially modifiable mezzo- and macro- level factors that can be targeted to prevent and improve health and well-being. Activities aimed at changing mid-range and larger systems can help more women at once and can help prevent poorer outcomes. Thus, it is important to understand the role of each variable, as well as potential interactions between each variable and ACEs and how they influence postpartum outcomes.

This study makes an additional contribution to the literature by examining the relationships between variables using mixed methods. Both quantitative and qualitative data were collected to investigate potential associations between ACEs and the often interrelated outcomes of PPD, PPA, postpartum physical health, and breastfeeding challenges (any difficulties that prevented mothers from achieving their personal breastfeeding goals), along with the influence of three moderating variables: social support, experiences of discrimination, and material hardship. Mixed methods study results can be used to provide an enhanced understanding of the relationships among these variables as well as possible risk and protective factors influencing the association between ACEs and postpartum outcomes.

Since most adults have had at least one ACE (Felitti et al., 1998), and because postpartum health outcomes are underreported and most women diagnosed with PPD never receive treatment (Marcus, 2009; Wisner et al., 2013), it is prudent to focus on prevention. Efforts must be guided by an increased understanding of the interconnection between ACEs, other social determinants of health, and postpartum health, mental health, and breastfeeding outcomes. Related findings can be used to design mezzo- and macro-level interventions, programs, and policies to prevent and ameliorate PPD, PPA, poor postpartum health, and breastfeeding challenges—significant causes of individual, familial, and public health burdens. By generating new knowledge specific to the relationships between these variables among a diverse population of women, this study contributes toward the goal of reducing healthcare disparities and closing the health gap, one of the Grand Challenges for Social Work identified by the American Academy of Social Work and Social Welfare (AASWSW, 2018).

Theoretical Foundations

A combination of two theoretical perspectives—life course theory and liberation health social work—informed the conceptualization of this dissertation study. This allowed for a holistic approach to exploring potential associations between ACEs and postpartum health and breastfeeding, as well as how moderating variables of social support, discrimination, and material hardship further influenced outcomes. Each theoretical perspective has mutually supportive and overlapping components and are described individually below.

Life Course Theory

Life course theory first emerged approximately 50 years ago as a way to explain how the interrelationships between life events, chronological age, developmental stages and transitions, and life choices occur within social, cultural, and historical contexts, affecting individuals' life trajectories and later outcomes (Elder, Johnson, & Crosnoe, 2003; Hutchinson, 2011). Life course theory takes a multidisciplinary approach to recognizing that individuals' lives, events, experiences and roles do not necessarily occur in a prescribed, sequential pattern, but are the consequences of individuals' cumulative life experiences and opportunities over time; this is in opposition to life cycle and life span approaches which tend to focus on individuals' chronological and sequential development and experiences in a linear way (Giele & Elder, 1998). Further, the life course is thought to be affected via latent, pathway, and cumulative effects (Arcaya, Arcaya, & Subramanian, 2015).

Latent effects can influence later health via stressful or negative exposures experienced during key critical developmental periods in utero or early in life (e.g., ACEs), regardless of subsequent life events (Arcaya et al., 2015; Glymour, Avendano, & Kawachi, 2014). Pathway effects refer to health outcomes related to early negative experiences, decision-making and behaviors that tend to reinforce the likelihood of future negative experiences and behaviors throughout the life course (Arcaya et al., 2015; Glymour et al, 2014). Pathway effects may suggest that poverty and material hardship in childhood is problematic because it greatly increases the likelihood of poverty and material hardship in adulthood. Finally, cumulative effects occur because chronic or long-term negative events and exposures lead to ever-increasing, compounded health

risks (Glymour et al., 2014). For example, a longitudinal study of the effects of discrimination on breast cancer demonstrated that Black women who experienced frequent racial discrimination had higher incidence rates of breast cancer than Black women who reported experiencing discrimination less frequently and in fewer social contexts (Taylor, et al., 2007).

Thus, this study applies life course theory to better understand the potential latent, pathway, and cumulative associations between life events and circumstances in childhood (e.g., ACEs), as well as those that may occur in adulthood (e.g., experiences of poor social support, discrimination, and material hardship) and later poor postpartum health and breastfeeding experiences. While ACEs can put individuals at increased risk for poor health related outcomes, research suggests that these three additional variables may provide protection or further vulnerability as individuals' age. For example, mothers' satisfaction with their social support network has been repeatedly associated with more positive physical and mental health postpartum (Aktan, 2012; Hung & Chung, 2001; Razurel, Kaiser, Sellenet, & Epiney, 2013; Webster, Nicholas, Velacott, Cridland, & Fawcett, 2011). Additionally, positive social support has been linked with increased breastfeeding initiation and duration (Barona-Vilar, Escribá-Agüir, & Ferrero-Gandía, 2009). Furthermore, social support has emerged as a powerful, protective moderating variable in various studies examining the influence of discrimination on physical and mental health outcomes broadly (Pascoe & Smart Richman, 2009).

While material hardship and discrimination have been less studied in the perinatal period, both have been found to predict poorer health-related outcomes. Perceived

discrimination among mothers of color has been associated with significantly lower infant birth weight (Earnshaw et al., 2013). One study of pregnant and postpartum Black and Latinx women found that experiences of discrimination were affected by age and that there was a positive correlation between discrimination and symptoms of depression and anxiety (Rosenthal et al., 2015). It is unclear as to whether these findings extend to postpartum physical health and breastfeeding outcomes as well.

In a longitudinal study of postpartum women, those with high economic hardship reported significantly poorer mental and physical health; additionally; these women reported less stable health up to 12 months postpartum when compared to women with low economic hardship (Tucker et al., 2010). Examining social support, discrimination, and material hardship as moderators will help elucidate whether or not the presence or absence of these factors result in differing outcomes for mothers with ACEs. Given the information provided above, it is possible to consider that social support, and freedom from discrimination and material hardship may serve as buffers, reducing harmful effects of ACEs on postpartum health and breastfeeding.

The benefits of using life course theory are numerous and align well with social work philosophy, values, and ethics. Life course theory honors the impact of the social and historical environment on individual behavior, outcomes, and circumstances, and allows for the identification of areas of intervention to reduce risk factors and promote protective and resiliency factors (Hutchinson, 2011). In doing so, life course theory fits well with research that seeks to examine issues of oppression and domination to promote social change and equity.

Liberation Health Social Work

Belkin Martinez and Fleck-Henderson (2014) define the liberation health model as both a theory of human behavior and an approach to social work practice that underscores the influence of the sociopolitical environment in the lives and problems of persons in client status (e.g. individuals, families, groups, communities). Liberation health emerged from Freire's influence on education and Martín-Baró's later work focused in psychology (Kant, 2015). This model has been primarily described and applied in context of direct clinical social work practice. Using this holistic perspective, the client system—with the support of a therapeutic alliance—identifies and comprehends the personal, cultural, and institutional factors relevant to the problem they are experiencing. The ultimate goal, then, is to facilitate client self-empowerment and social action, to liberate themselves from oppression.

Liberation health theory was chosen as a structure for approaching this research study as existing research identifies numerous personal, cultural, and institutional factors influencing ACEs, and the development of PPD and PPA, postpartum physical health, and breastfeeding experiences. The liberation health social work model provides a holistic picture of multi-level, interrelated factors for understanding the origins specific to these postpartum outcomes, as well as areas to target for prevention and intervention. Additionally, within these factors, the study's moderating variables of interest—social support, experiences of discrimination, and material hardship—also emerged as notable influences on outcomes related to postpartum health and well-being.

Finally, I anticipated that some mothers' narratives would also highlight the role of ACEs and the three moderator variables in their lives, subsequent health experiences, and related outcomes. Furthermore, liberation health social work provided a multi-level structure (i.e. personal, cultural, and institutional) for analyzing contributors to postpartum outcomes in alignment with a social justice oriented approach to social work research. In harmony with the goal of this approach, study results can be used to further inform advocacy and activism related to prevention and intervention.

See Figure 1 for a diagram illustrating the relationships between life course theory, the liberation health social work model, and the constructs of interest in this study. The left side of the figure represents the life course, which may consist of potentially negative life experiences—ACEs, discrimination, material hardship, and limited or poor social support—and in combination with individuals' other life experiences may lead to PPD, PPA, poorer postpartum physical health, and breastfeeding challenges. Alternatively, these events may also be intervened upon and/or prevented in an effort to reduce the likelihood of poor postpartum outcomes.

The right-side of the figure (the triangle) was adapted from the original diagram purported by Belkin Martinez and Fleck-Henderson (2014) and personalized to the postpartum outcomes of interest in this study. The illustration uses the liberation health model to contextualize the problems—PPD, PPA, poor postpartum physical health, and breastfeeding challenges—within the larger US' sociopolitical environment; these outcomes of interest are centrally located within the triangle. Each point represents personal, cultural, and institutional factors contributing to the problematic outcomes.

Examples of some personal factors include a history of ACEs, a family history of mental health problems, and current symptoms of depression and anxiety. Cultural factors include classism, sexism, racism, and mental health stigma and institutional factors include a for-profit healthcare system, lack of federal paid parental leave, and an emphasis on individual pathology in health and mental health intervention. By utilizing life course theory and the liberation health social work model, social workers are in a better position to conduct research—rooted in social and economic justice—and advocate with women who are most affected by these negative postpartum outcomes for effective and culturally preferred prevention and intervention options.

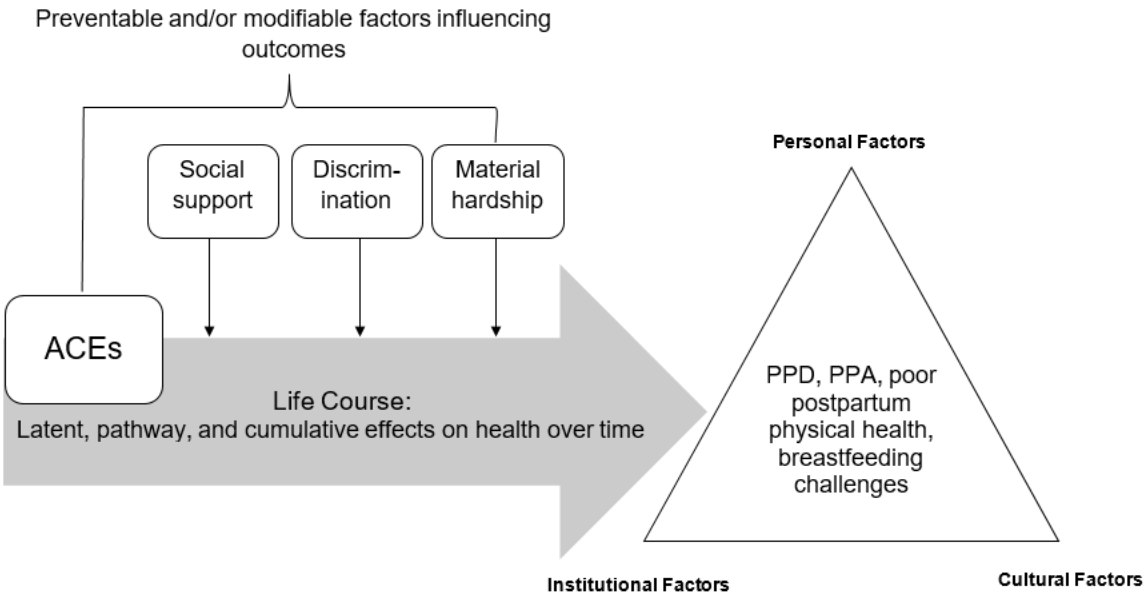

Figure 1. Theoretical framework of the study

Specific Aims and Research Questions

This study's aims, four research questions, hypotheses, and objectives are outlined below and can be found in Appendix A.

AIM 1 (*Quantitative*): To determine whether there is an association between adverse childhood experiences (ACEs) and (a) PPD, (b) PPA, (c) self-rated postpartum physical health, and (4) breastfeeding challenges, and whether or not material hardship, discrimination, and social support moderate the associations.

- *Objectives*: Conduct an online survey of a diverse cohort of postpartum women to retrospectively assess for experiences with ACEs and subsequent PPD, PPA, self-rated postpartum physical health, and breastfeeding challenges. The survey will also assess for material hardship, experiences of discrimination, and social support.
- **Research Question #1:** Are mothers' ACEs associated with PPD, PPA, self-rated postpartum physical health, and breastfeeding challenges?
    - *Hypothesis*: Higher ACEs scores will be associated with higher PPD and PPA scores, poorer self-rated postpartum physical health, and increased likelihood of breastfeeding challenges.
- **Research Question #2:** Do material hardship, experiences of discrimination, or social support moderate the association between ACEs and PPD, PPA, self-rated postpartum physical health, and breastfeeding challenges?
    - *Hypothesis*: The association between mothers' ACEs and PPD, PPA, poorer self-rated postpartum physical health, and increased likelihood of breastfeeding challenges will be stronger for those who report material hardship, experiences of discrimination, and lower social support.

AIM 2 (*Qualitative*): Explore experiences of PPD, PPA, postpartum physical health, and breastfeeding for women with high ACEs scores, including potential risk and protective factors influencing outcomes.

- *Objective*: Using a narrative approach to one-on-one interviews with postpartum women who reported high ACEs, investigate and describe the differences in lived experiences and perceptions about factors affecting outcomes between those who experienced PPD, PPA, poor self-rated postpartum physical health, and breastfeeding challenges and those who did not.
- **Research Question #3:** Among women who reported high ACEs, how do lived experiences and insights about factors that may have influenced outcomes differ between those who did not experience negative outcomes (PPD, PPA, poor self-rated postpartum physical health, and breastfeeding outcomes) and those who did?

AIM 3 (*Integrated*): Integrate quantitative and qualitative findings to provide a more comprehensive understanding of the associations between ACEs, PPD, PPA, self-rated postpartum physical health, and breastfeeding challenges.

- *Objectives*: After analyzing qualitative and quantitative data separately and summarizing these results, data will be combined, consolidated, and triangulated to better understand the associations between ACEs, PPD, PPA, self-rated postpartum physical health, and breastfeeding challenges. The integrated data will be summarized and presented using a visual side-by-side comparison—a joint display—of the qualitative and quantitative results to examine commonalities and differences, and make conclusions about how the qualitative data explains and gives context to the quantitative findings.
- **Research Question #4:** How—and to what extent—do the quantitative and qualitative study findings converge and diverge when examining potential associations between ACEs, PPD, PPA, self-rated postpartum physical health, and breastfeeding challenges?

Methodology

This study employed a mixed methods explanatory sequential design—quantitative data was collected in Phase I, followed by qualitative data collection in Phase II. After receiving approval to conduct the study from The Ohio State University Behavioral and Social Sciences Institutional Review Board, a diverse sample of US women (age 18 and older) who delivered a live baby within the previous year were recruited via various online and offline channels. Electronic recruitment flyers were shared with various online Facebook pages and groups catering to mothers of young children, volunteer research study databases (e.g., ResearchMatch and StudySearch), and through professional contacts with organizations and health professionals serving postpartum women.

Additionally, three paid Facebook advertisements were used to target a diverse set of participants. The online and flyer advertisements provided a direct link to eligibility requirements, consent, and the electronic survey.

After completing the online consent process, eligible participants ($N = 306$) completed an online survey (Phase I) on (a) ACEs; (b) depression (Edinburgh Postnatal Depression Scale); (c) anxiety (Perinatal Anxiety Screening Scale); (d) experiences of discrimination (Everyday Discrimination Scale); (e) social support (Multidimensional Scale of Perceived Social Support); (f) material hardship; and (g) demographics, childbirth, breastfeeding, and postpartum physical health. See Appendix B for all survey measures used. After Phase I completion, a strategically selected and diverse (i.e., age, income, race, and ethnicity) subset of Phase I participants ($n = 22$) with ACEs scores of four or greater participated in individual semi-structured telephone interviews (Phase II) to elicit lived experiences and insights about risk and protective factors that may have influenced postpartum outcomes. Interview questions (see Appendix C for the semi-structured interview guide) were developed using a narrative approach and began by asking about participants' experiences of ACEs and gradually moved toward present day experiences of pregnancy and postpartum health and mental health. Questions were broad and open-ended to gage participants' perceptions about their experiences and possible reasons for outcomes, whether negative or positive. Interviews lasted an average of 50 minutes. Phase I participants received a $10 electronic Amazon gift card incentive. Phase II participants received a $30 electronic Amazon gift card.

Multiple linear regression was performed to examine the association between ACEs and PPD and PPA. Logistic regression tested the association between ACEs and postpartum physical health and breastfeeding challenges. Binomial regression was also used to asses for associations between ACEs and the total number of breastfeeding challenges reported. Further, interaction terms were created using ACEs and each potential moderator variable (i.e., social support, material hardship, and experiences of discrimination) and entered into the regression models to assess for interaction effects. Using principles of grounded theory, initial, axial, and theoretical coding were employed to analyze the qualitative data (Saldaña, 2015; Strauss & Corbin, 1990). The author developed a codebook and independently coded the qualitative data. Then, a second coder also independently coded all 22 transcriptions to increase rigor of the study. The few discrepancies that existed in coding were resolved through discussion and the identification of final themes were made in consultation with the second coder. Lastly, Phase I and II data were integrated, summarized, and presented using a visual side-by-side comparison of the results to examine commonalities and differences, and make conclusions about how the qualitative data explained and gave context to the quantitative findings.

Description of Remaining Dissertation Chapters

For the purpose of this dissertation, the remaining chapters are organized as follows and references are arranged by each chapter.

Chapter 2. Postpartum Physical Health: The Role of Mothers' Adverse Childhood Experiences and Material Hardship

The first manuscript focuses on the outcome of mothers' self-rated postpartum physical health using Phase I quantitative data and answers the research questions:

1. How do recently postpartum women in the US rate their physical health?
2. Are mothers' ACEs associated with their self-rated postpartum physical health?
3. Do material hardship, experiences of discrimination, and/or social support moderate the association between ACEs and self-rated postpartum physical health?

Chapter 3. Breastfeeding Challenges: The Role of Mothers' Adverse Childhood Experiences and Material Hardship

The second manuscript uses Phase I quantitative data to investigate potential associations between ACEs, social support, material hardship, and discrimination on the outcome of breastfeeding challenges. Research questions include:

1. Are mothers' ACEs associated with breastfeeding challenges?
2. Are mothers' ACEs associated with the number of breastfeeding challenges experienced?
3. Do material hardship, experiences of discrimination, and/or social support moderate the associations between ACEs and breastfeeding challenges?

Chapter 4. Postpartum Depression and Anxiety: An Examination of Adverse Childhood Experiences, Discrimination, Material Hardship, and Social Support

The third manuscript uses a mixed methods approach to examine the effect of ACEs, social support, material hardship, and discrimination on maternal mental health outcomes, specifically PPD and PPA. Research questions that guided this study were:

1. Are ACEs associated with PPD and PPA?
2. Do material hardship, experiences of discrimination, or social support moderate the association between ACEs and PPD and PPA?
3. Among women who reported high ACEs, how do lived experiences and insights about factors that may have influenced outcomes differ between those who did not experience PPD and PPA and those who did?
4. How—and to what extent—do the quantitative and qualitative study findings converge and diverge when examining potential associations between ACEs and PPD and PPA?

Chapter 5. Conclusion

The final dissertation chapter provides an overview of implications of the findings in context of all three studies conducted. This includes an analysis of major findings, consideration of similarities and differences in results across manuscripts, key strengths and limitations of the dissertation, and implications and recommendations for future social work research, policy, and practice. Remaining data that are not discussed in this dissertation (due to space and time constraints), including qualitative findings specific to breastfeeding and mothers' physical health, will be analyzed at a future date.

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Chapter 2. Postpartum Physical Health: The Role of Mothers' Adverse Childhood Experiences and Material Hardship

Abstract

Postpartum physical health is a neglected field of research, yet postpartum physical health problems can significantly interfere with mothers' abilities to meet personal, familial, and work-related responsibilities. This study sought to provide increased understanding of the role that social determinants of health—adverse childhood experiences (ACEs), material hardship, and social support, and discrimination—play in mothers' postpartum physical health. An online survey was completed by a diverse sample of 306 postpartum women across the United States. Logistic regression results demonstrated that mothers' ACEs and material hardship were associated poorer self-rated postpartum physical health. Furthermore, an interaction between ACEs and material hardship was found suggesting that ACEs did not impact physical health as strongly for mothers who reported material hardship when compared to mothers who did not. No associations were found for social support or experiences of discrimination. Study results provide further support for macro-level interventions to prevent ACEs and material hardship and to intercede in existing cases to reduce negative effects on postpartum physical health.

Literature Review

Postpartum Physical Health

Postpartum physical health is under-researched and studies that do exist most often focus on complications related to labor and delivery, including associated maternal morbidity and mortality. Postpartum physical health problems are quite common with over 90% of mothers reporting at least one symptom one-week postpartum and 75% still reporting at least one symptom eight-weeks postpartum (Cooklin, Amir, Jarman, Cullinane, & Donath, 2015). A study of over 1,300 Australian women found health problems being reported at 6 and 7 months postpartum, such as exhaustion, back pain, sexual problems, urinary incontinence and perineal pain reinforcing the commonality of persistent physical symptoms (Brown & Lumley, 2000). Similarly, a longitudinal study of over 400 women in the United States (US) found that many women were still experiencing physical symptoms (e.g., breast and bowel problems, hemorrhoids, hot flashes, sexual problems, dizziness, respiratory problems, and fatigue) at 3, 6, and 9 months postpartum, highlighting the need for an extension of the customary 6-week period allotted to recover from childbirth (Gjerdingen, Froberg, Chaloner, & McGovern, 1993). Furthermore, research shows that poor postpartum physical health can prevent mothers from positively adjusting to motherhood and participating in daily tasks in terms of attending to personal needs, childcare, and work commitments (Ansara, Cohen, Gallop, Kung, & Schei, 2005).

Since some postpartum physical health symptoms are an expected side effect of childbirth, it is likely that they are also underreported, inadequately studied, and not well-

addressed (Cooklin et al., 2018). As a result, there is limited understanding about potential associations between postpartum physical health symptoms and later health outcomes. While reports of childbirth-related pain as well as severity of pain at 4-6 weeks postpartum has been associated with maternal depressive symptoms at 6 weeks and at 6 months postpartum (Chang et al., 2016), very little is understood related to mothers' overall physical health, experiences of chronic illness, and other non-labor and delivery specific physical health symptoms and challenges in the postpartum period.

Improved understanding of the complexity of physical health among women of childbearing age is required to improve postpartum health and well-being. This becomes increasingly important when considering health disparities. African American women and low-income women have higher rates of chronic illness (Misra, Grason, & Weisman, 2000) as well as increased risk of poor postpartum health and mental health, and other postpartum complications (Aziz et al., 2019; Dennis et al., 2012; Goyal, Gay, & Lee, 2010; Gyamfi-Bannerman et al., 2018). These outcomes have been attributed to institutionalized racism that results in differential healthcare as well as chronic and repeated stress exposure throughout the life course (Lu et al., 2010).

Adverse Childhood Experiences and Postpartum Physical Health

There are well-established connections between adverse childhood experiences (ACEs) and poor health outcomes broadly. A graded relationship has been found whereby a greater number of ACEs correlates with increased likelihood of multiple risk factors and health conditions (e.g. smoking, obesity, physical inactivity, depression, suicidality, heart disease, cancer, lung disease, liver disease, and poor self-rated health) in

adulthood (Felitti et al., 1998). ACEs are thought to simultaneously affect multiple body systems—nervous, immune, and endocrine—potentially triggering long-lasting, harmful inflammatory effects that put individuals at increased risk for chronic and serious health conditions and even premature death (Danese & McEwen, 2012). While recent studies have found that ACEs predict postpartum mental health symptoms (see Choi & Sikkema, 2016; Choi et al., 2018; Mersky & Janczewski, 2018; Seng et al., 2013), there is an absence of research examining the effect of ACEs on postpartum physical health symptoms and conditions. Given the robust link between ACEs and adult health, it is logical to hypothesize that ACEs may also negatively affect postpartum health.

Social Support, Material Hardship, Discrimination, and Postpartum Physical Health

The three variables of material hardship, social support, and discrimination are receiving increased attention in the literature because of their influence on physical health. Material hardship is frequently used to identify poverty, as a supplement to income measures (Beverly, 2001) and refers to the ability to meet one's basic needs (e.g., afford shelter, food, utility costs, and medical care) (Neckerman, Garfinkel, Teitler, Waldfogel, & Wimer, 2016). Experiences of financial or material hardship has been shown to predict death in adulthood (Tucker-Seeley, Li, Subramanian, & Sorensen, 2009) and self-rated physical health (Tucker-Seeley, Harley, Stoddard, & Sorensen, 2013).

There is also insurmountable evidence showing that social support—the level of actual or perceived material and emotional aid and companionship available through one's social network—can protect individuals from morbidity and mortality from a

myriad of illnesses and disease processes (Holt-Lunstad, & Uchino, 2015; Zimet, Dahlem, Zimet, & Farley, 1988). In a study of 296 recently postpartum Iranian mothers, Bahadoran and colleagues (2009) found a statistically significant correlation between the social support mothers received and their self-rated physical health scores. The more social support mothers received, the better their reported physical health. Additionally, experiences of discrimination, defined as perceived maltreatment based on one or more aspects of an individual's identity (e.g., race, ethnicity, gender, sexual orientation, religion, etc.), have been associated with health inequities and poor physical health (Krieger, 2014; Paradies et al., 2015; Williams & Mohammed, 2009), and women who experience discrimination are at increased risk for physical health problems (Black, Johnson, & VanHoose, 2015; Pavalko, Mossakowski, & Hamilton, 2003). Despite this information, there remains a paucity of studies examining the role of social support, material hardship, and discrimination specific to postpartum health.

Research Questions

Given the limited research specific to both postpartum physical health generally and potential associations between ACEs and later postpartum health, this study sought to provide increased understanding of the role that social determinants of health—namely ACEs, material hardship, social support, and discrimination—play in mothers' postpartum physical health. The three research questions guiding this study were:

1. How do recently postpartum women in the US rate their physical health?
2. Are mothers' ACEs associated with their self-rated postpartum physical health?

3. Do material hardship, experiences of discrimination, and/or social support moderate the association between ACEs and self-rated postpartum physical health?

Methods

This research was conducted as part of a multi-phase mixed methods study whereby both quantitative and qualitative data were collected to examine whether or not mothers' ACEs were associated with various postpartum outcomes. For the purposes of this study, phase one quantitative data relevant to postpartum physical health, ACEs, and potential moderating variables were of focus.

Data Collection and Sampling

This study was approved by the Behavioral and Social Sciences Institutional Review Board at The Ohio State University. The population of interest for this study was a racially, ethnically, and socioeconomically diverse sample of US women (age 18 and older) who delivered a live baby within the previous year. Participants were recruited using various approaches: ResearchMatch and StudySearch (online volunteer databases for research studies), paid, targeted Facebook advertisements, and sharing recruitment flyers with representatives and agencies serving postpartum women (e.g., Postpartum Support International) and various online Facebook groups aimed at supporting postpartum women from diverse backgrounds. Interested participants were directly linked to an online survey. Once consent was obtained, participants answered questions about their personal characteristics, physical and mental health, pregnancy, breastfeeding experiences, as well as measures assessing for a history of ACEs, and recent experiences

of social support, material hardship, and discrimination. Participants received a $10 electronic gift card for completing the online survey. The final sample size for this study was 306.

Measurement

Dependent variable. Self-rated physical health was measured using a single item: "In general, would you say your health is 'excellent, very good, good, fair,' or 'poor?'" This single-item measure was chosen because of its simplicity and demonstrated validity and reliability. It has been correlated with measures of health problems, health care utilization, and physician assessments of individuals' health (Bowling, 2005; Bombak, 2013). Self-reported physical health was then converted to a dichotomous variable (good, very good, and excellent health = 0; poor and fair health = 1).

Independent variable. ACEs were measured using a 16-question survey which included the original 10 core questions about physical, verbal, and sexual abuse, neglect, and household dysfunction experienced prior to 18 years of age as first introduced by the Centers for Disease Control and Prevention (CDC)-Kaiser Permanente ACE Study (Felitti et al., 1998). Six additional ACEs questions specific to experiences of discrimination, community violence, war, deportation, migration, and economic hardship developed by the National Survey of Children's Health and the World Health Organization were added (CAHMI, 2018; WHO, 2018) to include a more comprehensive measure of ACEs inclusive of other social determinants of health. The survey questions had dichotomous (yes/no) responses and a cumulative count served as the ACEs score.

Moderator variables. Three variables—material hardship, social support, and experiences of discrimination—were analyzed as potential moderator variables.

Material hardship. Material hardship—a family's ability to meet its basic needs in the previous 12 months—was measured using 10 questions informed by the work of Mayer and Jencks (1989) which was later validated for use in the Survey of Income and Program Participation and the Fragile Families and Child Wellbeing Study (Neckerman et al, 2016). Example questions included: "did you not pay the full amount of rent or mortgage payments," "did you borrow money from friends or family to help pay bills," "were you ever hungry, but didn't eat because you couldn't afford enough food?" Cronbach's alpha was .77. The material hardship score was dichotomized (0 = no report of material hardship; 1 = one or more "yes" responses to each example of material hardship).

Social support. Social support was measured using the 12-question Multidimensional Scale of Perceived Social Support (Zimet et al., 1988; [MSPSS]). Tallying the items and dividing by 12 provided a total score ($\alpha = .95$). Scores were then dichotomized (0 = a total score of 1 – 5.0, representing low social support; 1 = a total score of 5.1 – 7, representing high social support).

Experiences of discrimination. The Everyday Discrimination Scale (short version; EDS) provides a valid and reliable 5-item measure of the frequency of perceived daily discrimination based on ancestry or national origins, gender, race, religion, sexual orientation, or other reason (Sternthal, Slopen, & Williams, 2011). Examples of questions include, "in your day-to-day life how often have any of the following things happened to

you…you are treated with less courtesy or respect than other people," "people act as if they think you are not smart," "people act as if they are afraid of you," "you are threatened or harassed." Respondents could report experiencing discrimination "never," "less than once a year," "a few times a year," "a few times a month," or "almost every day." Cronbach's alpha was .82. EDS scores were dichotomized (never or less than 1x/year = 0; a few times a year to almost every day = 1)

Control Variables. Covariates included participant age, race, marital status, history of depression, anxiety, and chronic physical health problems, parity/number of births, age at first birth, infant feeding type (exclusive breastfeeding/breastmilk or not), and history of most recent child's admission to the neonatal intensive care unit.

Analysis

All data were analyzed using SPSS version 25 (IBM Corp., 2017). Descriptive statistics were calculated for all key variables. Data were assessed for linearity, multicollinearity, normality, and homoscedasticity to ensure they met assumptions required for logistic regression. A visualization of histograms of the continuous variables showed fairly normal distributions. The correlation coefficients of independent variables were all < .7 and the skewness and kurtosis of all variables were between ±2 and ±3, also indicating normality (West, Finch, & Curran, 1995). Variance Inflation Factor values were all below 4, suggesting an ignorable amount of multicollinearity among the variables (Hair, Anderson, Tatham, & Black, 1995). There was a random pattern in the scatterplot of standardized residuals against the standardized predicted values, suggesting that the data met the assumption of homoscedasticity and a scatterplot of the dependent

values against the standardized fitted values suggested the model satisfied the assumption of linearity. Listwise deletion was used to handle missing data because there were very few cases with missing data (n = 3), there remained sufficient power to run planned analyses, and the data appeared missing completely at random according to statistically non-significant results of a Little's Missing Completely at Random test. Continuous variables were mean centered and logistic regression using hierarchical entry was used to test whether or not ACEs were associated with participants' self-rated postpartum physical health. Interaction terms were created using ACEs and each dichotomized variable (material hardship, social support, and experiences of discrimination) to assess for moderation effects. Control variables were entered into the model first, followed by ACEs score, the three moderator variables, and the three interaction terms.

Results

See Table 2.1 for a summary of participant demographics. Participants' average age was 31.06 years (range 19 – 44). The large majority of participants were partnered or married (89.21%), college educated (72.87%), had an average of 1.81 children, and were diverse in terms of race and ethnicity. Approximately 70% of the sample were working part- or full-time outside the home.

Table 2.1. Sample Demographics (*N* = 306)

Notes: NA = Native American/American Indian; HS = high school diploma; GED = General Education Diploma

Characteristic	n (%)	Range	*M (SD)*
Mother's Age		19 – 44	31.06 (4.94)
Poverty Ratio		.02 – 2.31	.75 (.49)

Number of Children		1 – 6	1.81 (1.00)
Marital Status			
Single, Separated, Divorced	33 (10.78)		
Married	245 (80.06)		
Partnered	28 (9.15)		
Race and Ethnicity			
Black or African American	50 (16.34)		
Hispanic or Latina	34 (11.11)		
White or Caucasian	203 (66.34)		
Other (includes Asian & NA)	12 (3.92)		
Biracial	15 (4.90)		
Education			
Less than HS – HS diploma/GED	24 (7.84)		
Some College or Tech School	59 (19.28)		
College Graduate or More	223 (72.87)		
Employment Status			
Full-time	150 (49.02)		
Part-time	64 (20.91)		
Not Working Outside the Home	92 (33.07)		

Continued

Table 2.1. Sample Demographics, continued table.

Table 2.2 provides summary information about participants' scores on measures of ACEs, material hardship, social support, experiences of discrimination, and self-rated physical health. Just over 80% of the sample reported one or more ACEs; 41.83% reported an ACEs score of 4 or higher. Nearly half of participants reported material hardship while 24.34% reported low social support, and 35.29% reported regular experiences of discrimination. Over 56% described their physical health as very good or excellent. Additionally, nearly one-third of the sample reported being diagnosed or treated for a chronic health condition such as asthma, arthritis, autoimmune disease, cancer, diabetes, heart disease, or hyper/hypothyroidism.

Table 2.2. Independent, Dependent, and Moderator Variable Scores ($N = 304$)[1]

Notes: ACEs = adverse childhood experiences; [1]$N = 304$ due to missing data

Scores	n (%)	Range	*M (SD)*
ACEs		0 – 14	3.26 (2.94)
Score = 0	61 (19.93)		
Score = 1 – 3	117 (38.23)		
Score ≥ 4	128 (41.83)		
Material Hardship		0 – .90	.13 (.19)
High	143 (46.73)		
Low	163 (53.27)		
Social Support		1 – 7	5.60 (1.22)
High	230 (75.58)		
Low	74 (24.34)		
Discrimination		0 – 5	.95 (.89)
High	108 (35.29)		
Low	198 (64.70)		
Self-rated Physical health			
Excellent	48 (15.69)		
Very Good	126 (41.18)		
Good	110 (35.95)		
Fair	21 (6.86)		
Poor	1 (.35)		
Chronic Health Condition			
Yes	92 (30.07)		
No	214 (69.93)		

Table 2.3 provides results of the logistic regression model. The final model was statistically significant ($\chi 2(19) = 39.82$, $p < .01$. No interactions were found between ACEs and discrimination or between ACEs and social support. However, results indicated a significant interaction between ACEs scores and material hardship, $\beta = -.51$, $SE = .22$, $p < .05$. The significant interaction suggests that the experience of poor health has a different relationship to ACEs depending on the level of material hardship

experienced. For all mothers, poorer physical health was associated with higher ACEs scores. But, for mothers reporting material hardship, the effect of ACEs on poor health was not as strong as for mothers who did not report material hardship. Figure 2 illustrates the interaction between material hardship and ACEs. The only control variable that was a statistically significant predictor of poor health was mothers' history of a chronic health condition, which was associated with a 66% increase in the odds of reporting poor health.

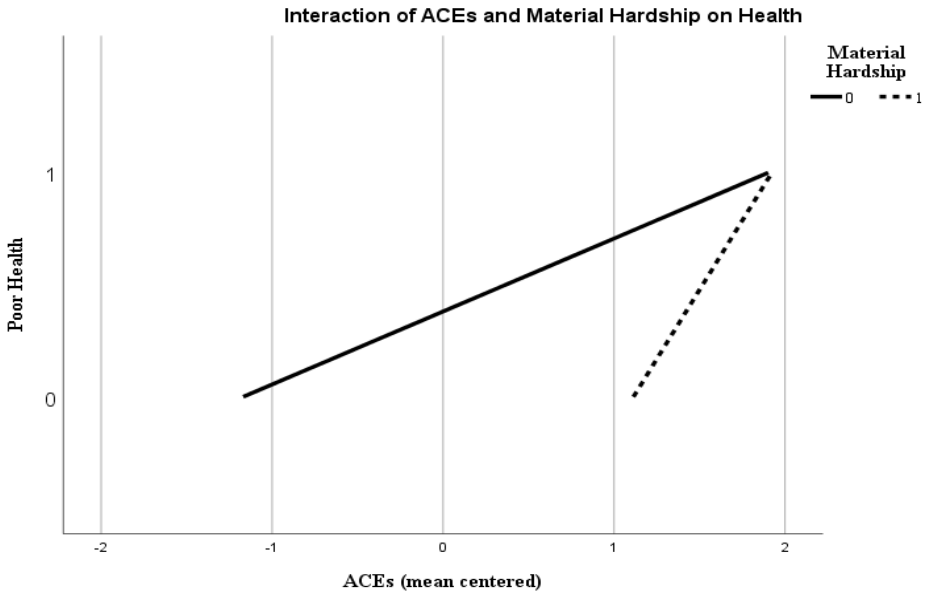

Figure 2. Interaction effects between ACEs and material hardship on health.

In terms of main effects, the odds of reporting poorer health were 1.54 times (95% CI [1.07, 2.22]) the odds of reporting good health among mothers' reporting higher

ACEs. Reports of discrimination and social support did not influence the odds of poor health. Mothers who had material hardship reported 11.00 times higher odds for (95% CI [1.09, 111.57]) poorer health.

Table 2.3. Logistic Regression Model of Mothers' Physical Health ($N = 304$)

Notes: NICU = neonatal intensive care unit; ACEs = adverse childhood experiences; *$p < .05$; $n = 304$ for this measure due to missing data

Characteristic	*B*	*SE (B)*	*Exp* (*B*)	95% CI	
Mother's Age	0.08	0.06	1.09	0.96	1.23
Black/African American	-0.47	0.72	0.62	0.15	2.54
Other Race (Asian or NA)	0.85	1.28	2.33	0.19	28.38
Biracial	0.07	0.92	1.07	0.18	6.54
Not Married	0.66	0.61	1.94	0.59	6.35
Age at First Birth	-0.11	0.06	0.90	0.79	1.02
Number of Births	-0.22	0.26	0.80	0.48	1.33
NICU Admission	-0.92	0.66	0.40	0.11	1.45
Infant Feeding Type	-0.26	0.56	0.78	0.26	2.32
History of Depression	0.80	0.67	2.23	0.60	8.31
History of Anxiety	0.42	0.71	1.52	0.38	6.05
History of Health Condition	1.30*	0.53	3.66*	1.29	10.40
ACEs Score	0.43*	0.19	1.54*	1.07	2.22
Discrimination	1.34	1.09	3.81	0.45	32.33
Material Hardship	2.40*	1.18	11.00*	1.09	111.57
Social Support	0.15	0.67	1.16	0.31	4.29
ACEs * Discrimination	-0.15	0.19	0.86	0.59	1.25
ACEs * Material Hardship	-0.50*	0.22	0.61*	0.40	0.94
ACEs * Social Support	0.26	0.21	1.30	0.86	1.96

Discussion

In terms of the first research question, results indicate that postpartum women in the sample rated their postpartum physical health positively. Just over half said their physical

health was very good or excellent and another third said their health was good. Despite positive self-reported physical health, nearly a third of mothers reported having been diagnosed with a chronic health condition. Similarly, Cheng and Li (2008), in a review of 22 peer-reviewed articles, found that most women rated their postpartum physical health as good, while simultaneously reporting health symptoms such as fatigue, sleep problems, breast and bowel problems, and pain. Cooklin and colleagues (2015) also found that women tend rate their physical health as good, very good, or excellent, even in the midst of having physical health symptoms. These findings suggest that a single measure of physical health may be insufficient to assess the complexity of mothers' overall physical health in the postpartum period. Additional information is needed specific to how physical health symptoms, including those related to chronic health conditions, affect mothers' overall quality of life and activities of daily living. Furthermore, the negative effects of ACEs may accumulate alongside other stressors along the life course. Thus, assessing ACEs influence on mothers' health over time, compared to mothers who did not have ACEs, would make a valuable addition to the literature. Despite these reservations, it is important to note that this study may be the first to demonstrate an association between mothers' ACEs and their self-rated postpartum physical health. Future research can build upon this work by examining the types of ACEs most predictive of postpartum physical health.

In the US, the rate of chronic diseases is on the rise; approximately 45% of Americans have at least one chronic physical health condition (Raghupathi & Raghupathi, 2018) and women are more likely to have multiple chronic conditions than

men. Using Medical Expenditure Panel Survey data from the Agency for Healthcare Research and Quality, researchers estimated that 22% of women of reproductive age (18 – 44 years) have multiple chronic conditions, compared to 14% of men (Buttorff, Ruder, & Bauman, 2017). Given the high rate of chronic illness reported in the current study, future research should investigate the prevalence and impact of chronic health conditions on postpartum physical health and recovery from childbirth. This is also important because poorer maternal health may be a risk factor for material hardship (Heflin & Butler, 2013).

For the second research question, it was observed that the majority of participants experienced ACEs and ACEs were associated with self-rated postpartum physical health. These findings are in line with previous research showing that women experience ACEs at higher rates than men (Alcalá, Tomiyama, & von Ehrenstein, 2017) and that ACEs predict increased odds of poorer self-rated physical health in adults (Monnat & Chandler, 2015). However, the present study may be the first to establish a connection between ACEs scores and mothers' self-rated postpartum physical health, specifically. These findings further support the rich body of literature demonstrating that potentially traumatic happenings in childhood can negatively affect adult health outcomes and self-rated physical health (CDC & Kaiser Permanente, 2016; Hughes et al., 2017; Merrick, Ford, Ports, & Guinn, 2018). As a result, increased efforts toward preventing ACEs, as well as research regarding the best interventions to reduce the negative impacts of ACEs on postpartum outcomes are needed.

Results pertaining to the third research question—whether or not material hardship, experiences of discrimination, and social support moderated the association between ACEs and self-rated postpartum physical health—showed that experiences of discrimination and social support did not emerge as moderators between ACEs and postpartum physical health. These unanticipated findings are not easily explained; however, as all potential moderating variables were entered into the model at once, it is possible that the experience of material hardship (which was also much more commonly experienced by participants than low social support or discrimination) overpowered the influence of social support and discrimination on physical health. Future studies should also examine the role of each of these variables separately as some literature has demonstrated that social support moderated the effect of ACEs on adults' physical health (Logan-Greene, Green, Nurius, & Longhi, 2014). A study of pregnant Canadian women found that social support had a buffering effect of ACEs on mother's postpartum health risk score, a measure of medical risk of women giving birth (Racine et al. 2018).

Moreover, existing research shows an association between perceived discrimination and self-rated physical health, although the relationship is more robust for mental health (Williams & Mohammed, 2009). Additionally, a longitudinal study of 343 African American women from Detroit, using the same 5-item measure of everyday experiences of discrimination as used in the current study, revealed that discrimination was predictive of self-rated physical health over time (Schulz et al., 2006). Lewis and colleagues' (2015) critique of the literature suggests that existing approaches to measuring discrimination may be inadequate and that experiences of discrimination may

be different from experiences of maltreatment as a result of discrimination. The researchers suggest that a more comprehensive assessment of discrimination should simultaneously include (a) implicit and explicit measures, (b) acute, chronic and traumatic discrimination experiences, (c) micro- and macro-level measures, and (d) the influence of multiple and intersecting identities on experiences of discrimination. It is important to note that in this study, respondents were not required to report whether their experiences of discrimination were perceived to be based on race, gender, religion, or some other marginalized identity. Future studies might consider assessing the effect of each type of discrimination separately, as well as the intersectionality of multiple types of discrimination. Further, including measures of objective physical health outcomes alongside subjective measures of physical health may provide a more comprehensive appraisal of health, particularly as experiences of discrimination may be subject to perception and minimization bias (Lewis et al., 2015).

While there was no interaction effect of discrimination or social support, material hardship did moderate the association between ACEs and physical health. Recent experiences of economic instability was a statistically significant predictor of mothers' poor health, but the effect of ACEs on poor health was more severe for mothers who did not report material hardship than for mothers who did. This novel finding suggests that recent experiences of economic insecurity may be more influential on self-rated physical health than mothers' ACEs. In this way, material hardship may be viewed as a more acute and recent adverse experience influencing health.

This finding has implications for economic programs and policies serving pregnant and postpartum women. As mothers who were able to take a longer leave via the US Family Medical Leave Act (FMLA) reported better physical health (Dagher, McGovern, & Dowd, 2014), it makes sense to suggest that women need at least that long to recover from the physical effects of childbirth. However, mothers eligible for FMLA may be more likely to already have more stable economic circumstances and live in dual earner households. Many mothers, particularly those who are lower income, may not be eligible for FMLA, and less likely to have job protection in the case of childbirth. Further, FMLA is unpaid and may cause a hardship for families of all socioeconomic statuses. While the effect of universal paid leave (UPL) on maternal health has rarely been studied (and is not a policy in the US), there is some evidence that UPL is associated with reduced maternal depressive symptoms and better overall health (Chatterji & Markowitz, 2012). More research is needed to establish a relationship between UPL and postpartum health, but providing mothers with economic stability throughout pregnancy, childbirth, and postpartum recovery may be a principal tactic to reduce the likelihood of material hardship that can negatively affect mothers' physical health. Furthermore, research examining the effects of living wage ordinances and programs such as The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) on postpartum physical health is needed.

Limitations

The limitations of this study primarily relate to design and measurement. The data are cross-sectional so the study only provides information about mothers' physical health

at one time point and does not allow for understanding self-rated postpartum physical health over time. Furthermore, participants were anywhere from a few days to nearly 12 months postpartum. The amount of time since childbirth is likely another variable affecting physical health.

Self-rated physical health was assessed using a one-item measure only, which is subject to response and social desirability bias. Future studies should attempt to establish construct validity by looking for correlations between multiple measures of physical health among a postpartum population. Additionally, while the one-item self-report measure of physical health has been used frequently in the literature and is considered a reliable and valid measure, some concerns exist about its applicability across ethnic and racial groups and among different levels of formal education and SES. Researchers have found that self-rated physical health measures are less reliable for individuals with lower SES, less education, and non-white race/ethnicity. (Dowd & Todd, 2011; Dowd & Zajacova, 2007; Lee et al., 2007). This discovery can be particularly problematic when attempting to study health disparities.

Conclusion

Postpartum physical health remains understudied and not well understood. This study is among the first to demonstrate that mothers' ACEs were associated with self-rated poor postpartum physical health. Additionally, study results supported an association between material hardship and physical health and an interaction between ACEs and postpartum health, suggesting that ACEs are more influential on poor health for mothers not experiencing material hardship. Poor postpartum physical health

negatively impacts mothers' quality of life as well as their ability to participate in familial and work-related roles and duties. Policy and programmatic level efforts to prevent ACEs and protect mothers from material hardship may bolster postpartum physical health.

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Chapter 3. Breastfeeding Challenges: The Role of Mothers' Adverse Childhood Experiences and Material Hardship

Abstract

Breastfeeding is the biological norm and is associated with numerous superior health outcomes for children and mothers when compared using breast milk substitutes. Yet, breastfeeding difficulties and the inability to meet one's breastfeeding goals are common in the United States (US) and may be more common among mothers who have experienced trauma. Using an online survey sample of 306 women across the US, this study tested whether or not mothers' adverse childhood experiences (ACEs) were associated with reports of breastfeeding challenges and additionally examined whether or not experiences of discrimination, material hardship, and decreased social support moderated this relationship. Among mothers who reported breastfeeding challenges, logistic and negative binomial regression models determined that while ACEs were not associated with the likelihood of experiencing any breastfeeding challenges, ACEs and material hardship were associated with the number of breastfeeding challenges reported. Additionally, an interaction between ACEs and material hardship was discovered, indicated that ACEs were more impactful on the number of breastfeeding difficulties for mothers not meeting the criteria for material hardship. Discrimination and social support were not significant predictors in the model. Results illuminated the high frequency of

breastfeeding difficulties among US women generally. Further, findings suggest the need for increased attention to both ACEs and material hardship to prevent and intervene in cases of breastfeeding challenges to maximize infant, maternal, and public health.

Literature Review

Breastfeeding and Public Health

Breastfeeding is crucial for infant, maternal, and public health. There is a dose-dependent relationship between breastfeeding and health outcomes, in that exclusive breastfeeding and increased duration of breastfeeding is associated with reduced risk of various diseases and conditions for children including ear infections, asthma, pneumonia, type 1 diabetes, sudden infant death syndrome, acute lymphocytic leukemia. Additionally, breastfeeding reduces maternal risk of type 2 diabetes, breast and ovarian cancer, and postpartum depression (Chowdhury et al., 2015; Eidelman, 2012). To forecast the health and economic risks of not breastfeeding according to optimal standard recommendations (exclusive breastfeeding for the first 6 months of life and continued breastfeeding in conjunction with food for at least 1 year), Bartick and colleagues (2017) concluded—using conservative estimates—that over 3,350 maternal and infant deaths could be avoided annually. Additionally, over $18.2 billion dollars (2014 estimate) could be saved each year by optimal breastfeeding in terms of medical, non-medical, and premature death costs.

Despite this knowledge, optimal breastfeeding remains elusive for the majority of women in the US. Up to 90% of women may experience breastfeeding challenges (Wagner, Chantry, Dewey, & Nommsen-Rivers, 2013) and 60% do not breastfeed for as

long as they intend (Odom, Li, Scanlon, Perrine, & Grummer-Strawn, 2013). In a national study of children born between 2010 and 2013, breastfeeding was initiated among 79.2% of children, but exclusive breastfeeding rates dropped to 20.0% at 6 months, and just 27.8% of children were still partially breastfeeding at 12 months (Anstey, Chen, Elam-Evans, & Perrine, 2017). Breastfeeding challenges are frequently cited as a reason for ceasing to breastfeed sooner than planned or advised. Some common challenges associated with early cessation of breastfeeding include pain, cracked nipples, oversupply or undersupply, medications and medical conditions, as well as infant-related difficulties, such as difficulty sucking, spitting up and fussiness (Cooklin et al., 2018; Ertem, Votto, & Leventhal, 2001).

Adverse Childhood Experiences and Breastfeeding Challenges

Adverse childhood experiences (ACEs) refer to various experiences of acute and/or chronic stress experienced between the ages of 0 and 18 years of age that have been associated with numerous unhealthy behaviors and medical conditions in adulthood (Felitti, 2009; Hughes et al., 2017). Most frequently, ACEs assess for experiences of physical, emotional, and sexual abuse, neglect, and parental or caregiver mental health and substance abuse issues. Little research has examined the relationship between ACEs and subsequent postpartum and maternal health outcomes. However, some research has shown that ACEs predict poorer prenatal and postpartum mental health (Choi, & Sikkema, 2016; Wosu, Gelaye, & Williams, 2015), as well as increased risk of having a high-risk pregnancy (Yampolsky, Lev-Wiesel, & Ben-Zion, 2010) and pregnancy complications, such as cervical insufficiency, and preterm labor and birth (Leeners,

Stiller, Block, Görres, & Rath, 2010). These associations appear particularly strong for the experience of childhood sexual abuse.

Minimal literature has investigated the relationship between mothers' ACEs and later breastfeeding experiences. In terms of ACEs, most studies have exclusively examined the influence of physical, emotional, and/or sexual abuse on breastfeeding. Cohort studies of Canadian, Australian, and Norwegian women found that those with a history of ACEs had increased odds of early breastfeeding cessation and were less likely to breastfeed exclusively for the recommended 6 months than women without ACEs (Coles, Anderson, & Laxton, 2016; Sørbø, Lukasse, Brantsæter, & Grimstad, 2015; Ukah, Adu, De Silva, & von Dadelszen, 2016).

Additionally, there is evidence that women with a history of childhood sexual abuse are equally likely to initiate breastfeeding, but are more likely to report breastfeeding related complications (e.g., pain, mastitis) than women without such histories (Elfgen, Hagenbuch, Görres, Block, & Leeners, 2017). Lesser studied ACEs (e.g., discrimination, economic hardship, and forced migration or deportation) should also be considered as having a potential influence on postpartum health and may be more inclusive of relevant experiences across diverse individuals. Thus, the current study examines a wider range of ACEs when compared to most previous studies of ACEs and perinatal and breastfeeding outcomes.

Social Support, Material Hardship, Discrimination, and Breastfeeding

Variables such as social support, material hardship, and discrimination are increasingly understood to play a role in health outcomes. Social support is perhaps the

most well studied factor influencing postpartum health and has been consistently shown to provide protection against poorer maternal physical and mental health and mother-child outcomes, including relationship difficulties, abuse and neglect (Atzl, Grande, Davis, & Narayan, 2019). Multiple types of support—emotional, informational, and tangible (in the forms of providing a breast pump or hands-on assistance)—have been shown to increase breastfeeding initiation and duration (Barona-Vilar, Escribá-Agüir, & Ferrero-Gandía, 2009; Raj & Plichta, 1998). Additionally, social support from both professionals and non-professionals has been associated with increased breastfeeding duration and increased likelihood of exclusive breastfeeding at 5 months (Meedya, Fahy, & Kable, 2010).

The relationship between experiences of discrimination and material hardship and breastfeeding outcomes is understudied. However, it has been well-established that social determinants of health, such as racism, sexism, and classism negatively affect health and mental health broadly (Allen, Balfour, Bell, & Marmot, 2014; Braveman, Egerter, & Williams, 2011). Disparities also exist specific to breastfeeding, as lower rates of breastfeeding initiation, exclusivity, and duration have been documented among low-income women and women of color (Anstey et al., 2017; Eidelman, 2012). In a secondary analysis of data from over 2,000 first-time mothers who participated in the Black Women's Health Study, the experience of structural racism in the workplace was associated with lower odds of breastfeeding at 3 – 5 months postpartum (Griswold et al., 2018). Robinson and colleagues (2019) recently conducted a scoping review of five quantitative and qualitative research articles focused on the role of bias on breastfeeding

barriers for African American mothers and concluded that experiences of racism negatively impacted both initiation and duration of breastfeeding. Additionally, findings showed that healthcare providers assumed that African American mothers would not breastfeed, and as a result, were less likely to provide mothers with lactation supports.

Material hardship has been associated with a variety of health outcomes and is increasingly used as a more comprehensive measure of poverty, assessing one's ability to meet basic needs, such as health care, housing, food, and other bills (Neckerman, Garfinkel, Teitler, Waldfogel, & Wimer, 2016). Material hardship has not yet been studied in relationship to breastfeeding, however, other measures of socioeconomic status, such as household income and education, have been shown to predict breastfeeding experiences. For example, mothers of lower socioeconomic status stop breastfeeding sooner than mothers of higher socioeconomic status (Heck, Braveman, Cubbin, Chavez, & Kiely, 2006; Temple Newhook et al., 2017). Based on this research, it is reasonable to expect that experiences of material hardship may also negatively affect breastfeeding.

Research Questions

The current study sought to better understand the potential associations between mothers' ACEs (using a more comprehensive measure than has been used in previous research, inclusive of familial abuse, neglect, and household dysfunction, in addition to newer questions regarding community, social and environmental experiences) and later breastfeeding challenges. This relationship was examined in and of itself, but also in the context of social support, discrimination, and material hardship, which has not been

previously studied. To that end, the study aimed to answer the following three research questions:

1. Are mothers' ACEs associated with whether or not they experienced breastfeeding challenges?
2. Are mothers' ACEs associated with the number of breastfeeding challenges experienced?
3. Do material hardship, experiences of discrimination, and/or social support moderate the association between ACEs and breastfeeding challenges?

Methods

This quantitative research resulted from a two-phase, modified mixed methods study examining the associations between mothers' ACEs and several postpartum outcomes.

Data Collection and Sampling

The current study received approval through The Ohio State University's Behavioral and Social Sciences Institutional Review Board. Study participants were recruited through various means in order to obtain a diverse sample in terms of race, ethnicity, and household income. Inclusion criteria were women, age 18 or older, who gave birth to a live baby in the previous 12 months, who were not currently pregnant, and who could complete the survey in English. Recruitment flyers were shared with professional contacts providing support services to perinatal women (e.g., Postpartum Support International, healthcare and mental health providers). Additionally, flyers were shared in various parenting and motherhood groups on Facebook and paid, targeted

Facebook advertising was used to attract a diverse sample. Lastly, individuals were invited to participate through ResearchMatch and StudySearch, volunteer online research databases.

Study flyers linked participants directly to the online survey where they provided informed consent for participation, confirmed that they met inclusion criteria, and then completed a series of questions related to demographics, pregnancy, postpartum, and breastfeeding experiences, as well as experiences of ACEs, material hardship, discrimination, and symptoms of depression and anxiety. Recognizing the possibility that survey questions may cause distress, respondents were provided with the phone number and website of Postpartum Support International and the National Suicide Hotline mid-survey, if they screened positive for postpartum depression or anxiety, and all participants—regardless of responses—received the information at survey completion. All participants had the opportunity to enter their email address to receive a $10 electronic gift card at the end of the online survey. A total of 306 individuals participated in the study and all data were collected in June and July 2019. A final sample of 288 was used for regression analyses in this study as this is number of participants with complete data on variables of interest who said they attempted breastfeeding.

Measurement

Dependent variable. Breastfeeding challenges were measured using the question, "did you experience any breastfeeding challenges" ("yes" = 1; "no" = 0)? For those who answered affirmatively, the number of breastfeeding challenges were recorded by summing the number of confirmatory responses to a number of questions relevant to

common breastfeeding difficulties established in the literature (see Cooklin, 2018). Examples of possible breastfeeding challenges included: “I had nipple pain,” “I had mastitis,” “I was not producing enough milk for my baby (undersupply),” “I was producing too much milk for my baby (oversupply),” “My baby had trouble sucking or latching,” “I did not have the support I needed to breastfeed from family, friends, and/or medical professionals,” “I had breastfeeding challenges related to my employment,” and “me and/or my baby had medical conditions or were taking medications that did not allow for breastfeeding.” Additionally, respondents had the option to “write in” other breastfeeding challenges experienced, but that were not provided in the list.

Independent variable. ACEs represented an observed variable and was assessed using the 10 core questions from the original CDC-Kaiser Permanente ACE Study about physical, verbal, and sexual abuse, neglect, and household dysfunction experienced prior to 18 years of age (Felitti et al., 1998). Six additional ACEs questions specific to experiences of discrimination, community violence, war, deportation, migration, and economic hardship, developed by the National Survey of Children’s Health and the World Health Organization, were added to the survey (CAHMI, 2018; WHO, 2018) to include a more comprehensive measure of ACEs. The 16 survey questions had dichotomous (yes/no) responses and a cumulative count served as participants’ ACEs score.

Moderator variables. Material hardship, social support, and experiences of discrimination were examined individually as potential moderator variables to see if they affected the association between ACEs and breastfeeding challenges.

Material hardship. Material hardship was measured using a 10-question tool assessing the ability of a family to meet its' basic needs in the previous year, in terms of food, housing, payment of household bills, and receiving medical care. This measure has been used in other large national surveys such as the Survey of Income and Program Participation and the Fragile Families and Child Wellbeing Study (Neckerman et al, 2016). The original questions were developed by Mayer and Jencks (1989); a few questions were updated to reflect more modern language and experiences (e.g., referenced the Supplemental Nutrition Assistance Program (SNAP) and cell phone service costs). Some sample material hardship questions were: "did you receive food or meals through a food bank, soup kitchen, or SNAP/the food stamps program," "did you not pay the full amount of rent or mortgage payments," "was your gas, electric service, or cell phone ever turned off, or the heating oil company did not deliver oil, because there wasn't enough money to pay the bills," "did you move in with other people even for a little while because of financial problems," and " was there anyone in your household who needed to see a doctor, go to the hospital, or buy medication but couldn't because of the cost?" Material hardship was treated as a binary variable (1 = one or more "yes" responses to examples of material hardship; 0 = "no" to all examples of material hardship. The sample's Cronbach alpha reliability coefficient for the scale was .76.

Social support. The Multidimensional Scale of Perceived Social Support (MSPSS), a 12-item measure, was used to assess participants' perceived emotional and practical support from family members, friends, and a significant other (Zimet et al., 1988). Sample items included: "there is a special person with whom I can share my joys

and sorrows," I get the emotional help and support I need from my family," and "I can count on my friends when things go wrong." Each statement allowed for a 7-point response ranging from "very strongly disagree" (1) to "very strongly agree" (7). A mean score was calculated by adding the responses and dividing by 12. Then the variable was made binary whereby a score of 1 – 5.0 represented lower social support (= 0) and a score of 5.1 – 7 represented higher social support (= 1) (Zimet, 2016). Cronbach's alpha was .95.

Discrimination. Experiences of discrimination were assessed using the Everyday Discrimination Scale (short version; EDS), a 5-item tool with a 6-point scale demonstrating the frequency of bias experienced, ranging from "never" (0) to almost every day (5) (Sternthal, Slopen, & Williams, 2011). Perceived discrimination can be based upon any aspect of one's identity such as gender, sexual orientation, ancestry, race, religion, or another reason. Questions include: "in your day-to-day life how often have any of the following things happened to you…you are treated with less courtesy or respect than other people," "you receive poorer service than other people at restaurants or stores," and "people act as if they are afraid of you." Cronbach's alpha was .82 for the sample. EDS item values were summed and the final score was made into a binary variable whereby a lack of discrimination = 0 for those responding "never" or "less than 1x/year" and experiences of discrimination = 1 for those responding "a few times a year" to "almost every day."

Control Variables. The control variables used in the study included participants' age and age at first birth, which were treated as continuous variables. Marital status

(single/separated/divorced, married, partnered), race and ethnicity (White, Black/African American, Hispanic/Latina, Biracial, Other—included Asian and Native American), participants' history of depression, anxiety, and chronic physical health problem (0 = no; 1 = yes), exclusive breastfeeding (0 = no; 1 = yes), and history of admission to the neonatal intensive care unit (NICU) (0 = no; 1 = yes) were categorical variables. Number of births was a discrete variable.

Analysis

Data were transferred from Qualtrics survey software (2019) and analyzed in SPSS version 25 (IBM Corp., 2017). After data cleaning and determining that the data met the assumption for regression analyses in terms of linearity, multicollinearity, normality, and homoscedasticity, descriptive statistics were run, and listwise deletion was applied for the few cases of missing data (n = 3). Continuous variables (e.g., participants' age, age at first birth, and ACEs score) were mean centered. Interaction terms were created using ACEs scores and each of the three binary moderators (social support, material hardship, and discrimination). First, logistic regression was employed to determine whether or not ACEs were associated with mothers' reported breastfeeding challenges. Additionally, moderators and interactions between ACEs and the moderators were tested. Second, negative binomial regression tested whether or not ACEs were associated with the count of breastfeeding challenges experienced. In the same way, moderators and interaction terms were also assessed. For both regression models, a hierarchical approach was taken whereby control variables were entered first, then ACEs scores, then the moderator variables, and lastly the interaction terms.

Results

Participants' average age was 31.06 and the majority were married or partnered and college educated. On average, respondents had 1.81 children. While the majority identified as White (66.34%), 16.34% were Black or African American, 11.11% were Hispanic or Latina, and 4.90% identified as biracial. The majority of the sample reported at least one ACE; 41.83% reported 4 or more ACEs. Over 75% of participants said they had high social support, approximately 35% experienced discrimination, and nearly 47% met the criteria for material hardship. Participants' median household income was $54,000 US Dollars (Range: $6,000 - $126,000). See Table 3.1 for the demographic characteristics of the sample.

Table 3.1. Sample Demographics (N = 306)

Notes: NA = Native American/American Indian; HS = high school diploma; ACEs = adverse childhood experiences; *N = 304 for this measure due to missing data

Characteristic	n (%)	*M (SD)*	Range
Mother's Age		31.06 (4.94)	19 - 44
Poverty Ratio		.75 (.49)	.02 – 2.31
Number of Children		1.81 (1.00)	1 - 6
Marital Status			
Single, Separated, Divorced	33 (10.78)		
Married	245 (80.06)		
Partnered	28 (9.15)		
Race and Ethnicity			
Black or African American	50 (16.34)		
Hispanic or Latina	34 (11.11)		
White or Caucasian	203 (66.34)		
Biracial	15 (4.90)		
Other (includes Asian & NA)	12 (3.92)		

Education			
Less than HS – HS diploma/GED	24 (7.84)		
Some College or Tech School	59 (19.28)		
College Graduate or More	223 (72.87)		
Employment Status			
Full-time	150 (49.02)		
Part-time	64 (20.91)		
Homemaker	63 (23.59)		
Not Working	29 (9.48)		
ACEs		3.26 (2.94)	0 - 14
Score = 0	61 (19.93)		
Score = 1 – 3	117 (38.23)		
Score = ≥ 4	128 (41.83)		
Everyday Discrimination		.95 (.89)	0 - 5
High	108 (35.29)		
Low	198 (64.70)		
Material Hardship		.13 (.19)	0 - .90
High	143 (46.73)		
Low	163 (53.27)		
Social Support*		5.60 (1.22)	1 - 7
High	230 (75.58)		
Low	74 (24.34)		

Continued

Table 3.1. Sample Demographics, continued table

In terms of breastfeeding data, 94.77% (*n* = 290) of the study sample said they attempted breastfeeding. Of those, 72.22% (*n* = 220) reported experiencing breastfeeding challenges. Respondents reported an average of 2.42 breastfeeding challenges (range: 1 – 9). The most commonly experienced breastfeeding problems included nipple pain (47.93%), breastfeeding challenges related to employment (43.10%), troubling getting

the child to latch to the breast (42.76%), and an undersupply of milk (36.21%). In addition to the list of common breastfeeding difficulties provided, respondents wrote in "other" challenges, such as their child having a milk allergy, mothers' anxiety or overwhelm related to breastfeeding and/or pumping breastmilk, NICU complications, inverted nipples, torticollis, and primary lactation failure (i.e. mothers' milk supply did not come in). Table 3.2 provides summary information about participants' breastfeeding experiences.

Table 3.2. Breastfeeding Challenges ($N = 290$)

Notes: *Other reasons for breastfeeding challenges: Milk allergy, mothers' anxiety/overwhelm, NICU complications, inverted nipple, torticollis, mothers' milk did not come in

Characteristic	n (%)
Breastfeeding Challenges	
Yes	220 (72.22)
No	70 (27.78)
Number of Breastfeeding Challenges ($M = 2.42$, $SD = 1.96$)	
1	30 (10.34)
2	49 (16.90)
3	59 (20.34)
4	43 (14.83)
5	18 (6.21)
6	14 (14.83)
7	3 (1.03)
8	3 (1.03)
9	1 (0.34)
Breastfeeding Challenge Type	
Nipple Pain	139 (47.93)
Challenges re: Employment	128 (43.10)
Trouble Latching	124 (42.76)
Undersupply	105 (36.21)

Oversupply	40 (13.79)
Mastitis	34 (11.72)
Tongue Tie	34 (11.72)
Thrush	34 (11.72)
Lack of Support	34 (11.72)
Advised to Give Formula	33 (11.38)
Clogged Ducts	21 (7.24)
Medical Condition/Medications	10 (3.45)
Other*	34 (11.72)

Continued

Table 3.2. Breastfeeding Challenges, continued table

Table 3.3 shows results from the logistic regression model. The final model was statistically significant ($\chi 2(18) = 39.17$, $p < .01$. No interactions were found between ACEs and social support, discrimination, or material hardship and ACEs scores were not a significant predictor of breastfeeding challenges. However, three control variables were statistically significant ($p < .05$) predictors of whether or not mothers reported breastfeeding difficulties: Mothers' current age, mothers' age the first time they gave birth, and whether or not their youngest child was admitted to the NICU.

Mothers' who were older the first time they first gave birth had 1.16 times (95% CI [1.04, 1.29]) higher odds of experiencing breastfeeding challenges when compared to those who were younger. Mothers who were younger at the time of the survey had an 88% decrease in odds of experiencing breastfeeding challenges. When compared to mothers whose child had a NICU admission, mothers' who did not experience a NICU admission had a 17% decrease in odds of experiencing breastfeeding challenges.

Table 3.3. Logistic Regression Model of Mothers' Breastfeeding Challenges ($N = 288$)

Notes: NICU = neonatal intensive care unit; ACEs = adverse childhood experiences; *$p < .05$.

Characteristic	*B*	*SE (B)*	*Exp* (*B*)	95% CI	
Mother's Age	-0.13*	0.05	0.88	0.79	0.97
Black/African American	0.00	0.50	1.00	0.38	2.65
Other Race (Asian or NA)	-0.35	0.68	0.71	0.19	2.70
Biracial	-0.72	0.70	0.49	0.12	1.94
Not Married	0.36	0.50	1.43	0.54	3.80
Age at First Birth	0.15*	0.06	1.16	1.04	1.29
Number of Births	-0.12	0.19	0.88	0.61	1.28
NICU Admission	-1.76*	0.66	0.17	0.05	0.63
History of Depression	-0.57	0.40	0.57	0.26	1.24
History of Anxiety	0.77	0.40	2.17	0.99	4.78
History of Health Condition	-0.18	0.34	0.83	0.43	1.62
ACEs Score	0.16	0.09	1.18	0.98	1.41
Everyday Discrimination	0.27	0.55	1.32	0.45	3.84
Material Hardship	0.88	0.54	2.40	0.83	6.97
Social Support	-0.12	0.39	0.89	0.42	1.89
ACEs * Discrimination	-0.11	0.13	0.90	0.70	1.14
ACEs * Material Hardship	-0.12	0.13	0.89	0.69	1.14
ACEs * Social Support	-0.08	0.13	0.92	0.71	1.19

Table 3.4 provides results of the negative binomial regression model. A significant interaction occurred between ACEs scores and material hardship, $\beta = -.07$, $SE = .02$, $p < .001$, suggesting that the effect of ACEs on the number of breastfeeding challenges was stronger for mothers who did not meet the criteria for material hardship. Figure 3 provides a visualization of the interaction between ACEs and material hardship on the number of breastfeeding challenges.

Main effects demonstrated that the odds reporting more breastfeeding challenges were 1.09 times (95% CI [1.06, 1.12]) the odds of reporting fewer breastfeeding challenges for mothers with higher ACEs scores. Experiences of discrimination and

social support did not affect the number of breastfeeding challenges reported. However, mothers experiencing material hardship had 1.45 times increased odds (95% CI [1.23, 1.71]) of reporting more breastfeeding challenges than mothers not experiencing material hardship.

In terms of covariates, mothers who were older the first time they gave birth and mothers' history of a chronic health condition both had increased odds of reporting more breastfeeding challenges. Additionally, mothers who were younger at the time of the survey had 96% decreased odds of reporting more breastfeeding challenges than mothers who were older. Racial differences indicated that Black/African American mothers had a 69% decrease in odds of reporting more breastfeeding challenges and mothers' identifying as biracial had a 77% decrease in odds of reporting more breastfeeding challenges.

Table 3.4. Negative Binomial Regression Model of Amount of Breastfeeding Challenges ($N = 288$)

Notes: NICU = neonatal intensive care unit; ACEs = adverse childhood experiences; *$p <$ .05. **$p \leq .001$.

Characteristic	*B*	*SE (B)*	*Exp* (*B*)	95% CI	
Mother's age	-0.04**	0.01	0.96	0.94	0.98
Black or African American	-0.38**	0.09	0.69	0.57	0.82
Other race (Asian or NA)	-0.14	0.15	0.87	0.65	1.17
Biracial	-0.26*	0.13	0.77	0.60	0.99
Not married	-0.08	0.07	0.93	0.81	1.07
Age at first birth	0.04**	0.01	1.04	1.02	1.07
Number of births	-0.10	0.04	0.91	0.84	0.99
NICU admission	-0.05	0.08	0.96	0.82	1.11
History of Depression	0.09	0.06	1.10	0.97	1.24
History of Anxiety	0.05	0.06	1.06	0.94	1.19
History of Health Condition	0.16*	0.05	1.17	1.06	1.29

ACEs Score	0.08**	0.01	1.09	1.06	1.12
Everyday Discrimination	-0.03	0.09	0.97	0.82	1.16
Material Hardship	0.37**	0.08	1.45	1.23	1.71
Social Support	0.06	0.06	1.06	0.94	1.19
ACEs * Discrimination	-0.01	0.02	0.99	0.96	1.02
ACEs * Material Hardship	-0.07**	0.02	0.94	0.90	0.97
ACEs * Social Support	0.01	0.02	1.01	0.97	1.05

Continued

Table 3.4. Negative Binomial Regression Model of Amount of Breastfeeding Challenges, continued table

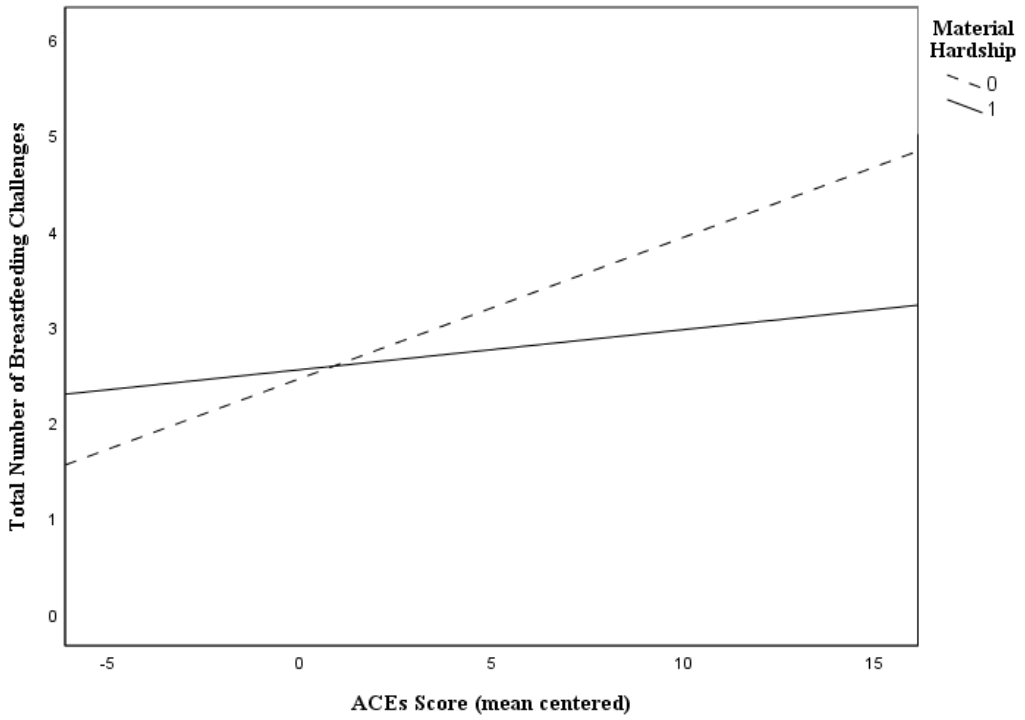

Figure 3. Interaction effects between ACEs and material hardship on number of breastfeeding challenges.

Discussion

ACEs were very common among postpartum women in this study with over 80% reporting at least one ACE. A systematic review reported prevalence rates of childhood maltreatment among perinatal women ranged between 16% and 66% across studies (M = 30%) (Choi & Sikkema, 2016). It is possible that the six additional ACEs questions in this study resulted in the higher rate of ACEs than recorded in earlier studies of perinatal women.

In line with previous research, this study demonstrated that breastfeeding challenges are common for US mothers (Odom et al., 2013), regardless of their history of ACEs. Breastfeeding challenges were more common among older mothers and mothers whose children were admitted to the NICU. These are not new findings, but highlight that additional lactation supports are needed and may increase breastfeeding rates among these groups (Kitano et al., 2016; Oza-Frank, Bhatia, & Smith, 2013).

The majority of breastfeeding challenges (e.g., nipple pain, troubling latching, having an undersupply of milk) reported were reflective of those most frequently reported in the literature (Cooklin et al., 2018). Of note, breastfeeding difficulties related to employment emerged as the second most frequently identified challenge. Common obstacles to maintaining successful breastfeeding while employed include a lack of flexibility in work hours and schedule, a lack of appropriate and private space for pumping breast milk, and lack of employer support for breastfeeding and milk expression (Office of the Surgeon General, 2011).

Earlier return to work after childbirth has been associated with reduced duration of breastfeeding (Chuang et al., 2010) and full-time work has shown to decrease breastfeeding rates when compared to mothers who work part-time or who are unemployed (Mandal, Roe, & Fein, 2010; Ogbuanu, Glover, Probst, Hussey, & Liu, 2011). Lack of paid parental leave is also associated with lower breastfeeding rates (Baker & Milligan, 2008; Burtle & Bezruchka, 2016) and salaried professionals are likely to have more breastfeeding success and employer-related support than hourly workers (Marinelli, Moren, & Taylor, and The Academy of Breastfeeding Medicine, 2013). Thus, there is a need for increased attention toward the specific kinds of employment-related breastfeeding challenges experienced in order to prevent and address them, and ongoing advocacy efforts focused on federal paid parental leave in the US.

With regards to the first research question,—contrary to the hypothesis, the analysis failed to establish an association between ACEs and whether or not mothers' experienced breastfeeding challenges. This may be because the large majority of the sample who attempted breastfeeding reported both ACEs and breastfeeding challenges. Future research should include larger sample sizes, inclusive of more women who did *not* experience breastfeeding challenges or ACEs.

Results supported the hypothesis for the second research question, making this study the first to establish an association between mothers' ACEs and the number of breastfeeding challenges experienced. As ACEs increased, so did the number of breastfeeding challenges reported. This discovery fits with previous ACEs research that has established a graded dose-response relationship between ACEs and many types of

health behaviors and mental health and physical health conditions in adulthood (Felitti, 2002). As the number of and combination of ACEs increases across categories their cumulative effects worsen the risk of multiple adverse outcomes.

Similar to the previous research question and in line with other scientific inquiries (see Columbo et al., 2018; Kitano et al., 2013), findings showed that as maternal age increased, so did the odds of experiencing more breastfeeding challenges. While the mechanism for this finding has not been established, earlier research purports that increased breastfeeding difficulties among older mothers should be expected as maternal age at first childbirth continues to increase in Global North countries (Colombo et al., 2018).

A surprising finding, inconsistent with prior literature, was that Black/African American and Biracial mothers had significantly lower odds of reporting more breastfeeding challenges than White women. A possible reason for this may be that racial minority women are less likely to receive lactation education and supports, and therefore, are less likely to identity breastfeeding challenges that may exist. A study of the 2011 Maternity Practices in Infant Nutrition and Care survey, linked to US Census data, found that zip codes with higher concentrations of Black residents had reduced access to maternity care facilities providing recommended lactation practices, such as early initiation of breastfeeding, limited use of breastfeeding supplements or pacifiers, rooming-in with baby, and lactation support after discharge (Lind, Perrine, Li, Scanlon, & Grummer-Strawn, 2014). Further, a systematic review of racial and ethnic disparities in breastfeeding literature reported that minority women experience additional, unique

breastfeeding challenges, including a lack of support for breastfeeding in their social network, a lack of cultural acceptance and barriers, and an absence of information that supports successful breastfeeding (Jones, Power, Queenan, & Schulkin, 2015).

In contrast to study hypotheses, discrimination and social support were not significant predictors of breastfeeding challenges, nor were they shown to moderate the association between ACEs and breastfeeding challenges. It is possible that there were not enough participants reporting low social support or high discrimination to detect a difference with treating variables dichotomously. Alternatively, it could be argued that high perceived social support could act to both increase and decrease breastfeeding challenges. Receiving positive social support could result in preventing breastfeeding challenges or in the instance of difficulty, could end up relieving those challenges. Conversely, someone reporting high social support may in fact be receiving information contrary to breastfeeding success and/or support toward breastfeeding cessation, which may result in heighted recognition of breastfeeding challenges.

In terms of discrimination, the study findings contradict previous research showing that discrimination plays a role in creating and maintaining health disparities (Krieger, 2014). As aforementioned, it may be that as a result of bias and maltreatment, mothers did not have the information or support required to recognize and identify breastfeeding challenges. As a result, as association between ACEs, discrimination and breastfeeding, including an interaction between ACEs and breastfeeding challenges would be less likely to be observed.

However, results also revealed that mothers reporting material hardship were at increased risk for more breastfeeding challenges than mothers who did not report material hardship. An interpretation of the interaction between ACEs and material hardship proposes that material hardship may function as a type of adverse experience, but one that is experienced in adulthood. From this perspective, experiences of material hardship emerge as a kind of current traumatic event that takes priority over ACEs from the past. Thus, it appears that a recent experience of material hardship in adulthood has a more negative influence on breastfeeding challenges than ACEs alone. Women who did not report material hardship, then, did not have the burden of that stressor, but may remain negatively affected by any ACEs.

Overall, this study adds to the literature by shedding light on the role of mothers' ACEs and material hardship in breastfeeding experiences. To most effectively support mothers' breastfeeding goals, a holistic assessment and approach to care is vital, which may demand inquiry into mothers' history of ACEs and recent experiences of material hardship. As care providers increasingly consider screening for ACEs or other trauma history in practice (Raja, Hasnain, Hoersch, Gove-Yin, & Rajagopalan, 2015), this information may be helpful in identifying women who may be at increased risk of breastfeeding difficulties. Through the receipt of physical health, mental health, and/or lactation information and services, it may be possible to help prevent or reduce the number of breastfeeding challenges experienced and/or intervene and help resolve them earlier.

Similarly, there needs to be more focus on the role of material hardship in breastfeeding experiences, as opposed to only considering income and/or poverty threshold information. Income focused and poverty measures do not necessarily account for debt, wealth, or access to credit and other resources, where material hardship may provide a more accurate and comprehensive measure of the stressful experience of trying to make ends meet (Gershoff, Aber, Raver, & Lennon, 2007) and better identify those most in need of supports to prevent breastfeeding barriers. It is possible that a family's income may be above the outdated poverty threshold, but that circumstances unaccounted for (i.e. rising cost of housing, a sudden loss of a job, illness, or another unexpected crisis) cause material hardship, negatively influencing health outcomes. While assessing for material hardship may well assist with early identification and intervention among individual women at risk for breastfeeding challenges, there is a need for more macro-level interventions to reduce material hardship as well.

The sheer numbers of mothers reporting ACEs and breastfeeding challenges warrants more consideration and provides an impetus for policies and programs to prevent and ameliorate these health-related outcomes. A policy brief from the Urban Institute about efforts to reduce material hardship among low-income families explained that enrollment in federal programs such as Temporary Assistance for Needy Families (TANF), SNAP, Medicaid, and the State Children's Health Insurance Program (SCHIP) reduced material hardship and the number of material hardships experienced by 48% (McKernan, Ratcliffe, & Iceland, 2018). Additionally, the brief's authors found that a $1.00 increase in the minimum wage (assuming work hours stayed the same) reduced

material hardship by 4% - 6% for low-income families with children. Their findings state that material hardship would be even more common without such federal policies, especially given the steady increase in wealth inequality. Some recommendations for reducing material hardship on a larger scale would be through widening the eligibility for publicly funded programs such as TANF, SNAP, and SCHIP, providing families with a child allowance (a cash payment provided via tax credit), introducing universal healthcare, federal paid family leave, and universal child care and pre-school programs (Rodems & Shaefer, 2019). Providing such support to families with young children may also aid in the prevention and reduction of future ACEs.

Limitations

This study contains limitations and related recommendations for future research. Methods relied on the use of a non-random, convenience sample which limits generalizability of the findings. It is likely that respondents fall into somewhat of a privileged group as they had the time required to complete the survey and they had internet access. Based on previous ACEs research, it is likely that less privileged participants would be more likely to have more ACEs, as well as more barriers to breastfeeding. Additionally, they may be more likely to experience more discrimination and have less social support.

All measurement tools relied on self-report and retrospective recall which are subject to social desirability and recall bias (Althubaiti, 2016). Future studies are needed to replicate findings and should be comprised of larger sample sizes inclusive of more women who did not experience ACEs or breastfeeding challenges to better test for

differences between outcomes groups. Subsequent research should more deeply investigate the role of discrimination and social support in breastfeeding initiation, duration, and challenges experienced. This may be done through larger survey studies as well as qualitative work that explicitly asks about mothers' experiences of discrimination and social support and how they may have affected breastfeeding experiences.

Results also accentuate the role of employment-related barriers in breastfeeding and the current study was limited by including this broadly as one type of breastfeeding challenge rather than identifying specific employment obstacles in detail. Additionally, while this study identified various breastfeeding challenges experienced, it did not follow mothers longitudinally to be able to connect the rates of breastfeeding duration to breastfeeding challenges among women with ACEs. Lastly, this study focused on cumulative ACE scores in affecting outcomes only. Forthcoming studies should investigate whether or not particular ACEs are stronger predictors of breastfeeding outcomes than others.

Conclusion

This study may be the first to establish a relationship between ACEs, material hardship, and breastfeeding challenges. ACEs, material hardship, and breastfeeding challenges may be more common among postpartum women than previously considered and must be attended to improve child, maternal, and public health. The odds of experiencing more breastfeeding challenges are may be higher among women reporting more ACEs, but no material hardship. While caregivers can collect this information during initial assessments to help prevent breastfeeding related complications postpartum,

policy efforts are required to help prevent and reduce ACEs and material hardship on a larger scale. Future studies should further explore the potential role of discrimination and social support in influencing breastfeeding challenges, the specific types of employment-related barriers to breastfeeding experienced, as well investigate the types of ACEs most associated with breastfeeding challenges.

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Chapter 4. Postpartum Depression and Anxiety: An Examination of Adverse Childhood Experiences, Discrimination, Material Hardship, and Social Support

Abstract

Together, postpartum depression and postpartum anxiety (PPD/A) represent a major public health problem affecting approximately 20% of women. Mothers' adverse childhood experiences (ACEs)—abuse, neglect, and household dysfunction—have been associated with poorer postpartum mental health. Informed by a life course perspective and a liberation health social work approach, this retrospective cohort study used a mixed methods explanatory sequential design to further examine the association using the core ACEs questionnaire, as well as newer ACEs items that focus on the social environment. Further, social support, material hardship, and discrimination were considered in potentially moderating the association between ACEs and PPD/A among a diverse sample of postpartum women across the United States. Multiple linear regression was employed in phase I ($N = 306$) to assess associations between variables and test for interactions. In phase II, individual interviews were conducted with a strategically selected subset of phase I participants ($n = 22$) with high ACEs scores (≥ 4) to gather insights into potential risk and protective factors that influenced their outcomes. Open, axial, and selective coding were used to analyze findings. Phase I and phase II results were integrated using a joint display. While moderation effects were not found, results suggest that current experiences of inadequate social support, material hardship, and

discrimination may have stronger associations with PPD/A than ACEs. This information can be used to inform micro- and macro-level prevention and intervention strategies to reduce mental health disparities.

Literature Review

Postpartum Depression and Anxiety

Postpartum depression (PPD) is a significant public health issue affecting 15-20% of women in the United States (US) (Gaynes et al., 2005; Sit & Wisner, 2009). Growing evidence suggests that postpartum anxiety (PPA) is even more common than PPD. Together, PPD and PPA (i.e., PPD/A) represent the most common side effect of pregnancy and childbirth (Gaynes et al., 2005; Paul, Downs, Schaefer, Beiler, & Weisman, 2013; Sit & Wisner, 2009). In addition to mothers' symptoms which may include melancholy, listlessness, panic, worry, rage, intrusive thoughts, sleep disturbance, irritability, and severe lethargy (Beck, 1992; Misri, Abizadeh, Sanders, & Swift, 2015), those with untreated PPD/A are more likely to have poor breastfeeding outcomes (Dennis & McQueen, 2009; Ystrom, 2012), worse postpartum physical health (Brown, & Lumley, 2000; Mezzacappa, 2004), and children with developmental challenges (Beck, 1998; Gress-Smith, Luecken, Lemery-Chalfant, & Howe, 2012; Stewart, 2007). Of growing concerning is the fact that self-harm ideation during pregnancy occurs 9 – 19% of the time (Wisner et. al., 2013; Howard, Flach, Mehay, Sharp, & Tylee, 2011) and that suicide is one of the leading causes of maternal death (Lindahl et al., 2005; Oates, 2003). Finally, PPD/A has been associated with lower incomes, lower rates of employment, and increased applications for disability and public assistance (Sontag-Padilla, Schultz, Reynolds, Lovejoy, & Firth, 2013). Consequently, PPD/A is a significant public health issue that warrants attention.

The cause of PPD/A remains unclear. However, a combination of biological, psychological, familial, genetic, social, cultural, economic, and environmental factors have been implicated (Bina, 2008; Dennis & Hodnett, 2007; Ellsworth-Bowers & Corwin, 2012). While most maternal mental health studies have been limited by their focus on White, middle-class women (Abrams & Curran, 2007), some key PPD/A risk factors identified include low perceived social support (Leahy-Warren, McCarthy, & Corcoran, 2011; Norhayati, Nik, Asrenee, Wan, 2015), low socioeconomic status (Dolbier et al., 2013; Rich-Edwards et al., 2006), and racial minority status (Gress-Smith et al., 2012; Mukherjee, Trepka, Pierre-Victor, Bahelah, & Avent, 2016). Additionally, the unique stressors encountered by women immigrating to the US may put them at increased risk for PPD/A, although the experiences of these groups are understudied (O'Mahony, Donnelly, Bouchal, & Este, 2013). Notably, evidence suggests that low-income women and women of color are less likely than White women to receive treatment for postpartum mental health challenges (Abrams & Curran, 2009; Mukherjee et al, 2016).

Adverse Childhood Experiences and Postpartum Mental Health

Felitti and colleagues (1998) started the exploration of adverse childhood experiences (ACEs) in the late 1990s to understand the relationship between negative childhood experiences and later health problems and behaviors in adulthood. This work was undertaken via a partnership between The United States (US) Centers for Disease Control and Prevention (CDC) and Kaiser Permanente. Researchers collected health outcomes data and retrospectively surveyed over 17,600 adults regarding how many ACEs they had across seven categories—psychological abuse; physical abuse; sexual

abuse; violence against mother or step-mother; and living with someone who: had a mental illness or attempted suicide; had a substance abuse problem; or was imprisoned. Results demonstrated nearly 67% of the sample reported at least one ACE, and more than 20% reported three or more ACEs (CDC, 2016). Subsequent studies using Behavioral Risk Factor Surveillance System (BRFSS) data found that those with higher numbers of ACEs were more likely to be female, of racial minority status, unemployed or underemployed, have lower household income, less than high school education, and no health insurance (Merrick, Ford, Ports, & Guinn, 2018; Nurius, Green, Logan-Greene, Longhi, & Song, 2016).

Findings from the landmark CDC-Kaiser Permanente study and numerous subsequent studies since have established a clear and increasingly robust association between ACEs and various chronic and life-threatening diseases and conditions of adulthood, including depression and anxiety (Kalmakis & Chandler, 2015; Van Niel, Pachter, Wade Jr, Felitti, & Stein, 2014). Moreover, a graded relationship has been found whereby a greater number of ACEs correlates with increased likelihood of multiple risk factors and health conditions (e.g. smoking, obesity, physical inactivity, depression, suicidality, heart disease, cancer, lung disease, liver disease, and poor self-rated health) (Felitti et al., 1998). ACEs are thought to simultaneously affect multiple body systems—nervous, immune, and endocrine—potentially triggering long-lasting, harmful inflammatory effects that put individuals at increased risk for health and mental health conditions and even premature death (Danese & McEwen, 2012).

Since the original study, ACEs research has proliferated. Additionally, there have been numerous adaptations and expansions made to the original core ACEs survey to

assess for other potentially stressful or traumatic childhood experiences such as economic hardship, parental death, time spent in foster care, bullying, medical trauma, deportation, migration, and discrimination (The Child and Adolescent Health Measurement Initiative [CAHMI], 2018.; World Health Organization [WHO], 2018), although these are only beginning to be studied in the context of postpartum outcomes. Of most relevance to this paper, recent studies have discovered a positive association between ACEs (i.e. physical, emotional, and sexual abuse, and neglect) and later postpartum depression (Choi & Sikkema, 2016; Choi et al., 2018; Mersky & Janczewski, 2018; Seng et al., 2013). ACEs may play a particularly important role in PPD/A because motherhood frequently triggers memories and a review of one's own childhood experiences. For women who have had ACEs, the transition to motherhood may be fraught with challenging cognitive and emotional responses that may be identified as PPD/A (Sperlich, Seng, Li, Taylor, & Bradbury-Jones, 2017).

Previous studies examining the link between ACEs and postpartum mental health have focused on the predictors of child maltreatment in the form of physical, emotional, and sexual abuse and physical and emotional neglect (see Choi & Sikkema, 2016; Choi et al., 2018; Mersky & Janczewski, 2018; Seng et al., 2013). Certainly these ACEs have a significant impact on health outcomes. However, other ACEs (i.e. parental mental health and substance abuse problems, incarceration, death, and divorce) can also play a role in poor health outcomes in adulthood (Felitti et al., 1998; Nurius et al., 2016). Additionally, less studied ACEs (i.e. discrimination, economic hardship, and forced migration or deportation) should also be considered as having a potential influence on adult health.

Thus, the current study examines a wider range of ACEs when compared to previous studies of PPD/A.

Social Support, Material Hardship, Discrimination, and Postpartum Mental Health

Mothers' satisfaction with their emotional and material social support network has been repeatedly found to be associated with more positive mental health postpartum (Aktan, 2012; Muzik, Umarji, Sexton, & Davis, 2017; Negron, Martin, Almog, Balbierz, & Howell, 2013; Razurel, Kaiser, Sellenet, & Epiney, 2013; Webster, Nicholas, Velacott, Cridland, & Fawcett, 2011). Furthermore, social support has emerged as a powerful, protective moderating variable in various studies examining the influence of discrimination on physical and mental health outcomes broadly (Pascoe & Smart Richman, 2009). While material hardship and discrimination have been much less studied in the perinatal period, both have been found to predict poorer health-related outcomes and represent proposed social and economic drivers of health disparities (Williams & Mohammed, 2009; Williams & Mohammed, 2013).

Perceived discrimination among racial minority women is associated with significantly lower infant birth weight, preterm birth, and small for gestational age infants (Alhusen, Bower, Epstein, & Sharps, 2016; Earnhaw et al., 2013). A longitudinal study out of New Zealand demonstrated that reported experiences of racial discrimination—over the previous year and cumulatively over the life course—among over 4,400 Māori, Pacific, and Asian women and their partners predicted PPD; mothers who experienced discriminatory treatment by a health care provider were 88% more likely to screen positively for PPD. One study of 1,233 low-income pregnant and postpartum Black and Latino women in New York City found a positive correlation between experiences of

discrimination and symptoms of depression and anxiety; moreover, anxiety symptoms were greater among those simultaneously reporting discrimination and food insecurity (Rosenthal et al., 2015). In a longitudinal study of postpartum women, those with high economic hardship reported significantly poorer mental and physical health; additionally; these women reported lower mental health related quality of life at 4, 8, 12, and 16 months postpartum when compared to women with low economic hardship (Tucker, Grzywacz, Leng, Randall Clinch, & Arcury, 2010).

Social support, experiences of discrimination, and material hardship were chosen for examination because they have been associated with some postpartum mental health outcomes in the literature—though the research specific to associations between discrimination, material hardship, and PPD/A is in its infancy—and because they represent noteworthy experiences and events that can significantly alter the life course. Further, these variables symbolize potentially modifiable factors that can be targeted to prevent and/or improve outcomes. Examining social support, discrimination, and material hardship as moderators will help elucidate whether or not these the presence or absence of these factors result in differing outcomes for mothers with and without ACEs. Given the information above, it is possible to consider that social support, and freedom from discrimination and material hardship may serve as buffers, reducing harmful effects of ACEs on postpartum mental health.

Theoretical Approach

This study was informed by life course theory and liberation health social work. In hypothesizing the interrelationships between variables, life course theory was used to consider the potential latent, pathways, and cumulative effects of ACEs over time as well

as the potential influence of social support, discrimination, and material hardship on life trajectories and later postpartum health outcomes (Elder, Johnson, & Crosnoe, 2003; Hutchinson, 2011). Thus, it was hypothesized that ACEs, via various mechanisms, could put women at increased risk of poor postpartum mental health. Further, those experiencing low social support, discrimination, and material hardship could be more likely to experience worse outcomes. Liberation health social work (see Belkin Martinez & Fleck-Henderson, 2014) provided a framework for identifying the other various personal (e.g., personal and/or familial history of ACEs and mental health problems, personal beliefs about depression and anxiety, income and resources), cultural (e.g., mental health stigma, patriarchy, culture of individualism and parenting in isolation), and institutional (e.g., for-profit healthcare system, lack of federal paid parental leave, social determinants of health) factors that may serve to create or maintain poor postpartum outcomes. It provided a holistic approach for contextualizing PPD/A in context of the US social-political environment—in addition to individual factors, which remain the focus in more conventional approaches toward understanding and responding to mental health problems.

Research Questions

This study adds to the literature by examining understudied ACEs, and how factors such as inadequate social support, material hardship, and experiences of discrimination—which change during transitional periods of the life course (Rosenthal et al., 2015)—may aggravate the negative impact of ACEs on postpartum mental health outcomes, and uncover mothers' perceptions of risk and protective factors. Additionally, integrating quantitative and qualitative data elucidates potential pathways for future investigation of

these relationships. Improved understanding of the associations between ACEs and PPD/A can be used to advocate for policies and programs to better support pregnant and postpartum women. Accordingly, the following research questions were studied:

1. Are ACEs associated with PPD/A?
2. Do material hardship, experiences of discrimination, or social support moderate the association between ACEs and PPD/A?
3. Among women who reported high ACEs, how do lived experiences and insights about factors that may have influenced outcomes differ between those who did not experience PPD/A and those who did?
4. How do the quantitative and qualitative study findings converge and diverge when examining potential associations between ACEs and PPD/A?

Methods

The current study emerged from a larger project focused on examining an association between ACEs and four postpartum outcomes: (a) PPD; (b) PPA; (c) postpartum physical health; and (d) breastfeeding challenges. The study used a modified mixed methods explanatory sequential design—quantitative data was collected in phase I, followed by qualitative data collection in phase II (see Figure 4; Creswell & Plano Clark, 2018). Mixed methods designs allow researchers to collect both qualitative and quantitative data to increase study rigor and answer research questions in more depth and breadth. Additionally, this approach provides utility when researchers are interested in prioritizing the inclusion of participants' voices in the study (Creswell & Plano Clark, 2018).

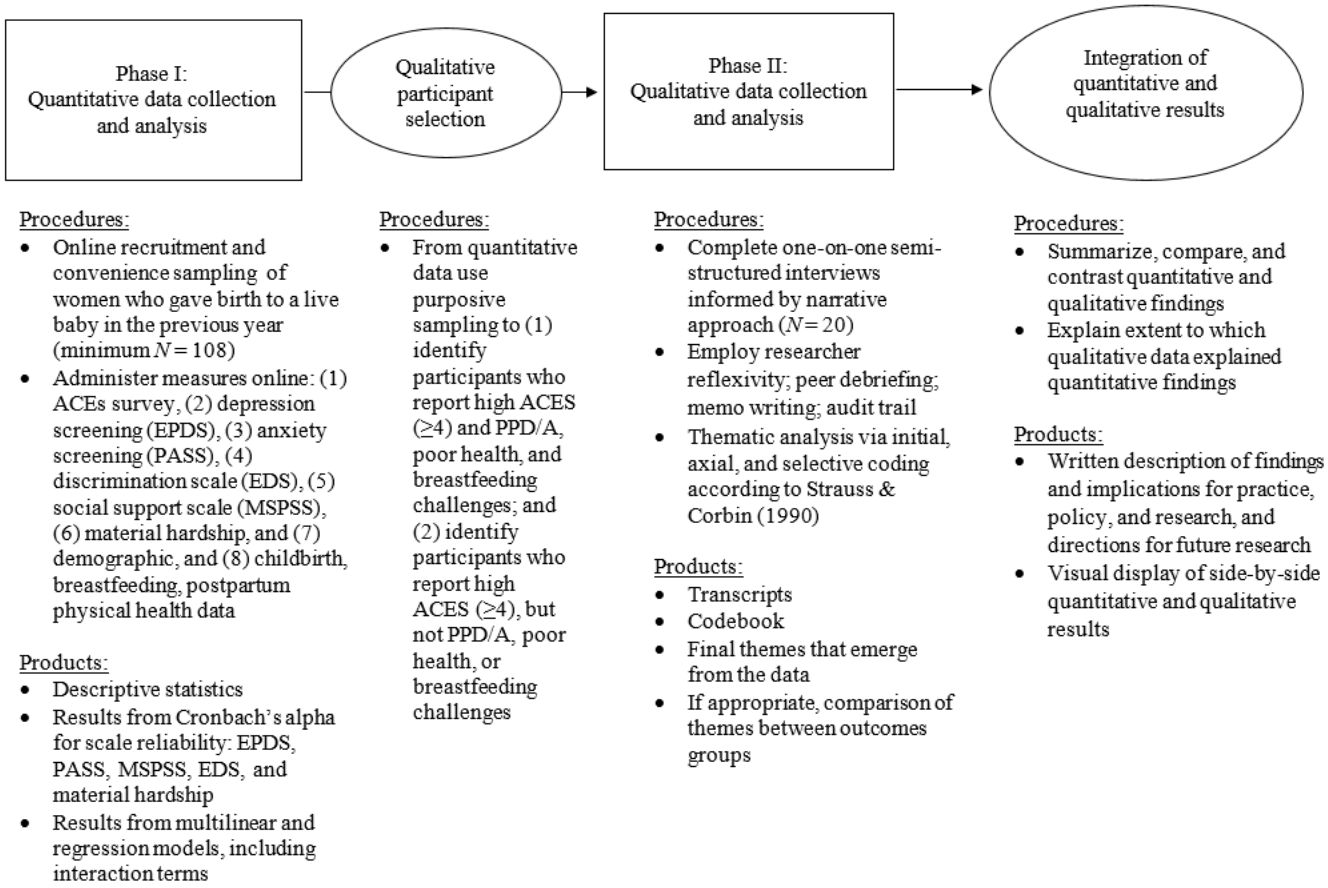

Figure 4. Modified mixed methods explanatory sequential design study diagram.

An explanatory sequential approach allows findings from the first method (i.e. quantitative) to inform and complement the second method (i.e. qualitative) (Shepard, Orsi, Mahon, & Carroll, 2002). This approach reduces researcher bias, improves reliability of the findings, and provides a more holistic and in-depth view of the results (Creswell & Plano Clark, 2018). Analyzing the qualitative and quantitative data individually and then making comparisons between them enables researchers to identify consistencies in responses between the data sets and whether or not responses reflect similar underlying content and connections between variables; moreover, this approach can enhance reliability and validity of research, allow for the possibility that the qualitative findings will validate and enrich the quantitative results, and/or identify noteworthy contradictions found between them (Hesse & Biber, 2010). In the current study, quantitative results from phase I were used to deliberately invite respondents to participate in individual interviews in phase II and then assess how well the qualitative data validated the quantitative findings. However, due to time constraints and a desire to elicit unbiased participant responses, phase I results did not inform the creation of the phase II interview guide, which was created prior to phase I data collection. Thus, the term "modified" mixed methods study is used.

Collecting both qualitative and quantitative data also reinforces social work values of inclusion, collaboration, empowerment, and the pursuit of human rights and social justice, consistent with this study's theoretical perspective. As societal and institutional factors can increase individuals' vulnerability to risk and harmful outcomes, mixed methods approaches allow for a systematic way to investigate such complex issues contributing to individual vulnerability (Shepard et al., 2002). Further, research is more

likely to be participatory, collaborative, emancipative, and inclusive of perspectives of groups typically marginalized when emphasizing the role of quantitative data (Creswell & Plano Clark, 2018; Hesse-Biber, 2010).

Data Collection and Sampling

This study was approved by the Behavioral and Social Sciences Institutional Review Board (IRB) at The Ohio State University. Informed consent procedures were followed and psychological safety protocols were implemented in the circumstance that participants experienced emotional distress as a result of study participation. Participants in phase I of the study were provided with contact information for Postpartum Support International (PSI)—a global organization that provides information and support for those experiencing emotional challenges during pregnancy and postpartum—and the National Suicide Hotline. Phase II participants were additionally offered contact information for their local PSI chapter.

The population of interest for this study included US women, age 18 and older, who delivered a live baby within the previous year. This represents the postpartum time period when women are mostly likely to experience negative consequences of childbirth including PPD/A. Efforts were made to recruit eligible participants across a range of ages, races, ethnicities, and incomes.

Phase I quantitative participants. Non-probability convenience sampling was used to recruit the sample of 306 participants. A minimum of 108 participants was required to achieve power of .90 ($\alpha = .05$) and to detect a small effect size (Cohen's $f^2 = .15$). Sample size was determined using G Power 3.1, a free statistical power analyses program (Faul, Erdfelder, Buchner, & Lang, 2009). Phase I participants were recruited to

complete an online survey via various outlets: a) ResearchMatch and StudySearch (online databases of study volunteers); (b) a Facebook page created for the purposes of the study and paid Facebook advertisements; (c) sharing electronic announcements and flyers with various online Facebook groups aimed at providing emotional support and information to postpartum women from diverse racial, ethnic, and socioeconomic backgrounds; and (d) emailing the researcher's previously established individuals contacts and agency and organizational representatives serving postpartum women.

Phase II qualitative participants. From phase I data, purposive and stratified sampling (Palinkas et al., 2015) was used to invite a strategically selected and diverse (e.g., age, income, race, ethnicity, and outcomes) subset of participants (n = 22) with ACEs scores of 4 or greater to participate in individual interviews in phase II. This included 11 participants in the "high" adverse outcomes group, who experienced three or four negative outcomes (i.e., PPD, PPA, poor postpartum physical health, and/or breastfeeding challenges), and 11 participants in the "low" adverse outcomes group, who experienced zero or one negative outcome(s). Individuals with two adverse outcomes were excluded from phase II recruitment to more easily discern differences between potential risk and protective factors influencing the extremes in outcomes.

The sample size corresponds with those of comparable studies of in-depth individual interviews with mothers (which used a range of 9 – 37 participants) (see Darvill, Skirton, & Farrand, 2010; Lakshman, Ogilvie, & Ong, 2009; Ward, 2015), met or exceeded the sample sizes recommended and used in most narrative studies, and allowed for saturation (Creswell, 2013; Guetterman, 2015). As the researcher conducting

the interviews was monolingual, participants were ineligible to participate if they did not speak English.

Phase I quantitative procedures. Quantitative data was collected through a cross-sectional, 30-minute online survey on (a) ACEs (including the original 10 core questions, as well as childhood experiences of discrimination, community violence, forced migration, and economic hardship); (b) depression (Edinburgh Postnatal Depression Scale); (c) anxiety (Perinatal Anxiety Screening Scale); (d) experiences of discrimination (Everyday Discrimination Scale); (e) social support (Multidimensional Scale of Perceived Social Support); (f) material hardship; (g) demographics; and (h) experiences related to childbirth, breastfeeding, and postpartum physical health. Upon completion of the online survey, participants were invited to enter their email address to receive a $10 electronic gift card incentive.

Phase II qualitative procedures. After garnering verbal consent, participants choose pseudonyms to protect their confidentiality, and in-depth interviews were conducted via telephone. Phone interviews allowed for greater access to a diverse sample of participants across the country and offered convenience to mothers with young children. A narrative and timeline approach informed the semi-structured, timeline interviews (Adriansen, 2012; Goodson, 2016) to elicit lived experiences and insights about factors across the life course that may have influenced postpartum outcomes. Questions inquired chronologically about participants' childhoods, relationships, recent experiences with pregnancy, labor and delivery, recovering from childbirth, breastfeeding, and any symptoms or experiences of PPD/A. Interviews took place from June – July 2019 and lasted approximately 60 minutes. The author conducted all

interviews which were recorded and later transcribed verbatim by an IRB-approved paid transcription service. Interview participants received a $30 electronic gift card incentive.

Measurement

Dependent variables. PPD was measured using the 4-point Likert-type, 10-item Edinburgh Postnatal Depression Scale (EPDS) (Cox, Holden, & Sagowksy, 1987). The EPDS is among the most commonly used tools for screening for PPD, takes approximately 5 minutes to complete, is free to use as long as authors are cited, has demonstrated reliability and validity with racially, ethnically, and socioeconomically diverse perinatal populations, and is available for use in 23 languages (Anderson, 2010; Chiu et al., 2017). Designed to be self-administered, Kaminsky and colleagues (2008) determined that the self-report EPDS and directed interview EPDS are equivalent screening techniques for postpartum depression. Scale items are ordinal and scored 0, 1, 2, or 3 based on severity of symptoms reported (0 = never; 3 = very often). Question numbers 3, and 5-10 are reverse scored. Total scores are determined by summing the scores from the 10 questions. Possible scores range from 0 to 30. A total score of 13 or higher indicated a positive screen for PPD (Matthey, Della Vedova, & Agostini, 2017). Cronbach's alpha for the sample was 0.89.

PPA was measured using the 4-point Likert-type, 31-item Perinatal Anxiety Screening Scale (PASS), developed by Somerville and colleagues (2014). This is newer self-report tool can be used to screen for high-risk of anxiety in English-speaking pregnant and women less than 1 year postpartum. The PASS is self-administered and item responses are ordinal and scored 0, 1, 2, or 3, indicating the frequency of symptoms experienced over the previous month (0 = not at all; 3 = almost always). A total score is

calculated by summing the items and a 26 or higher indicates a positive screen for PPA (Somerville et al., 2014). The Cronbach's alpha reliability of the PASS was 0.96.

Independent variable. The ACEs survey included 10 core questions from the original CDC-Kaiser Permanente ACE Study about physical, verbal, and sexual abuse, neglect, and household dysfunction experienced prior to 18 years of age (Felitti et al., 1998). Six additional ACEs questions specific to experiences of discrimination, community violence, war, deportation, migration, and economic hardship developed by the National Survey of Children's Health and the World Health Organization have been added to the core survey (CAHMI, 2018; WHO, 2018) to include a more comprehensive measure of ACEs. The 16 survey questions have binary (yes/no) responses. A cumulative count served as the ACEs score. The cumulative count was chosen, as opposed to creating categories of ACEs because studies have determined a dose-response relationship between the number of ACEs and subsequent health problems (Felitti et al., 1998; Metzler, Merrick, Klevens, Ports, & Ford, 2017).

Moderator variables.

Material hardship. Material hardship—a family's ability to meet its basic needs in the previous 12 months—is measured using 10 questions informed by the work of Mayer and Jencks (1989) which was later validated for use in the Survey of Income and Program Participation and FFCWS (Neckerman, Garfinkel, Teitler, Waldfogel, & Wimer, 2016). Example questions include: "did you not pay the full amount of rent or mortgage payments," "did you borrow money from friends or family to help pay bills," "were you ever hungry, but didn't eat because you couldn't afford enough food?" A final score is calculated as a proportion of yes responses (yes = 1; no = 0) out of 10 questions. Material

hardship was then turned into a binary variable (no experiences of material hardship = 0; 1 or more experiences of material hardship = 1). The Cronbach's alpha was 0.77 for the sample.

Social support. Social support was measured using the 12-question Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988; [MSPSS]). The MSPSS is a valid and reliable tool which allows respondents to rate their experiences of support received by family members, friends, and a significant other. Some sample items include: "There is a special person with whom I can share my joys and sorrows;" "My family tries to help me;" "I can count on friends when things go wrong." Item responses include a 7-point scale ranging from very strongly disagree (1) to very strongly agree (7). Tallying the items and dividing by 12 gives a total score. For this study, the MSPSS score was then dichotomized (a score of 0 – 5.0 = low social support (0); a score of 5.1 or higher = high social support) (Zimet, 2016). The Cronbach's alpha reliability of the MSPSS was 0.95.

Discrimination. The Everyday Discrimination Scale (short version; EDS) provides a valid and reliable 5-item measure of the frequency of perceived discrimination experienced based on any reason (e.g., ancestry, gender, race, religion, sexual orientation, etc.) (Sternthal, Slopen, & Williams, 2011). Some questions include: "In your day-to-day life how often have any of the following things happened to you? You receive poorer service than other people at restaurants or stores;" "people act as if they are afraid of you;" and "you are threatened or harassed." Respondents answer using a 6-point scale, never (0) to almost every day (5). A total EDS score is calculated by adding items responses. The variable was then dichotomized to represent differences between

infrequent and chronic discrimination (a score of 0 – 5 = low discrimination; a score of 6 or higher = high discrimination) (Williams, 2016). Cronbach's alpha for the sample was 0.82.

Control Variables. Covariates included participant age, race, marital status, history of depression, anxiety, and chronic physical health problems, parity/number of births, age at first birth, infant feeding type (breastfeeding, formula, or combination), type of birth (singleton or multiple), and history of child's admission to neonatal intensive care unit. These variables have previously established associations with PPD in the literature (see Gale & Harlow, 2003; Ghaedrahmati, et al., 2017; Milgrom et al., 2008). Age variables were treated as continuous. Number of births was a discrete variable. Race, marital status, infant feeding type, birth type, and history of depression, anxiety, and physical health problems were all categorical variables.

Analysis

Quantitative data. Data analyses were completed using the Statistical Pack for the Social Sciences (SPSS) Version 24 (IBM Corp., 2016) software program. Given the very small amount of missing data (n = 3 cases), listwise deletion was used. Descriptive statistics and analyses assessed for assumptions required for regression (i.e. linearity, homoscedasticity of residuals, no perfect multicollinearity) and Cronbach's alpha was calculated for each measure (EPDS, MSPSS, PASS, EDS, and material hardship) to assess for scale reliability. All continuous variables were mean centered and interaction terms were created using ACEs and each potential moderator (i.e., social support, material hardship, and experiences of discrimination) to test for interaction effects. Two multiple linear regression models were performed (one for each outcome) to examine the

association between ACEs and PPD/A. Hierarchical entry was used and control variables were entered first, followed by ACEs, followed by material hardship, social support, and discrimination, and lastly, the interaction terms.

Qualitative data. Completed transcripts were uploaded into NVivo Pro 12 for Windows software (QSR International, 2018) for analysis. Participant demographics and characteristics were also entered into the program to create descriptive data points using the case classifications feature. High adverse outcomes group data were coded first, followed by low adverse outcomes group data. This allowed for constant comparison between the codes and groups and increased ability to identify similarities and differences between codes across groups. A codebook was created in Microsoft Excel using recommended guidelines for structural coding to narrow down the large amounts of data in favor of focusing on the particular research questions of interest (MacQueen, McLellan-Lemal, Bartholow, & Milstein, 2008). Thematic analysis via the use of open, axial, and selective coding were used to analyze the data (Saldaña, 2015; Strauss & Corbin, 1990). After reading through the transcripts to get refamiliarized with the data, open coding allowed for initial identification of key categories and concepts related to the research questions that arose from the data. Next, in axial coding these codes were compared and contrasted to one another, identifying subcategories, and refining them. Lastly, in selective coding, the final coding themes were identified.

A PhD-level research assistant was hired to also independently code all the transcripts using the existing codebook. We met every few weeks to discuss the data analysis process and to assess similarities and differences in coding and consistency in application of the codebook. Clarification of the few discrepancies that existed were

made and reflected in codebook adjustments. Identification of final codes were made by consensus. To increase rigor and trustworthiness of the study, memo writing, research reflexivity, peer debriefing, negative case analysis, and maintenance of a detail auditing trail were used (Creswell & Miller, 2000; Morse, 2015). Both researchers maintained independent records of their data analysis process and coding decisions, questions, and reflections.

In terms of practicing researcher reflexivity, I recognized that my identity as a White doctoral student researcher could impact participants' comfort and willingness to share their experiences with me (Berger, 2015; Dodgson, 2019). Additionally, my social position and personal culture affected all aspects of this research study, including the language used in forming the interview guide. This factor may have influenced communication and subsequent information and findings garnered from participants. To reduce some of these potential barriers, I consulted regularly with a supervisor well-versed in qualitative research, conducted a semi-structured interview guide to encourage participants to drive the focus of the content most relevant to their experience, allowed for some self-disclosure related to how I became involved in this research when participants inquired, reflected back to patients use of the language they used to describe their experiences from a position of unconditional warmth and positive regard, and remained vigilant of my potential biases through data analysis.

Data integration. Qualitative and quantitative data were compared, contrasted, and integrated to explore the similarities and differences in the data. The integrated data were summarized using a visual side-by-side comparison—a joint display—to examine if and how the phase II qualitative themes aligned or diverged from the phase I quantitative

results, and make final conclusions about how well the qualitative data explained and gave context to the quantitative findings (Creswell & Plano Clark, 2018).

Results

Descriptive Statistics

See Table 4.1 for demographics of the phase I, quantitative sample ($N = 306$). Mothers' average age was 31.06 years (range: 19 – 44). The large majority of the sample was married or partnered and had graduated college. In terms of employment status, 49.02% were working full-time, 20.91% part-time, and 33.07% identified as a homemaker or said they were not currently working outside the home. The majority of the sample was White (66.34%), 16.34% were Black or African America, 11.11% were Hispanic or Latina, 4.90% were Biracial, and 4.92% identified as Asian American or Native American. The median yearly income was $54,000 (range: $6,000 - $126,000).

Table 4.1. Phase I Participant Demographics ($N = 306$)

Notes: NA = Native American/American Indian; HS = high school diploma

Characteristic	*n* (%)	*M (SD)*	Range
Mother's Age		31.06 (4.94)	19 - 44
Poverty Ratio		.75 (.49)	.02 – 2.31
Number of Children		1.81 (1.00)	1 - 6
Marital Status			
Single, Separated, Divorced	33 (10.78)		
Married	245 (80.06)		
Partnered	28 (9.15)		
Race and Ethnicity			
Black or African American	50 (16.34)		
Hispanic or Latina	34 (11.11)		
White or Caucasian	203 (66.34)		
Other (includes Asian & NA)	12 (3.92)		
Biracial	15 (4.90)		
Education			
Less than HS – HS diploma/GED	24 (7.84)		

Some College or Tech School	59 (19.28)
College Graduate or More	223 (72.87)
Employment Status	
Full-time	150 (49.02)
Part-time	64 (20.91)
Homemaker	63 (23.59)
Not Working	29 (9.48)

Continued

Table 4.1. Phase I Participant Demographics, continued table

Table 4.2 displays the independent, dependent, and moderator variable scale scores. The mean ACEs score was 3.26 and over 80% of the sample reported at least one ACE. A high ACEs score (≥ 4) was recorded for 41.83% of the sample. Over a quarter of the sample (26.80%) screened positive for PPD and 41.83% screened positive for PPA. The majority had good – excellent physical health (92.81%), 72.22% of the sample who attempted breastfeeding reported difficulty doing so, 24.34% reported lower levels of social support, 35.29% experienced discrimination, and 46.73% met the criteria for material hardship.

Table 4.2. Phase I Independent, Dependent, and Moderator Variable Scores (N = 306)

Notes: ACEs = adverse childhood experiences; PASS = Perinatal Anxiety Screening Scale; EPDS = Edinburgh Postnatal Depression Scale; [1]n = 304 for this measure due to missing data; [2]Calculated among the n = 290 who attempted breastfeeding

Scores	*n* (%)	*M (SD)*	Range
ACEs		3.26 (2.94)	0 – 14
Score = 0	61 (19.93)		
Score = 1 – 3	117 (38.23)		
Score ≥ 4	128 (41.83)		
Discrimination		.95 (.89)	0 – 5
High	108 (35.29)		

Low	198 (64.70)		
Material Hardship		.13 (.19)	0 – .90
High	143 (46.73)		
Low	163 (53.27)		
Social Support[1]		5.60 (1.22)	1 – 7
High	230 (75.58)		
Low	74 (24.34)		
Physical Health		3.65 (.84)	1 – 5
Good – Excellent	284 (92.81)		
Poor - Fair	22 (7.19)		
Breastfeeding Challenges[2]		2.42 (1.96)	1 – 9
Yes	220 (72.22)		
No	70 (27.78)		
PASS (Anxiety)		25.46 (18.01)	0 – 88
Positive Screen	128 (41.83)		
Negative Screen	178 (58.17)		
EPDS (Depression)		8.63 (5.82)	0 – 29
Positive Screen	82 (26.80)		
Negative Screen	224 (73.20)		

Continued

Table 4.2. Phase I Independent, Dependent, and Moderator Variable Scores, table continued

Multiple Linear Regression

See Table 4.3 for the hierarchical linear regression model results reported by block entry. The second model (control variables and ACEs score) explained 22.91% of the variance in outcomes for PPD, $F(13, 290) = 6.63$, $p \leq .001$ and 29.10% of the variance in outcomes for PPA, $F(13, 289) = 9.13$, $p \leq .001$ and demonstrated that ACEs were positively associated with PPD ($\beta = 1.29$, $p \leq .001$) and PPA ($\beta = .27$, $p \leq .05$). However, the effect of ACEs disappeared in model 3 when the three moderator variables were added—all of which were statistically significant predictors of PPD/A. Social support, discrimination, and hardship explained 14% more of the variance in PPA and 19% more

of the variance in PPD above and beyond the variance explained by ACEs. Both final regression models (model 4) were statistically significant and fit the data well. The final block results explained 42.8% of the variances in outcomes for PPD, $F(19, 284) = 11.19$, $p \leq .001$ and 43.5% of the variance in outcomes for PPA, $F(19, 283) = 11.48$, $p \leq .001$. No interactions were found. Discrimination ($\beta = 8.93$, $p \leq .001$, 95% CI [3.13, 14.72]; $\beta = 3.61$; $p \leq .001$, 95% CI [1.75, 5.47]), material hardship ($\beta = 9.47$, $p \leq .001$, 95% CI [3.90, 15.04]; $\beta = 2.54$; $p \leq .01$, 95% CI [.74, 4.34]), and social support ($\beta = 5.83$, $p \leq .01$; $\beta = 2.72$; $p \leq .001$, 95% CI [1.40, 4.03]) were all statistically significant predictors for both PPD and PPA, respectively. Compared to women who did not report these factors, those that did were more likely to experience PPD and PPA. Additionally, mothers identifying as Black or African American ($\beta = -5.77$, $p = .02$), and Asian or Native American ($\beta = -10.05$, $p = .02$) were less likely to meet the criteria for PPA, but not PPD, when compared to White mothers. A prior history of depression and anxiety were also significant predictors of PPD/A.

Table 4.3. Hierarchical Linear Regression Analyses for Postpartum Anxiety ($N = 303$) and Depression ($N = 304$)

Notes: Hx = history; NICU = neonatal intensive care unit; ACEs = adverse childhood experiences; PPD = postpartum depression; PPA = postpartum anxiety; *$p < .05$. **$p \leq .01$.
***$p \leq .001$

	Model 1				*Model 2*				*Model 3*				*Model 4*			
	PPA		PPD		PPA		PPD		PPA		PPD		PPA		PPD	
	B	*SE (B)*	*B*	*SE (B)*	*B*	*SE (B)*	*B*	*SE (B)*	*B*	*SE (B)*	*B*	*SE (B)*	*B*	*SE (B)*	*B*	*SE (B)*
Mother's Age	-0.40	0.32	-0.06	0.11	-0.39	0.32	-0.05	0.11	-0.33	0.29	-0.04	0.09	-0.32	0.29	-0.03	0.09
Black/African American	-1.25	2.82	1.51	0.93	-2.11	2.76	1.29	0.92	-5.67*	2.53	-0.09	0.82	-5.77*	2.54	-0.03	0.82
Other Race (Asian, NA)	-11.17	4.74	-2.72	1.57	-10.33	4.63	-2.55	1.55	-9.70*	4.18	-2.30	1.35	-10.05*	4.22	-2.38	1.37
Biracial	2.17	4.39	-0.24	1.45	0.98*	4.29	-0.49	1.44	-0.37	3.88	-0.96	1.26	-0.02	3.92	-0.73	1.27
Not Married	3.49	2.65	0.46	0.87	2.77	2.60	0.28	0.87	-0.83	2.39	-1.10	0.77	-0.37	2.41	-1.02	0.78
Age at First Birth	-0.46	0.33	-0.09	0.11	-0.35	0.33	-0.07	0.11	-0.28	0.29	-0.04	0.10	-0.28	0.30	-0.04	0.10
Number of Births	-1.18	1.24	-0.04	0.41	-1.33	1.21	-0.07	0.41	-1.96	1.10	-0.31	0.35	-1.88	1.10	-0.30	0.36
NICU Admission	3.49	2.84	0.63	0.94	4.08	2.78	0.74	0.93	3.59	2.51	0.55	0.81	3.29	2.53	0.56	0.82
Infant Feeding Type	-1.39	1.90	-1.16	0.63	-0.79	1.86	-1.03	0.63	-0.06	1.69	-0.75	0.55	0.26	1.72	-0.61	0.56
Hx of Depression	8.86***	2.36	2.79***	0.78	8.02***	2.32	2.52	0.78***	8.17***	2.09	2.55***	0.68	8.12***	2.09	2.53***	0.68
Hx of Anxiety	7.39**	2.33	2.35**	0.77	6.31**	2.29	2.12	0.77**	4.77*	2.08	1.54*	0.67	4.51*	2.09	1.48*	0.68
Hx of Health Condition	0.45	2.03	-0.08	0.67	0.28	1.98	-0.10	0.66	-0.17	1.79	-0.25	0.58	-0.02	1.79	-0.21	0.58
ACEs Score					1.29***	0.33	0.27*	0.11	0.50	0.32	-0.03	0.10	0.45	0.51	-0.14	0.17
Discrimination									9.00***	1.85	3.23***	0.60	8.93***	2.94	3.61***	0.95
Material Hardship									7.93***	1.93	2.92***	0.62	9.47***	2.83	2.54**	0.92
Social Support									6.50***	2.02	2.86***	0.65	5.83**	2.06	2.72***	0.67
ACEs*Discrimination													0.00	0.64	-0.12	0.21
ACEs*Material Hardship													-0.43	0.67	0.14	0.22
ACEs*Social Support													1.08	0.70	0.27	0.22
R2	0.25		0.21		0.29		0.23		0.43		0.42		0.44		0.43	
R2 change	0.25		0.21		0.04		0.19		0.14		0.19		0.01		0.01	

Qualitative Findings

See Table 4.4 for a summary of sample characteristics of the 22 individuals who participated in interviews; data is organized by outcomes group. The groups were quite similar in terms of age, race, relationship status, US region of residence, education, income, and employment, but differed in terms of the number of negative postpartum health-related experiences. Four primary themes emerged from the data, including (a) social support; (b) economic factors; (c); work-related factors; and (d) self-care. Each theme is discussed below and supported by corresponding quotes from participants, identified using their pseudonym initials. Differences between the outcomes groups—according to each theme—are also described.

Table 4.4. Phase II Participant Characteristics by Outcomes Group (n = 22)

Notes:*Participants self-identified and could choose multiple categories. US refers to United States; Regional divisions defined by the US Census Bureau; PASS = Perinatal Anxiety Screening Scale; EPDS = Edinburgh Postnatal Depression Scale

	0 – 1 (Low) Adverse Outcomes (n = 11)		3 – 4 (High) Adverse Outcomes (n = 11)	
Characteristic	*n*	%	*n*	%
Maternal Age (*M = 29.77)*				
21 – 25	1	9.09%	4	36.36%
26 – 30	4	36.36%	3	27.27%
31 – 35	3	27.27%	2	18.18%
36 – 40	3	27.27%	2	18.18%
Race/Ethnicity*				
Asian	0	0.00%	2	18.18%
Black	5	45.45%	4	36.36%
Hispanic	1	9.09%	3	27.27%
Native American	2	18.18%	0	0.00%
White	5	45.45%	6	54.55%
Relationship Status				
Single	2	18.18%	3	27.27%
Married	9	81.82%	8	72.73%

Education Level				
High school diploma or equivalent	1	9.09%	1	9.09%
Some college	3	27.27%	4	36.36%
College graduate or more	7	63.64%	6	54.55%
Employment Status				
Full-time	5	45.45%	6	54.55%
Part-time	3	27.27%	1	9.09%
Not working outside the home	3	27.27%	2	18.18%
Student	0	0.00%	2	18.18%
Region of Residence				
US: Northeast	1	9.09%	0	0.00%
US: Midwest	1	9.09%	3	27.27%
US: South	7	63.64%	5	45.45%
US: West	2	18.18%	3	27.27%
Annual Household Income (M = $44,181)				
<$25,000	5	45.45%	6	54.55%
$25,000 - 49,999	3	27.27%	3	27.27%
$50,000 - 74,999	1	9.09%	0	0.00%
$75,000 - $99,999	2	18.18%	2	18.18%
Mental Health				
Positive PASS screen	0	0.00%	10	90.91%
Positive EPDS screen	0	0.00%	11	100.00%
Attending counseling	2	18.18%	2	18.18%
Taking medication	3	27.27%	3	27.27%
Chronic Physical Health Condition	3	27.27%	4	36.36%
Breastfeeding Challenges	6	54.55%	11	100.00%

Continued

Table 4.4. Phase II Participant Characteristics by Outcomes Group, continued table

Social support. Participants commonly reported that either social support helped or a lack of adequate social support hurt their postpartum adjustment and mental health.

High adverse outcomes group. Mothers with multiple negative postpartum health outcomes frequently noted that a lack of social support or inadequate support contributed to their

postpartum struggles. Participants described a lack of connection with family and friends and/or troubling isolation. Some described these experiences as a change in relationships that occurred postpartum and said that others did not understand their situation and needs, or because of the demands of childrearing it was more difficult to talk and visit with loved ones. NB (age 32, 1 child) said, "I guess I expected people to be more around and helpful and just be excited about the baby. I guess it's hard because I don't actually have that." Other mothers noted that they had social support, but not the kind of support they needed or desired. LM (age 21, 2 children) spoke about the emotional pain she experienced by not having the relationship with her mother that she wanted:

> "…the one person I wanted to connect to, have as my support—you always see in the cute movies, the mom always comes over and helps the daughter that just had the baby or she's there for her—I yearned for that bond and that connection with my mom…I just didn't get that. I think that weighs on my heart a lot."

Low adverse outcomes group. Conversely, these mothers acknowledged that social support in terms of helpful partners, completing household chores, paid and volunteer childcare assistance, and emotional connection were instrumental in their positive postpartum adjustment. EF (age 32, 1 child) noted:

> "…My support system—my husband and my mom and my family and having an amazing group of people in my life, even my work—my boss refers to herself as my daughter's extra grandma. Just having really amazing people here to help me, basically, and I know I wouldn't…be as successful as I am if not for all of them and knowing that they're there for me."

Economic factors. Economic factors notably affected mothers' postpartum adjustment and mental health. Participants explained that financial responsibilities influenced the ability to afford childcare and basic needs, and decision-making about whether or not one or both parents could take unpaid time off (and how much) postpartum.

High adverse outcomes group. Participants in the high adverse outcomes group reported substantial financial stress that contributed to prenatal and postpartum stress. LM (age 21, 2 children) explained monetary burdens that started in pregnancy and continued through 11 ½ months postpartum:

> "I didn't enjoy a lot of that pregnancy because I wasn't in any kind of place [financially] to give another child what they wanted…child care is outrageous…We were getting some government assistance at the time to help out with things. Then I went on maternity leave, and we had no income. That was hard. I was almost three months behind on my car payments, so it was—what was I gonna do if I lost my car? We did stress about it a lot…I did end up getting my car repossessed about a month ago because it was just a bill we weren't able to catch up on from everything that had gone on after I had the baby and not working after then."

JC (age 27, 2 children) said that she returned to work sooner than she had hoped postpartum because of financial concerns and the inability to subsist with unpaid time off, "I needed to make sure that the bills were gonna be taken care of...I don't wanna be a stay-at-home-mother, but I would've loved a couple more months with her."

Some mothers explained that it was more costly to pay for childcare when compared to their income; as a result, some left their jobs to care for their children full-time. When asked

about her biggest challenges, RH (age 36, 2 children) said, “Mostly financial…trying to make ends meet, trying to be a stay-at-home mom with kids…buy a home on just my husband’s salary.” A few mothers explained that financial factors served as barrier to accessing mental health care. SV (age 24, 1 child) commented:

> “For the therapist, I stopped because…I didn't have a lot of money at the time and I wasn't sure if I was gonna get an income anytime soon, so I just stopped going 'cause it was a lot of gas money.”

Low adverse outcomes group. Mothers doing well postpartum were less likely to talk about financial issues at all. While some did acknowledge the increased cost of having a child, they did not discuss it in the context of causing significant worry or burden. A few participants acknowledged that they thought they may be better off financially than others. VP (age 33, 4 children) said that she felt financial security was a protective factor for her: “We have a savings account. *[Laughs]* I've never felt we've been in—‘Oh no, if I were to lose my job, it'd be terrible.’”

Work-related factors. Participants reported that various work-related issues or changes were helpful or unhelpful (and even stressful or harmful) in their postpartum adjustment and/or mental health. In both groups, most mothers talked about efforts to balance work and family life and the desire to work outside the home less. BM (age 27, 4 children), who was both working and attending college part-time, said that her constantly changing work schedule interfered with her attempt to access mental health counseling:

> “My biggest challenges right now is trying to balance work and home life…it’s kinda like one week I’ll work 15 hours, and then the next week I’ll work 30 hours…just learnin’ how

to also balance my mental health. It was just like oh, I'm gonna go to counseling just once a week and now it's like more stuff will pile on…It's work. It's kids. It's school, and it's everything…"

To the contrary, a few mothers said that they enjoyed returning to work because it helped them feel good about financially contributing to their family's needs and that it gave them a sense of competence, familiarity, and mastery, that they may have been struggling to find as a parent. VD (age 33, 1 child) said:

"…it's definitely challenging being a working mom, but I enjoy working. I feel like that gives me—that's the piece of me that I still have that hasn't changed. I came back to the same job. I'm doing the same thing, that feels like I know it, and it's predictable."

High adverse outcomes group. Mothers with postpartum mental health struggles reported difficulty in returning to work and meeting the demands of work and home life more often than those in the low outcomes group. Participants found themselves distracted by their family's needs while at work, related to securing safe and preferred child care arrangements, breastfeeding and milk expression, children's illnesses, limited sleep, and the desire to spend more time with their children. JG (age 40, 1 child) explained:

"I went back to work a few weeks after giving birth…it was such a weird transition to go back to work and trying to figure out how to do everything…I just always felt overwhelmed…I would say postpartum I thought I would be the super mom, but it is so much harder than I thought…I really struggle with trying to do everything…I struggle at work because I'm so exhausted. I'm still exhausted."

BB (age 31, 1 child), a mother whose child has a chronic health condition, said she felt badly about not being able to completely focus at work. But, she also made a point to highlight the unique support she received from her employer in trying to balance work and home responsibilities:

> "My work situation is, I think, probably very rare to what most people experience. My specific supervisor has been phenomenal….I had a lotta coworkers across the state donate leave to me…It turns into my sick time…one of the things I hope that your study will look at is the fact that it's not like that, that my case is extremely rare and that the postpartum support and time off and all that is abysmal and it's not there. It's sad…even though I'm back to work three days a week, I'm still, at the end of the day, not here that much because I'm always taking phone calls for [son] or making appointments…There's always something that comes up at work, so I feel guilty that I feel like when I'm at work, I'm not giving 100 percent at work, in a sense."

Low adverse outcomes group. Participants identified that having flexible work schedules, supportive supervisors and workplaces, and paid time off aided in their positive postpartum adjustment. EF (age 32, 1 child) said:

> "My work actually is very amazing, cause they are very understanding…granted, I can't just leave indefinitely for periods of time, but they have been so amazing and flexible with me if I've had to leave cause she's [daughter] been sick or had appointments or things come up. They have been amazingly helpful and fine with me leaving and acknowledge that family is more important than work, basically, and it should be that way."

Self-care. Participants reported that self-care activities improved their postpartum mood or that a lack of time for oneself hurt postpartum mental health and adjustment. Mothers in both groups said that prioritizing sleep, exercise, healthy eating, and/or hobbies helped them feel better. JG (age 40, 1 child) stated:

> "Exercise really helps me. It's my time…I brought a really great running stroller. I just put her in. I feel like alive again if that makes any sense. Even if it's not the distance that I used to do before, I just feel like myself again…Exercise is really I think my thing that really helps."

High adverse outcomes group. Mothers in the high adverse outcomes group more frequently noted a lack of time for oneself as a barrier to good health and mental health than those in the low outcomes group. Mothers reported longing for rejuvenating activities, time with other adults, and some time alone. SV (age 24, 1 child) stated:

> "The least [positive experience], I would say, is not having any me time, not being able to get all the things I want to get done in one day or now, not being able to go out with my friends anymore, my friends that used to go out partying and stuff."

Additionally, participants often felt they did not have the support or time that would allow for self-care and some noted feeling guilty or self-centered for wanting time to themselves. AD (age 28, 3 children) said, "I still feel like I should have that time where I'm just out by myself. I know that sounds selfish."

Low adverse outcomes group. Mothers spoke of self-care—both the presence and absence of—less often than the high outcomes group. However, a few did comment on making purposeful efforts for self-care via prioritizing one's individual interests and health behaviors. JS

(age 36, 2 children) said, “My vitamin D levels are good. I'm taking omega-3s. I need to get to sleep a little earlier, put the phone down…I'm trying to do all these things that you know are good for you.”

Integrated Results. See Table 4.5 for a joint display which shows how the quantitative measures and qualitative findings converged and diverged, as organized by results from the high adverse and low adverse outcomes groups. Overall, the qualitative data validated the quantitative data well and particularly highlighted the role of social support and material hardship and economic stability in influencing postpartum outcomes. The high adverse outcomes group had (a) a lower mean score on the MSPSS; (b) a higher mean score for material hardship; and (c) a higher mean score on the EDS than the low adverse outcomes group, indicating that they had lower social support, more material hardship, and more discrimination.

Where the findings diverged some were in terms of discrimination, work-related factors, and self-care. Experiences of discrimination did not emerge as a qualitative theme, but a few participants in the high outcomes group made comments related to racial stigma and bias in healthcare and mothering; on the contrary, no one in the low outcomes group referenced discrimination at all. The two final themes—work-related factors and self-care were not tested quantitatively but emerged as important influences on postpartum mental health symptoms.

Table 4.5. Joint Display: Similarities and Differences across Data Types by Phase II High and Low Adverse Outcomes Groups (n = 22)

Quantitative Measure	Adverse Outcomes Group	Scale Score (M)	Qualitative Theme	Quote
Multidimensional Scale of Perceived Social Support	High	4.53	Social Support	I just didn't have the support system that I needed…I just didn't know what to do or where to turn or who to talk to… People will just say, 'Okay, I'm gonna pray for you,' but they don't come by. They don't check on me, and they don't say, 'Hey, do you need anything for the kids? Do you need me to come sit with them while you take a shower or wash your hair?' –AD (age 28, 3 children)
	Low	6.01		… just havin' a system of women that it's just like almost like a lifeline of, "Hey, I'm gonna come to your house and while you sleep I help take care of your children." That was the positive thing for me…knowing that I do have people that care, and if I needed them that they will be there. –BM (age 27, 4 children)
Material Hardship	High	0.40	Economic Factors	Before baby, me and my husband did very well, middle class…Then daycare is my paycheck, which that used to go to bills. I'm like, 'Oh, shit. We are struggling.' I had to sign us up for food stamps. I had to get on WIC. It's literally I'm wondering if we're gonna pay our mortgage next month. How do we go from two people who are doing so well?...I was very happy. We could have lived like that for the rest of our lives… I just question, 'How do people who make above minimum wage, with two incomes not be able to survive by having one child?' It's not like I'm flipping burgers at McDonalds. I'm like, 'Why can't I survive? What's happening?" –BT (age 24, 1 child)

	Low	0.15		I have paid childcare…Now I realize we have the money to pay for help. I'm making him [partner] pay for help so that I don't go nuts. –JS (age 36, 2 children)
Everyday Discrimination Scale	High	1.58	*N/A: No Theme Emerged*	I'm part African-American. I never really wanted to be a stereotype, single mother, so that has affected to me in that…sometimes I get anxiety that my husband is cheating or that my husband's gonna leave me, even though he's not. I just don't ever, ever wanna be that single, African-American mother 'cause there's a lot of stigma with them. –SV (age 24, 1 child)
	Low	0.89		*N/A*
N/A	High	*N/A*	Work-related Factors	…I'm dealing with a lot of stress at work…It's just, trying to find the balance in that will get to me and stress me out…I work in a really small office, so it's not like I would have been protected by the laws that say, 'You have to give 'em this-many days off'…So, it was a really stressful time coming back to work then because I went back three weeks after having a baby. Then, I had to work through lunches. You know? Take on extra things, so I can make up that 40 hours I had taken off additionally. –SO (age 26, 1 child)
	Low			…it's definitely challenging being a working mom, but I enjoy working. I feel like that gives me—that's the piece of me that I still have that hasn't changed. –VD (age 33, 1 child)

Continued

Table 4.5. Joint Display: Similarities and Differences across Data Types by Phase II High and Low Adverse Outcomes Groups, continued table

	High			…they're [mothers in our family] very self-sacrificing which is, to a point, it's good, but then it's almost too much. I feel like I'm going on the same route where it's like you give your all, 100 percent, it's almost like nothing left for yourself…Like self-care, I definitely didn't do the self-care I needed...giving up my self-care for just meeting his [child's] needs and putting that first. –NB (age 32, 1 child)
N/A	Low	*N/A*	Self-care	I journal. I've been taking more time to read and trying to take more time to do things for myself...not necessarily when my daughter is taking a nap and trying to rush and get things done, but just saying, 'Here you go. Here's the baby. You got her. I'm going to do this,' and taking time for myself and even doing little things like painting my toenails or painting my nails or making homemade jam or sewing or doing a project—things that I used to do before I got pregnant that I wouldn't think twice about going and doing and working on finding me again versus just mom. –EF (age 32, 1 child)

Continued

Table 4.5. Joint Display: Similarities and Differences across Data Types by Phase II High and Low Adverse Outcomes Groups, continued table

Discussion

Using a more comprehensive measure of ACEs than recent maternal mental health research and a fairly diverse sample of postpartum women—in terms of race, ethnicity, and income—this mixed methods study showed that mothers' recent experiences of social support, discrimination, and material hardship had significant associations with PPD/A. Before adding these moderator variables to the model, there was a statistically significant relationship between mothers' ACEs and PPD/A, as has been established in other studies, which primarily examined the role of child maltreatment in absence of moderators (Choi et al., 2018; Choi & Sikkema, 2016; Mersky & Janczewski, 2018). However, the effect of ACEs on PPD/A dissipated once the additional variables were added into the model. This was one unexpected finding. The second was that no interaction effects were found between ACEs and each moderator variable. In sum, results from this study show that ACEs matter, but inadequate social support, discrimination, and material hardship may matter more.

These results invoke consideration of a kind of ranking of priorities similar to Maslow's hierarchy of needs (Maslow, 1943). In Maslow's theory, social support, discrimination, and material hardship would represent essential human needs for safety and belonging required for resiliency, healthy well-being, and reaching one's full potential. In this way, struggles related to social support, discrimination, and material hardship serve as current and more acute experiences of trauma that take prominence over past traumas—which still may be influential, but do not necessarily require immediate attention for survival. Further, it is possible that inadequate social support,

discrimination, and material hardship are particularly traumatic for women at this stage in the life course as they are not only managing their own needs, but are often primarily responsible for the needs of others—including partners and children—also.

In terms of corroborating this study's findings—specific to social support only—one recent longitudinal inquiry of 1,994 Canadian women found that ACEs and social support independently predicted PPD, using the EPDS, and that there was no interaction between social support and ACEs (Racine, Zumwalt, McDonald, Tough, & Madigan, 2019). Qualitative findings provided further support that financial security and social support serve as key protective factors influencing mothers' mental health and adjustment to motherhood. These conclusions are not entirely new as social support, race, income, and socioeconomic status have been well-established in the literature as associated postpartum mental health, and PPD, in particular (Ghaedrahmati et al., 2017). What is novel, however, is the separate examination of PPA as distinct from PPD and the illumination of the influence of ACEs in context of inadequate social support, and the under-investigated variables of discrimination, and material hardship. These variables appear to operate as powerful, current adverse experiences negatively which may influence mothers' mental health more considerably than ACEs. Additionally, the study intentionally assessed the effects of the phenomenon of discrimination and material hardship, rather than socially constructed identities (e.g., race, gender, social class, or sexual orientation).

Study findings also support life course theory and liberation health social work, illuminating the influence of various personal (e.g, ACEs, self-care), cultural (e.g., lack

of social support and parenting in isolation), and institutional factors (e.g., financial insecurity re: lack of paid parental leave and work-related factors) influencing health outcomes over the life course. Correspondingly, it is important to underscore the effect of Western culture on participants' interview responses. The fact that self-care emerged as a key theme may reflect the US culture of individualism, individual pathology, and self-responsibility where mothers are lauded for selflessness and self-sacrifice in favor of their families' needs. Mothers feel personally responsible for their experiences, circumstances, and health and view self-care as important, yet secondary to others' needs. Self-care is also related to social support. Having instrumental and emotional support from others can encourage positive health behaviors and allow for and represent a form of self-care. Yashna Maya Padamsee (2011), an activist in the Healing Justice movement (see Piepzna-Samarasinha, 2016) argues that the perpetuation of self-care as an individual practice is isolating and detrimental to well-being. This is particularly true for those with marginalized identities and those already struggling with mental health challenges. Alternatively, a move to community-care focuses on interdependence, fosters connection, and emphasizes a shared responsibility to support the wellness of others (Sambile, 2018). Thus, Western cultural values may serve to further isolate mothers who are in most need of connection and support. Community care practices provide an opportunity to reduce self-blame for one's circumstances, meet self-care needs via social connection with others, and ultimately create social change.

The theme of work-related factors—flexibility in work schedules, support in the workplace, and efforts to balance work and family—are closely related to the theme of

economic factors as many mothers in both groups expressed interest in working part-time or taking more time off if it had been financially feasible for their families. Mothers' narratives often reflected conflict between a commitment to working outside the home and a desire to spend more time with their children and manage other familial and household responsibilities. For most mothers this was further impacted by an ineligibility for and/or limited paid time off after childbirth and a financial need to work in order to make ends meet. This theme also highlighted the variability in mothers' preferences about if, when, and how much they would like to work in relationship to caring for their children postpartum. This was further complicated by mothers' who were struggling with symptoms of PPA/D, as some felt working was helpful to their well-being, while many others felt it was detrimental.

Though they were not explicitly asked about them, few participants mentioned larger political, cultural, and/or socioeconomic factors that may have influenced their well-being. An exception would be VP (age 33, 4 children), who attributed aspects of her native, collective culture as a reason she fared so well postpartum. She said:

> "For six weeks afterward…it's called in the Mexican culture the 40 days of sitting is what they call it. Basically, you're not allowed to get up. You're not allowed to clean, or cook, or do anything. Just basically you sit there, veg, and let the baby eat, and sleep when you sleep. Don't do anything but stay there basically. I've been privileged to be able to do that for at least six weeks minimum with all my kids."

Participants also rarely described experiences of discrimination during the individual interviews. In addition to Western cultural values previous mentioned, other

possible reasons for this include the fact that participants were not directly asked about these experiences, general discomfort that often accompanies discussing issues of bias and discrimination, and the decreased likelihood of participants discussing discrimination with an interviewer who may have been perceived as more privileged (e.g., White racial identity, involvement in academia).

Implications

Practice. Study results may inform preconception and perinatal counseling regarding the potential influence of ACEs and social and economic factors on postpartum mental health. Healthcare and social work practitioners may consider screening their perinatal patients for ACEs (see Flanagan et al., 2018), as well as assess for instrumental and emotional social support and risk factors such as financial insecurity, recent experiences of material hardship, and experiences of discrimination. This knowledge gives providers and perinatal women an understanding of the potential impact of these unique life factors and circumstances on postpartum adjustment and mental health. Additionally, using a trauma-informed approach, the information can assist in normalizing mothers' experiences as potential side effect of various adverse experiences and not individual pathology (Siverns & Morgan, 2019). Further, these discussions may serve as (a) an opportunity for education—that self-care and social connection is not a luxury, but a requirement for good mental hygiene; (b) a conduit for accessing mental health treatment, if needed; and (c) a symbol for a holistic approach to bolstering mothers' material resources, assets, and supports in an effort to prevent and/or minimize postpartum mental health struggles.

Policy. In order to affect change on a larger scale and remove the sole onus of responsibility for PPD/A prevention and recovery from mothers to broader society, policies and programmatic interventions to better support perinatal women, reduce healthcare disparities, and promote economic equality must be emphasized. Thus, the results of this study support advocacy and activism relevant to universal federal paid parental leave in the US, living wage ordinances, affordable housing, increased access to high-quality, affordable education, and large-scale efforts to dismantle institutionalized discrimination. Though there is a need for more longitudinal research on the effects of parental leave policies on maternal mental health outcomes, existing US-based research suggests that longer paid (more than 8 or 12 weeks, depending on the study) and unpaid maternity leave is associated with improved postpartum health and mental health, including reduced likelihood of PPD (Aitken et al., 2015; Chatterji & Markowitz, 2008; Dagher, McGovern, & Dowd, 2014; Kornfeind, & Sipsmam 2018). European studies have concluded that paid maternity leave policies may not only improve postpartum mental health—particularly for first-time and low-income mothers—but, also results in improved mental health into older age and allow for increased social and economic participation (Avendano, Berkman, Brugiavini, & Pasini 2015; Butikofer, Riise, & Skira, 2018).

Williams and Purdie-Baughns (2015), in their summary of policy and programmatic research related to health disparities, explain that increased household income, conditional cash transfer programs, increased access to education, improved housing conditions and housing vouchers have been associated with improved health and higher

levels of mental well-being, particularly among the most marginalized groups. While much more research is needed to discern the exact types and doses of programs that provide the most cost-effective and maximization of improving health outcomes and the mechanisms behind them, it is well understood that social, cultural, intuitional, and economic factors remain key drivers of health inequity and require intensive intervention. Additionally, innovative community-driven interventions—with help from the public and private sector—show promise in improving health and mental health outcomes through purposeful, grassroots efforts to improve social and environmental conditions in areas with largest health disparities (Baciu, Negussie, Geller, Weinstein, & National Academies of Sciences, Engineering, and Medicine, 2017).

Research. This study adds to the small, but growing body of literature acknowledging that PPA may be more common and more detrimental to postpartum well-being than PPD (Fairbrother, Janssen, Antony, Tucker, & Young, 2016; Goodman, Watson, & Stubbs, 2016). Future research should assess for PPA symptoms more readily and distinctly from PPD. Further, advanced psychometrics are required to assess the cultural sensitivity and application of PASS and other perinatal-specific anxiety tools on culturally diverse populations, as this study found that mothers identifying as Black, African America, Asian, or Native American were less likely than White women to meet the criteria for PPA, but not PPD.

Additionally, there is an absence of research observing the variables of ACEs, PPD/A, social support, discrimination, and material hardship among mothers over time. Longitudinal data analysis would shed light on how mothers with high ACEs and PPD/A

fare at different points of the life course and how this trajectory compares to women without these experiences. Further, such research designs would allow for research elucidating the mechanisms behind these associations and whether or not they operate through latent, pathway, and/or cumulative effects.

Limitations

Study limitations include a cross-sectional design which precludes causal interpretations of relationships between variables and non-randomized, convenience sampling which excludes participants without internet access and may suggest somewhat of a privileged sample. In terms of measures, all tools required self-report and retrospective recall which are subject to bias. It is also important to note that the EPDS and PASS are screening tools which may alert the need for a thorough assessment to confirm PPD/A; in and of themselves, they are not designed to be used as diagnostic tools. Additionally, responses to the EDS did not require participants to identify the type of discrimination they experienced. Future research may examine how different types of discrimination and the intersectionality of discrimination may affect postpartum outcomes. Lastly, the phase II interview guide was not guided by the phase I quantitative findings. Using the phase I quantitative findings to guide the phase II interview guide would have resulted in participants being explicitly asked about experiences of social support, material hardship, and discrimination, which may have provoked different responses.

Conclusion

Symptoms of PPD/A—the most common side effects of childbirth—can manifest in emotional and mental distress and impairment, poor parent-child and familial relationships, and children's developmental problems, and come at a substantial cost to families and larger society. Mothers with a history of ACEs may are at increased risk for PPD/A. Moreover, this mixed methods study found mothers reporting inadequate social support, discrimination, and material hardship—representing recent types of traumatic experiences—may be especially vulnerable to poor postpartum mental health outcomes. Mothers' lived experiences validated these results, highlighting the need for increased social support, financial stability, and time for self-care in the postpartum period. Findings can guide maternal health practitioners, policy makers, and researchers to develop micro- through macro-level prevention and intervention strategies to reduce perinatal health disparities.

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Chapter 5. Conclusion

This mixed methods dissertation is the first study to simultaneously examine the relationships between adverse childhood experiences (ACEs), social support, discrimination, material hardship, and four postpartum outcomes—self-rated physical health, breastfeeding challenges, and postpartum depression and anxiety (PPD/A). In this final chapter, major findings will be summarized and similarities and differences between results across the three separate manuscripts included in the dissertation will be discussed. After reviewing the study's primary strengths and limitations, the chapter concludes by describing the broad implications for these research findings in the context of social work practice, policy, and research.

Dissertation Findings

This dissertation research had three study aims:

1. To determine whether there was an association between ACEs and (a) self-rated postpartum physical health, (b) breastfeeding challenges, (c) PPD, and (d) PPA, and whether or not material hardship, discrimination, and social support moderated the associations;
2. To explore the experiences of postpartum physical health, breastfeeding, and PPD/A for women with high ACEs scores,

including potential risk and protective factors influencing outcomes; and

3. To integrate the quantitative and qualitative findings to provide a more comprehensive understanding of the associations between ACEs, self-rated postpartum physical health, breastfeeding challenges, and PPD/A.

The results were slightly different depending upon the specific outcome being studied. A summary of findings organized by outcome are outlined below.

Postpartum physical health. An association was found between mothers' ACEs and postpartum physical health. Further, material hardship was a statistically significant predictor of poorer self-rated postpartum physical health, and an interaction between ACEs and material hardship was discovered. These findings suggest that ACEs more negatively influenced physical health for mothers who did not experience material hardship. Said another way, for mothers who did report material hardship, ACEs did not have as strong of a negative effect on their postpartum physical health. Study results coincide with a body of literature linking (a) ACEs with poorer physical health, mental health, and disease (Felitti et al., 1998) and (b) material hardship with earlier death and poorer self-rated physical health in adulthood (Tucker-Seeley, Subramanian, & Sorensen, 2009; Tucker-Seeley, Harley, Stoddard, & Sorensen, 2013). However, this study is the first to establish an association between ACEs and postpartum physical health specifically.

Breastfeeding challenges. For mothers who attempted breastfeeding, no association existed between ACEs and the odds of experiencing any specific breastfeeding challenges. However, a statistically significant relationship was found between ACEs and the number of breastfeeding challenges experienced. Thus, as participants' ACEs score increased, so too did the amount of breastfeeding challenges they reported. Similar to the findings for postpartum physical health, material hardship was a statistically significant predictor of the number of breastfeeding challenges experienced, and an interaction between ACEs and breastfeeding challenges was revealed. These findings suggest that ACEs were more influential on the number of breastfeeding difficulties for mothers not reporting material hardship. Mothers who did report material hardship were not as negatively impacted by ACEs in reference to the number of breastfeeding difficulties reported. Neither discrimination nor social support were significant predictors in the model.

Study findings extend upon previous research that has demonstrated (a) a high frequency of breastfeeding challenges experienced by US mothers (Odom et al., 2013), regardless of ACE score; (b) a dose-dependent relationship between ACEs and poorer adult health behaviors and outcomes (Felitti, 2002); and (c) that mothers who experienced physical, emotional, and/or sexual abuse as children were more likely to report breastfeeding difficulties and less likely to still be breastfeeding at 6 months postpartum when compared to those without ACEs (Coles, Anderson, & Laxton, 2016; Elfgen, Hagenbuch, Görres, Block, & Leeners, 2017; Ukah, Adu, De Silva, & von Dadelszen, 2016).

PPD/A. The findings for PPD/A paralleled one another. An initial association was found between ACEs and PPD/A, but that effect dissolved after the introduction of the moderator variables under investigation. The final model indicated that social support, discrimination, and material hardship were statistically significant predictors of PPD/A. No interactions were found between ACEs and any of these three variables. These results imply that inadequate social support, material hardship, and discrimination have stronger associations with PPD/A than ACEs. Subsequent qualitative research resulted in four key themes: (a) social support, (b) economic factors, (c) work-related factors, and (d) self-care. Mothers cited a lacked of social support and and/or material hardship and economic insecurity as risk factors for PPD/A, further supporting the quantitative results. As an extension of these two themes, mothers' narratives highlighted work-related factors and self-care as key aspects influencing their postpartum mental health. Flexibility with work schedules, paid time off, and having a supportive work environment were noted as protective factors, while challenges in balancing work-family demands and commitments were identified as potential risk factors for symptoms of PPD/A. Mothers who met the criteria for PPD/A explained that a lack of time and support for self-care activities also contributed negatively to their mental health.

Recent studies have established an association between ACEs and poorer postpartum mental health (Choi et al., 2018; Choi & Sikkema, 2016; Mersky & Janczewski, 2018). However, this study challenges these findings in context of the roles of social support, discrimination, and material hardship. The author is unaware of other studies that have demonstrated a link between experiences of discrimination or material

hardship and PPD/A specifically. However, social support—as further validated by this study's findings—has been repeatedly established as a significant predictor of postpartum mental health outcomes (Muzik, Umarji, Sexton, & Davis, 2017; Negron, Martin, Almog, Balbierz, & Howell, 2013; Racine, Zumwalt, McDonald, Tough, & Madigan, 2019).

Unexpected Findings. There were a few unexpected results across each study. In the first study, it was hypothesized that poorer self-rated postpartum physical health would be found among mothers reporting ACEs, discrimination, and low social support. Instead, the only interaction found was between ACEs and material hardship. Overall, mothers tended to self-rate their postpartum physical health quite highly—in this study and others—despite having a chronic health condition and other postpartum physical health symptoms (Cheng & Li, 2008; Cooklin, Amir, Jarman, Cullinane, & Donath, 2015). It is possible that there were not enough participants in this study reporting poor physical health to demonstrate an effect. Discrimination and low social support were also reported less frequently than material hardship, which may have subdued any potential effects on the outcome.

In the second study, there was no association between ACEs and the likelihood of reporting breastfeeding challenges. However, when considering how common it is for women to experience breastfeeding difficulties, these findings make more sense. Breastfeeding—for numerous reasons—poses challenges that go far beyond ACEs and affect most women, regardless of their ACEs score. Similar to the first study, no interaction effects were found between ACEs and discrimination and low social support. Potential reasons for these unanticipated findings are the same as those noted in the

previous paragraph. Additionally, results show that Black/African American and biracial mothers had significantly lower odds of reporting more breastfeeding challenges than White women. Based upon existing research showing that racial minority women experience more barriers to breastfeeding—including a lack of information, encouragement, and support—it is conceivable that these women were less likely to have the information and connection with professionals needed to identify challenges that did exist (Jones, Power, Queenan, & Schulkin, 2015).

In the third study, contrary to the hypotheses, ACEs were not a statistically significant predictor of PPD/A once all the variables of interest were added to the hierarchical linear regression model. Further, no interactions were found between ACEs and social support, discrimination, and/or material hardship. These results are in contrast to a plethora of studies linking ACEs to poorer mental health outcomes in adulthood (Kalmakis & Chandler, 2015; Van Niel, Pachter, Wade Jr, Felitti, & Stein, 2014). However, the four variables of ACEs, social support, discrimination, and material hardship have not been previously studied in combination. These new findings suggest that recent experiences of inadequate social support, discrimination, and material hardship may function as current and more paramount traumas that require immediate attention over past ones.

Similarities and Differences across Studies. Looking collectively at the three individual studies, novel and important links were established between ACEs and the postpartum outcomes (postpartum physical health, breastfeeding challenges, and PPD/A). As expected, mothers who reported higher perceived social support and who did not

experience ACEs, discrimination, or material hardship fared better postpartum. The connections between ACEs and the postpartum outcomes were strongest however, between ACEs and postpartum physical health and ACEs and the amount of breastfeeding challenges reported. However, when it came to the outcomes of PPD/A, the effect of ACEs was lost when all variables of interest were added in the model.

Together, the studies most markedly underscored the influence of material hardship—a financial security measure assessing participants' ability to meet their family's basic needs within the previous 12 months—on postpartum outcomes. Material hardship was a significant predictor of all four outcomes and moderated the associations between ACEs and postpartum physical health and ACEs and the number of breastfeeding challenges experienced. Results also revealed consequential relationships between discrimination, material hardship, social support, and PPD/A. These findings were further validated by participants' narratives which also added points of consideration specific to mothers' desire for an improved work-life balance and time and support for self-care. Overall, study results point to the necessity of macro-focused prevention and intervention activities to better support perinatal health-related outcomes. These efforts—focused on the prevention and reduction of ACEs, experiences of discrimination, and material hardship, and bolstering of social support and connection—are particularly important for socially marginalized mothers in order to effectively disrupt social determinants of health.

Limitations

This dissertation has several limitations. Its cross-sectional and non-experimental design limits the study's internal validity. While the study results established an association between variables, confounders or other constructs that may be involved in affecting the postpartum outcomes cannot be ruled out. In terms of external validity, there is limited generalizability of the findings as online convenience sampling was used. Participants are thought to have some level of privilege in that they had sufficient internet access and time required to participate in the study. Furthermore, it is important to acknowledge that inclusion criteria for mothers in the study included self-identification as a woman, 18 years of age or older. It is assumed that the large majority of the sample was cisgender, female birth parents, thus excluding others (cisgender male fathers; adolescent parents; some sexual and/or gender minority parents; adoptive and foster parents) who may be also affected by some or all of the outcomes under study. Further, the second study focused on breastfeeding specifically, at the exclusion of other types of feeding (e.g., exclusive pumping; chestfeeding—a term used by some non-binary and transmasculine parents describing how they feed and nurture their children).

Due to time constraints and the intent to gather unbiased participant responses, the phase I study results did not inform the creation of the phase II qualitative study guide. If it had, the participants may have had different responses, and thus different themes may have emerged from the data. Although memo writing, researcher reflexivity, peer debriefing, negative case analysis, and a co-coder were employed to improve trustworthiness of the study, it is possible that the author was blind to additional bias in the interpretation of the qualitative data.

The ACEs, physical health, breastfeeding, EPDS (depression), PASS (anxiety), EDS (discrimination), MSPSS (social support), and material hardship surveys are all self-report measures and are, therefore, vulnerable to social desirability bias. As these tools collect private and potentially sensitive information, participants may under- or over-report symptoms and experiences. Additionally, recall bias has been identified as potentially problematic when asking participants to retrospectively report ACEs, resulting in some false positive responses (Colman et al., 2016; Hardt & Rutter, 2004). However, in a review of the validity of retrospective reports of ACEs, Hardt and Rutter (2004) discovered that individuals are more likely to under-report ACEs than over-report them. The researchers concluded that retrospective reports of ACEs are valid for use in epidemiological observation studies. Finally, it bears repeating that the EPDS and PASS are screening tools and were not designed to diagnose PPD/A.

Strengths

This modified mixed methods study, informed by liberation health social work and life course theories, investigated previously unexamined associations between ACEs and postpartum physical health, breastfeeding challenges, and PPD/A. To the author's knowledge, this dissertation provides the first studies specific to analyzing associations: (a) between ACEs and self-rated postpartum physical health; (b) between ACEs (beyond child maltreatment) and breastfeeding challenges; and (c) between ACEs and all four postpartum outcomes in the context of three factors—social support, material hardship, and experiences of discrimination. Additionally, integrating quantitative and qualitative data provided by a diverse sample of recently postpartum women elucidated some

potential risk and protective factors for postpartum outcomes. While recent studies have demonstrated an association between ACEs and postpartum mental health (see Choi et al, 2018; Choi, & Sikkema, 2016; Mersky & Janczewski, 2018), most focused on child maltreatment, while this study assessed for a broader view of understudied ACEs—including experiences of forced migration, community violence, discrimination, and financial hardship. The study also included particular attention to screening for PPA using a newer tool, the Perinatal Anxiety Screening Scale (Somerville et al., 2014), given the increasing recognition that PPA is more commonly experienced and represents a separate—though potentially overlapping—experience when compared to PPD (Fairbrother, Janssen, Antony, Tucker, & Young, 2016; Goodman, Watson, & Stubbs, 2016).

This study's mixed methods prospective cohort design contributes to knowledge building and is appropriate for the phase of translational research focused on understanding the epidemiology and etiology of various postpartum outcomes (Begun & Gregoire, 2014). Study results can be used to inform primary prevention strategies (e.g. policies and programs) targeted at improving postpartum health and mental health and related outcomes on micro-, mezzo-, and macro-levels. Historically, most postpartum mental health research has been reactionary and centered on minimizing individuals' symptoms, rather than halting the development of mental health conditions and seeking root-cause resolution. These dissertation findings contribute novel information to the knowledge base for the reduction of health inequities among postpartum women. Efforts to intervene in the prevention and treatment of poor postpartum outcomes will not only

improve the lives of mothers, but will also result in improved health outcomes for their children, and positively impact public health.

Implications

There are numerous implications of this research. More effective strategies for the prevention and intervention of poor postpartum health outcomes are required, as are alternative, non-pathology driven, culturally relative, liberation health focused interventions (discussed as part of the theoretical framework of this study) consistent with what we understand about influences on health across the life course, individuals' values, and social work's social justice mission (Dewees, 2002; Belkin Martinez & Fleck-Henderson, 2014). Suggestions for social work practice, policy, and research in context of the studies' findings are reported below.

Practice. As the primary provider of mental health services, social workers have an ethical mandate to understand and appropriately respond to the unique challenges of vulnerable populations, which include postpartum women. This includes acquiring knowledge about the intersections between social determinants of health—the cultural, socioeconomic, and environmental conditions that influence health—and postpartum physical health, breastfeeding experiences, and postpartum mental health outcomes. Such information can allow social workers to respond more holistically and effectively to mothers they may encounter through direct practice work.

Social workers and other healthcare providers may be moving toward screening patients—including perinatal ones—for a history of ACEs (Flanagan et al., 2018). However, there is some debate about whether or not this is a cost-effective and ethical

approach. Finkelhor (2018) argues that universal ACEs screening can be potentially harmful to individuals, creating unnecessary distress and negatively affecting relationships with care providers; additionally, evidence-based interventions to reduce the impact of high ACEs scores have not yet been identified and standardized screening could result in overtreatment. It may be more beneficial to first focus on understanding the mechanisms behind ACEs influencing health outcomes, as well as testing interventions designed to prevent ACEs.

In practice, then, it may be prudent for social workers to broadly inform mothers that they may be at higher risk for challenging postpartum health outcomes based upon a history of childhood adversities and more current social and economic burdens, but that these outcomes are not predestined. Social workers are in a position to help connect women—where appropriate—with information and resources to bolster their support systems and promote positive postpartum well-being. Such an approach also allows for a focus on resiliency and allows for normalizing the commonality of ACEs rather than pathologizing it.

Along these lines, CenteringPregnancy programs (Rising, 1998) were first established in the US in 1994 to provide group-based perinatal care through a focus on health assessment and identification of risks, education, and mutual support. In this model, participants learn information about pregnancy, nutrition, stress management, labor and delivery, breastfeeding, and newborn care in a setting with 8 – 12 other participants. Centering programs are designed to increase participants' active engagement in their healthcare, ownership of their health information, sense of competence, and overall

health and well-being. Social support and interaction between mothers are central components of this model.

A small, but growing number of studies suggest that CenteringPregnancy participants have more time with their care provider, fewer emergency room visits, higher rates of vaginal delivery, lower rates of preterm birth, increased breastfeeding initiation rates, higher perceived social support and quality of life, and increased equality of outcomes across race and ethnicity; however, more rigorous research using experimental designs are needed (Chae, Chae, Kandula, & Winter, 2017; Manant & Dodgson, 2011; Picklesimer, Billings, Hale, Blackhurst, & Covington-Kolb, 2012). Studies have not yet assessed the impact of Centering programs on maternal mental health, but prior research—including findings from this dissertation—suggest that group-models of prenatal and postpartum care may benefit postpartum physical and mental health outcomes.

Recently, there has been a growing focus on trauma-informed medical care and social services—ensuring that care is provided with the understanding of trauma and its sequelae in mind, creating a safe environment, avoiding re-traumatization and equipping patients with tools of self-empowerment for health and wellness (Levenson, 2017). This is a robust step in the right direction, but an approach called healing centered engagement (HCE) may allow for an even more holistic, strengths-based, and collective approach in line with prevention and root cause resolution of trauma, which often originates from systemic injustices (Ginwright, 2018). In line with results of this study, perinatal women may benefit from more collective and communal, as opposed to individually-focused

interventions, to increase social support and reduce isolation. Additionally, HCE affirms the need to address other social determinants of health—discrimination and material hardship—as sources of trauma.

Finally, it is vital to recognize that despite the commonality of adverse postpartum outcomes, the majority of women do not seek help with their postpartum struggles (Marcus, 2009; Wisner et. al., 2013). Some women have barriers accessing a care provider; others report receiving conflicting advice from friends, family, and medical professionals about how to manage symptoms and breastfeeding difficulties (Office of the Surgeon General, 2011). Additionally, since women are typically discharged from perinatal care at 6-weeks postpartum, they are likely to normalize their physical health symptoms as part of the childbirth experience and do not seek support for them (Cooklin et al., 2018). Some are fearful that their mental health struggles may be interpreted as an inability to provide appropriate care to their children, resulting in involvement with child protective services (Byatt, Biebel, Friedman, Debordes-Jackson, & Ziedonis, 2013) and others are uncomfortable with the most commonly prescribed conventional interventions such as prescription medication or psychotherapy (Battle, Salisbury, Schofield, & Ortiz-Hernandez, 2013; Bilszta, Ericksen, Buist, & Milgrom, 2010; Fonseca, Gorayeb, & Canavarro, 2015). For these reasons, mezzo- and macro-level prevention and intervention efforts are essential.

Policy. This study shows increased need for systematic strategies to prevent and reduce ACEs, discrimination, material hardship, and inadequate social support. These modifiable variables represent critical factors influencing postpartum health and mental

health and related disparities. Relatedly, a recent commentary in *The Lancet* written by public health researchers stated that empirical studies have overemphasized the independent role of ACEs in poor child health outcomes while inappropriately neglecting the influence of socioeconomic status and economic depravity (Taylor-Robinson, Straatmann, & Whitehead, 2018). As applied to postpartum women, acknowledging the role of ACEs is important and may allow for supportive supports and interventions; however, resources may be better spent focusing on the prevention of ACEs and bolstering the social and economic stability of perinatal women via policies and programs to help thwart the development of problematic postpartum outcomes.

There is evidence showing that positive economic mobility in adulthood can mitigate health risks (Luo & Waite, 2005; Yang, Gerken, Schorpp, Boen, & Harris, 2017). Thus, efforts toward eliminating material hardship and stabilizing financial security in childhood and adulthood may provide protective postpartum health benefits. Interventions and policies targeting increases in household income, improved housing conditions, increased access to quality education, and the dismantling of structural racism and sexism all show promise in improving economic stability and health (Williams & Purdie-Vaughns, 2015). Healthcare systems must commit to addressing the historical and ongoing implications of both personally mediated and institutionalized discrimination in order to improve outcomes and reduce social determinants of maternal health. Baum and colleagues (2009) cautioned that this work is not for the "fainthearted" and requires radical changes in leadership and stewardship. To facilitate equity-focused organizational culture change, the authors call for implementation of universal healthcare, health and

medical education reform concentrated on a commitment to closing the health equity gap, an emphasis on prevention, and that the communities affected by discriminatory care to be involved in organizations' decision-making processes.

Work conducted via the Robert Wood Johnson Foundation (Cook, Mahadevan, Clarke, & El-Shamaa, 2015) outlines six steps of its Equity Improvement Initiative to develop the capacity of healthcare organizations to create a culture of equity to reduce disparities. In it, the authors highlight nine healthcare organizations across four US states that participated in the initiative and provide best practices to reduce disparities. While none of the outcomes tracked were specific to postpartum or maternal health, some examples of findings showed that equity interventions improved understanding of care needs specific to Latinx and African Americans with diabetes, increased engagement with Somali patients, increased community partnerships, and resulted in the creation of diversity and inclusion strategic plans and conceptual frameworks for addressing disparities. This rich resource provides guidelines for other organizations to adopt and work toward changing organizational culture and reducing health disparities.

In addition to changes needed in healthcare policy and practice, research findings support increased attention and investigation toward giving mothers different options for paid time off that works for best for their unique needs and those of their families. As evidenced by this dissertation, some mothers prefer to return to work sooner postpartum, while others may require more time postpartum to rest, well establish breastfeeding, and recover their health and mental health. Additionally, flexible and part-time work options may be more conducive to postpartum adjustment and wellness for some. Regardless,

universal paid parental leave via US federal policy is prerequisite to ensure that all working mothers and their families have financial security during this vulnerable time in their lives. Additionally, although more research is needed, paid leave—and, in particular, longer leaves of more than 8 and 12 weeks—has been associated with better breastfeeding outcomes (Baker & Milligan, 2008; Burtle & Bezruchka, 2016) and better overall physical health and mental health in the postpartum period (Aitken et al., 2015; Chatterji & Markowitz, 2012; Dagher, McGovern, & Dowd, 2014; Kornfeind & Sipsma, 2018). Aside from the financial security that could come from universal federal paid leave, a movement toward universal healthcare, living wages, and expanded investment in programs for lower income families (e.g., Supplemental Nutrition Assistance Program, Temporary Assistance to Needy Families, and subsidized childcare) may reduce additional instances of material hardship and even prevent future ACEs (Cruz & Woelk, 2019; McKernan, Ratcliffe, & Iceland, 2018; Rodems & Shaefer, 2019).

Research. In general, maternal health and related outcomes are understudied and represent just 3% of the National Institutes of Health (NIH) budget, which primarily funds research on pregnancy and outcomes specific to maternal mortality, preterm birth, and infant mortality (Van Norman, 2019); breastfeeding represents a separate category of research that receives even less financial backing (NIH, 2020). Funding needs to be broadened to encourage more research on postpartum physical health, mental health, and breastfeeding outcomes, particularly as they relate to the experiences of minoritized populations and social determinants of health.

Future studies with larger and more diverse populations are needed to see if the findings from this dissertation can be replicated and to further investigate some of its unexpected findings. This would include ongoing screening and assessment of PPA symptoms in addition to PPD, as well as investigating how these symptoms present differently based on culture, race, and ethnicity. This would allow for improved development and application of PPA and PPD tools to ensure they are culturally sensitive and relevant. Additionally, research is particularly needed among marginalized groups and the experiences of those at the intersection of multiple oppressed identities.

Additionally, longitudinal data is absent from much maternal health related research. Collecting data from mothers at different points across the life course would offer a better understanding of the effect of ACEs, discrimination, inadequate social support, and material hardship on postpartum outcomes in the short- and long-term and how outcomes compare among those with and without these experiences. Further, it is important to consider that institutionalized discrimination and inequity can create conditions making ACEs, material hardship, and inadequate social support more prevalent (Cruz & Woelk, 2019). There is much work to be done to explicate the effects and mechanisms of relationships between these variables and maternal health outcomes. Lastly, as mentioned previously, there is a dearth of research identifying culturally appropriate and evidence-based practices, programs, and policies to prevent and reduce ACEs and experiences of discrimination, material hardship, and inadequate social support.

In conclusion, problems related to postpartum health, mental health, and breastfeeding experiences represent common challenges for women, their families, and

public health. Efforts toward increased understanding of mothers' ACEs, experiences of social support, discrimination, and material hardship are needed to effectively prevent and mitigate troubling outcomes and reduce health disparities. This study provides a step toward that goal by demonstrating newly established relationships between these variables and postpartum physical health, breastfeeding challenges, and PPD/A outcomes.

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Appendix A. Study Aims, Research Questions, Hypotheses, and Objectives

AIM 1 (*Quantitative*): To determine whether there is an association between adverse childhood experiences (ACEs) and (a) PPD, (b) PPA, (c) self-rated postpartum physical health, and (4) breastfeeding challenges, and whether or not material hardship, discrimination, and social support moderate the associations.

- *Objectives*: Conduct an online survey of a diverse cohort of postpartum women to retrospectively assess for experiences with ACEs and subsequent PPD, PPA, self-rated postpartum physical health, and breastfeeding challenges. The survey will also assess for material hardship, experiences of discrimination, and social support.

  Research Question #1: Are mothers' ACEs associated with PPD, PPA, self-rated postpartum physical health, and breastfeeding challenges?

  - *Hypothesis*: Higher ACEs scores will be associated with higher PPD and PPA scores, poorer self-rated postpartum physical health, and increased likelihood of breastfeeding challenges.

  Research Question #2: Do material hardship, experiences of discrimination, or social support moderate the association between ACEs and PPD, PPA, self-rated postpartum physical health, and breastfeeding challenges?

  - *Hypothesis*: The association between mothers' ACEs and PPD, PPA, poorer self-rated postpartum physical health, and increased likelihood of breastfeeding challenges will be stronger for those who report material hardship, experiences of discrimination, and lower social support.

AIM 2 (*Qualitative*): Explore experiences of PPD, PPA, postpartum physical health, and breastfeeding for women with high ACEs scores, including potential risk and protective factors influencing outcomes.

- *Objective*: Using a narrative approach to one-on-one interviews with postpartum women who reported high ACEs, investigate and describe the differences in lived experiences and perceptions about factors affecting outcomes between those who

experienced PPD, PPA, poor self-rated postpartum physical health, and breastfeeding challenges and those who did not.

> **Research Question #3:** Among women who reported high ACEs, how do lived experiences and insights about factors that may have influenced outcomes differ between those who did not experience negative outcomes (PPD, PPA, poor self-rated postpartum physical health, and breastfeeding outcomes) and those who did?

AIM 3 (*Integrated*): Integrate quantitative and qualitative findings to provide a more comprehensive understanding of the associations between ACEs, PPD, PPA, self-rated postpartum physical health, and breastfeeding challenges.

- *Objectives*: After analyzing qualitative and quantitative data separately and summarizing these results, data will be combined, consolidated, and triangulated to better understand the associations between ACEs, PPD, PPA, self-rated postpartum physical health, and breastfeeding challenges. The integrated data will be summarized and presented using a visual side-by-side comparison—a joint display—of the qualitative and quantitative results to examine commonalities and differences, and make conclusions about how the qualitative data explains and gives context to the quantitative findings.

  > **Research Question #4:** How—and to what extent—do the quantitative and qualitative study findings converge and diverge when examining potential associations between ACEs, PPD, PPA, self-rated postpartum physical health, and breastfeeding challenges?

Appendix B. Phase I Survey Tools

Edinburgh Postnatal Depression Scale[1] (EPDS)

As you are pregnant or have recently had a baby, we would like to know how you are feeling. Please check the answer that comes closest to how you have felt **IN THE PAST 7 DAYS**, not just how you feel today. In the past 7 days,

1. I have been able to laugh and see the funny side of things as much as I always could.
   - □ 0 – As much as I always could
   - □ 1 – Not quite so much now.
   - □ 2 – Definitely not so much now
   - □ 3 – Not at all

2. I have looked forward with enjoyment to things.
   - □ 0 – As much as I ever did
   - □ 1 – Rather less than I used to
   - □ 2 – Definitely less than I used to
   - □ 3 – Hardly at all

3. I have blamed myself unnecessarily when things went wrong.
   - □ 3 – Yes, most of the time.
   - □ 2 – Yes, some of the time
   - □ 1 – Not very often
   - □ 0 – No, never

4. I have been anxious or worried for no good reasons.
   - □ 0 – No, not at all.
   - □ 1 – Hardly, ever
   - □ 2 – Yes, sometimes
   - □ 3 – Yes, very often

5. I have felt scared or panicky for no very good reason.
   - □ 3 – Yes, quite a lot
   - □ 2 – Yes, sometimes

- □ 1 – No, not much
- □ 0 – No, not at all

6. Things have been getting on top of me.
   - □ 3 – Yes, most of the time I haven't been able to cope at all
   - □ 2 – Yes, sometimes I haven't been coping as well as usual
   - □ 1 – No, most of the time I have coped quite will
   - □ 0 – No, I have been coping as well as ever

7. I have been so unhappy that I have had difficulty sleeping
   - □ 3 – Yes, most of the time
   - □ 2 – Yes, sometimes
   - □ 1 – Not very often
   - □ 0 – No, not at all

8. I have felt sad or miserable
   - □ 3 – Yes, most of the time
   - □ 2 – Yes, quite often
   - □ 1 – Not very often
   - □ 0 – No, not at all

9. I have been so unhappy that I have been crying
   - □ 3 – Yes, most of the time
   - □ 2 – Yes, quite often
   - □ 1 – Only occasionally
   - □ 0 – No, not at all

10. The thought of harming myself has occurred to me.
    - □ 3 – Yes, quite often
    - □ 2 – Sometimes
    - □ 1 – Hardly ever
    - □ 0 – Never

[1]Cox, J.L., Holden, J.M., and Sagovsky, R. (1987). Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry 150*:782-786.

Anxiety Measure

Perinatal Anxiety Screening Scale (PASS)[2]

Over the past month, how often have you experienced the following? Please choose the response that most closely describes your experience for each question. Response options include: (0) Not at All; (1) Sometimes; (2) Often, and (4) Almost Always.

1.	Worry about the baby.
2.	Fear that harm will come to the baby.
3.	A sense of dread that something bad is going to happen.
4.	Worry about many things.
5.	Worry about the future.
6.	Feeling overwhelmed.
7.	Really strong fears about things (e.g. needles, blood, pain, etc.)
8.	Sudden rushes of extreme fear or discomfort.
9.	Repetitive thoughts that are difficult to stop or control.
10.	Difficulty sleeping even when I have the chance to sleep.
11.	Having to do things in a certain way or order.
12.	Wanting things to be perfect.
13.	Needing to be in control of things.
14.	Difficulty stopping checking or doing things over and over.
15.	Feeling jumpy or easily startled.
16.	Concerns about repeated thoughts.
17.	Being 'on guard' or needing to watch out for things.
18.	Upset about repeated memories, dreams, or nightmares.
19.	Worry that I will embarrass myself in front of others.
20.	Fear that others will judge me negatively.
21.	Feeling really uneasy in crowds.
22.	Avoiding social activities because I might be nervous.
23.	Avoiding things which concern me.
24.	Feeling detached like you're watching yourself in a movie.
25.	Losing track of time and can't remember what happened.
26.	Difficulty adjusting to recent changes.
27.	Anxiety getting in the way of being able to do things.
28.	Racing thoughts making it hard to concentrate.
29.	Fear of losing control.
30.	Feeling panicky.
31.	Feeling agitated.

[2]Somerville, S., Dedman, K., Hagan, R., Oxnam, E., Wettinger, M., Byrne, S., Coo, S., Doherty, D., Page, A.C. (2014). The Perinatal Anxiety Screening Scale: development and preliminary validation. *Archives of Women's Mental Health*, *7*(5), 443-454.DOI: 10.1007/s00737-014-0425-8

Adverse Childhood Experience (ACE) Questionnaire[3]

This 16 question survey asks about events that happened during your childhood. This information will allow us to better understand how experiences during childhood may affect people later in life, and how we can better support people to prevent difficult events and recover from them. These questions are personal and may cause some people to feel upset.

At the end of the survey, I will provide you will information for organizations that can provide you with information, support, and counseling related to these topics.

You can skip any question you do not want to answer. All questions refer to the time period ***before*** you were 18 years old.

While you were growing up, during your first 18 years of life:

1. Did a parent or other adult in the household **often** …
   Swear at you, insult you, put you down, or humiliate you? OR Act in a way that made you afraid that you might be physically hurt?

   YES NO

2. Did a parent or other adult in the household **often** …
   Push, grab, slap, or throw something at you? OR **Ever** hit you so hard that you had marks or were injured?

   YES NO

3. Did an adult person at least 5 years older than you **ever**…
   Touch or fondle you or have you touch their body in a sexual way? OR Attempt or actually have oral, anal, or vaginal intercourse with you?

   YES NO

4. Did you **often** feel that …
   No one in your family loved you or thought you were important or special? OR Your family didn't look out for each other, feel close to each other, or support each other?

   YES NO

5. Did you **often** feel that … You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? OR Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?

YES NO

6. Were your parents **ever** separated or divorced?

YES NO

7. Was your caregiver(s)/guardian(s):
Often pushed, grabbed, slapped, or had something thrown at them? OR **Sometimes**, **often, or very often** kicked, bitten, hit with a fist, or hit with something hard? OR **Ever** repeatedly hit at least a few minutes or threatened with a gun or knife?

YES NO

8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?

YES NO

9. Did you live with anyone who was depressed, mentally ill, or suicidal?

YES NO

10. Did a household member go to prison?

YES NO

11. Did your mother, father or guardian die?

YES NO

12. Did you "somewhat often" or "very often" experience times where your family found it difficult to cover the cost of food, housing, or other necessities?

YES NO

13. Were you ever the victim of violence OR witness any violence in your neighborhood?

YES NO

14. Were you ever treated or judged unfairly because of your race, skin color, culture, ethnic group, nationality, religion, gender, ability, or sexual orientation?

YES NO

15. Were you forced to go and live in another place due to war, terrorism, political or ethnic conflicts, genocide, repression, disappearances, torture, OR organized violent crime such as banditry and gang warfare?

YES NO

16. Were you ever beaten up by soldiers, police, militia, or gangs OR witnessed a family member or friend killed or beaten up by soldiers, police, militia, or gangs?

YES NO

[3]Tool informed by: Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, *14*(4), 245-258; Child and Adolescent Health Measurement Initiative (CAHMI), Data Resource Center on Child and Adolescent Health website. (2018). *Guide to topics & questions asked. National Survey of Children's Health 2016; and* World Health Organization (WHO). (2018). *Adverse Childhood Experiences International Questionnaire (ACE-IQ).*

Everyday Discrimination Scale (Short Version)[4]

In your day-to-day life how often have any of the following things happened to you?

		Almost everyday	At least once a week	A few times a month	A few times a year	Less than once a year	Never
1.	You are treated with less courtesy or respect than other people.						
2.	You receive poorer service than other people at restaurants or stores.						
3.	People act as if they think you are not smart.						
4.	People act as if they are afraid of you.						
5.	You are threatened or harassed.						

Follow-up Question (Asked only of those answering "A few times a year" or more frequently to at least one question.):

What do you think is the main reason for these experiences?
1. Your Ancestry or National Origins
2. Your Gender
3. Your Race
4. Your Religion
5. Your Sexual Orientation
6. Other (write-in)

[4]Sternthal, M., Slopen, N., Williams, D.R. "Racial Disparities in Health: How Much Does Stress *Really* Matter?" Du Bois Review, 2011; 8(1): 95-113.

Demographic Questions

1. Do you currently live in the United States? Yes No (closes survey)
2. What state do you live in? (pull down menu)
3. What is your 5-digit zipcode?
4. What is your age (years): _____ (< 18 years closes survey)
5. Are you currently pregnant? Yes (closes survey) No
6. Did you give birth to a live baby less than one year ago? Yes No (closes survey)
7. Please select your relationship status:
    - Single
    - Married
    - Separated
    - Divorced
    - Widowed
8. Race and Ethnicity (choose all that apply):
    - White
    - Hispanic or Latino
    - Black or African American
    - Native American or American Indian
    - Asian / Pacific Islander
    - Other (please tell us): _____
9. Were you born in the United States?
    Yes No
    a. If no, what country were you born in?
    b. If no, how many years ago did you move to the United States?
10. What is your current employment status (choose all that apply)?
    - Employed full-time
    - Employed part-time
    - Out of work and looking for work
    - Out of work but not currently looking for work
    - A homemaker

- A student
- Military
- Unable to work
- Other (write-in)

11. In general, would you say your health is_____?
    a. Excellent
    b. Very good
    c. Good
    d. Fair
    e. Poor

12. For your most recent birth, what kind of insurance did you have?
    a. Private health insurance
    b. Medicaid/HMO
    c. No insurance/Private pay

13. For your most recent birth, did you receive any paid time off from work?

    Yes No Does not apply (not working at the time)

    If yes, how much paid time off did you receive?
    a. Less than 2 weeks
    b. 2 – 4 weeks
    c. 4 – 6 weeks
    d. 6 – 8 weeks
    e. 8 – 12 weeks
    f. 3 – 6 months
    g. More than 6 months

14. For your most recent birth, did you use unpaid leave through the Family and Medical Leave Act (FMLA)?

    Yes No

    If yes, how much unpaid time off did you use?
    h. Less than 2 weeks
    i. 2 – 4 weeks
    j. 4 – 6 weeks
    k. 6 – 8 weeks
    l. 8 – 12 weeks
    m. 3 – 6 months

n. More than 6 months

15. Were you eligible to take time off from work through the Family and Medical Leave Act (FMLA)?
    Yes No Unsure

16. *Prior to/Before* your most recent experience giving birth, were you ever diagnosed with or treated for:
    a. A chronic physical health problem (e.g. asthma, arthritis, autoimmune disease, cancer, diabetes, heart disease, hyper/hypothyroidism, etc.)
       Yes No

    b. Depression
       Yes No

    c. Anxiety
       Yes No

17. *Since/After* your most recent experience giving birth, have you been diagnosed with or treated for:

    a. A chronic physical health problem (e.g. asthma, arthritis, autoimmune disease, cancer, diabetes, heart disease, hyper/hypothyroidism, etc.)
       Yes No

       If yes, are you taking medication for your health condition?
       Yes No

       If yes, are you attending mental health counseling for coping with your health condition?
       Yes No

       If yes, other than counseling or medication, how do you manage your chronic health condition? (write-in) _____

       If yes, do you seek support for your health condition from ____?
       Family, Friends, Others: In-Person
       Family, Friends, Others: Online
       Both
       Neither

b. Depression

Yes No

If yes, are you taking medication for depression?
Yes No

If yes, are you attending mental health counseling for depression?
Yes No

If yes, other than counseling or medication, how do you manage your depression? (write-in) _____

If yes, do you seek support for depression from ____?

Family, Friends, Others: In-Person
Family, Friends, Others: Online
Both
Neither

c. Anxiety

Yes No

If yes, are you taking medication for anxiety?
Yes No

If yes, are you attending mental health counseling for anxiety?
Yes No

If yes, other than counseling or medication, how do you manage your anxiety? (write-in)

If yes, do you seek support for your anxiety from _____?

Family, Friends, Others: In-Person
Family, Friends, Others: Online
Both
Neither

18. Did any health or mental health professional talk to you about postpartum anxiety or depression after you most recently gave birth?
Yes No

19. What is your year of birth? _____

20. Have you ever experienced _____? (Choose all that apply)
    a. Infertility
    b. Miscarriage
    c. Infant Loss
    d. None of the above

21. How did you hear about this survey? (Choose all that apply)
    a. Email invitation
    b. Social media advertisement
    c. Social media group
    d. From a friend
    e. Other _____

Socioeconomic questions

1. What level of education did you complete?

    1. Less than high school
    2. High school graduate or equivalent (GED)
    3. Some college or technical school
    4. College graduate or more

2. What is your average monthly household income after taxes? Please include all income (earnings, welfare, child support, unemployment, etc.).
    1. Less than $1,000
    2. $1,001 - $2,000
    3. $2,001 - $3,000
    4. $3,001 - $4,000
    5. $4,001 - $5,000
    6. $5,001 - $6,000
    7. $6,001 - $7,000
    8. $7,001 - $8,000
    9. $8,001 - $9,000
    10. $9,001 - $10,000
    11. More than $10,000

3. How many people are in your household (including yourself) that share this income?

    _____

4. Do you _____?
    - Own a home? Yes No
    - Have a personal vehicle? Yes No
    - Have a savings account? Yes No
    - Have a retirement savings account? Yes No

Childbirth and Infant Feeding Questions

1. How many children do you have?

2. How old were you the first time you gave birth? _____ years old

3. How many times have you given birth? _____

4. (*If you have given birth more than once*), how many months apart were your two most recent births? _____ months _____years

5. Was your most recent birth:
    a. A singleton/one baby
    b. multiple birth/twins, triplets, etc.

6. Date of birth of youngest child (*or children,* if multiple birth):
_____(mm/dd/yyyy)

7. Did you deliver your youngest child (*or children,* if multiple birth):
In a hospital In a birthing center At home Other…_____

8. Was your latest birth:
Vaginal delivery C-section

9. Did your youngest child (or any of your children, if multiple birth) spend any time in the neonatal intensive care unit (NICU)?
Yes No

10. Was your youngest child (children, if multiple birth) born pre-term (born before 37 weeks of pregnancy are completed)?
Yes No I'm not sure

11. Are you currently parenting your youngest child (or children, if multiple birth)?
Yes No (placed for adoption) No (other_____write-in)

12. Was your most recent birth the result of a planned or unplanned pregnancy?
Planned Unplanned Other _____

13. *Prior to* your most recent childbirth, did you plan to breastfeed?

Yes No I'm not sure

a. If yes, did you/have you reached your own personal breastfeeding goals so far?

Yes No Not applicable - no intention or unable to breastfeed

14. After childbirth, did you try breastfeeding (for any length of time)?

Yes No

a. If yes,
   i. Up to one week
   ii. 1 – 4 weeks
   iii. 1 – 3 months
   iv. 3 – 6 months
   v. 6 – 9 months
   vi. 9 – 12 months or still breastfeeding

15. How are you currently feeding your youngest child (or children, if multiple birth)?
   a. Breastfeeding/breastmilk
   b. Formula feeding
   c. A combination of breastfeeding/breastmilk and formula feeding
   d. Other (write-in)_____

16. Did you experience any breastfeeding challenges?

Yes No Does not apply (no intention or unable to breastfeed)

If yes, please choose statements that fit with your experiences: (choose all that apply)

- I had nipple pain/discomfort.
- I had mastitis.
- I had clogged ducts.
- I was not producing enough milk for my baby (undersupply).
- I was producing too much milk for my baby (oversupply).
- I was advised to stop breastfeeding or also give formula.
- My baby had trouble sucking or latching.
- My baby had tongue tie.
- We had thrush.

- I did not have support I needed to breastfeed from family, friends, and/or medical professionals.
- I had breastfeeding challenges related to my employment.
- Me and/or my baby had medical conditions or were taking medications that did not allow for breastfeeding.
- Other (write-in): _____

17. Did/do you seek support for breastfeeding challenges from _____?

    Family, Friends, Others: In-Person
    Family, Friends, Others: Online
    Both
    Neither

18. Have you ever heard of breastmilk sharing (breastfeeding another's baby or pumping and donating breastmilk to someone else)?

    Yes No Unsure

    a. If yes, have you ever used donated milk to feed your child?
    b. If yes, have you ever allowed someone else to breastfeed your child?
    c. If yes, have you ever donated milk to someone else's child?
    d. If yes, have you ever breastfed someone else's child?
    e. If no, would you ever consider using someone else's breastmilk to feed your child if you were having breastfeeding challenges?
    f. If no, would you ever consider donating breastmilk to someone else who was having breastfeeding challenges?

    Please leave any general comments regarding breastmilk sharing:

Material hardship questions[4]

In the past 12 months…

1. Did you receive food or meals through a food bank, soup kitchen, or SNAP/the food stamps program?

   Yes No Don't know

2. Were you ever hungry, but didn't eat because you couldn't afford enough food?
   Yes No Don't know

3. Did you not pay the full amount of rent or mortgage payments?
   Yes No Don't know

4. Did you not pay the full amount of a gas, oil, electricity, or cell phone bill?

   Yes No Don't know

5. Were you evicted from your home or apartment for not paying the rent or mortgage?
   Yes No Don't know

6. Was your gas, electric service, or cell phone ever turned off, or the heating oil company did not deliver oil, because there wasn't enough money to pay the bills?
   Yes No Don't know

7. Did you borrow money from friends or family to help pay bills?
   Yes No Don't know

8. Did you move in with other people even for a little while because of financial problems?
   Yes No Don't know

9. Did you stay at a shelter, in an abandoned building, an automobile, or any other place not meant for regular housing, even for one night?
   Yes No Don't know

10. Was there anyone in your household who needed to see a doctor, go to the hospital, or buy medication but couldn't because of the cost?
    Yes No Don't know

[4]Revised from Mayer, S. E., & Jencks, C. (1989). Poverty and the distribution of material hardship. *Journal of Human Resources*, 88-114.

Multidimensional Scale of Perceived Social Support[5]

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

Circle "1" if you **Very Strongly Disagree**
Circle "2" if you **Strongly Disagree**
Circle "3" if you **Mildly Disagree**
Circle "4" if you are **Neutral**
Circle "5" if you **Mildly Agree**
Circle "6" if you **Strongly Agree**
Circle "7" if you **Very Strongly Agree**

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

[5]Zimet, G.D., Dahlem, N.W., Zimet, S.G. & Farley, G.K. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment, 52*, 30-41.

Invitation to Participate in Telephone/Online Interviews

Based on survey responses, a limited number of individuals will be invited to participate in a telephone or video conference interview to collect some more detailed information. If you are interested in being invited to participate in a telephone interview, please leave your contact information below. This information will be kept separate from your online survey responses to best protect your confidentiality.

Are you interested in possibly participating in a later interview?

Yes No Maybe

Name:

Home State: (pull down menu)

Time zone (pull down menu)

Email address:

Preferred Phone Number:

Check: Mobile Home Other_____

Preference for interview: Telephone Video Conferencing (free online software)

In case we are unable to reach you at this number, please provide an alternate number:

Gift Card Raffle Entry:

If you would like to be entered into a raffle to win a gift card, please enter your name and email below.

Name:

Email:

Appendix C. Phase II Semi-structured Interview Guide

Choose Alias

We are going to start talking about your life experiences and your thoughts about them, starting with your childhood and gradually moving toward the present.

Childhood and Adolescence

1. How would you describe your childhood?
    a. What are your most important memories, experiences, and life events from that time?
    b. Can you talk a bit about your relationships with your parents/caregivers who raised you?
    c. Did you experience any important changes/transitions or turning points that significantly affected you or the direction of your life? Please describe.

Adulthood

2. What would you say have been your biggest successes in adulthood? What about your biggest challenges?

3. Have you experienced any important changes/transitions or turning points as an adult? Please explain.

4. How, if at all, have your childhood experiences affected you as you've become an adult? Probe:
    a. How, if at all, has becoming a parent caused you to reflect upon your experience as a child?
    b. In what ways would you like your child's childhood and/or adulthood to be similar/different from yours?

Pregnancy, Childbirth, and Motherhood

5. Please describe your pregnancy and childbirth experience. What about your recovery after birth? Probe:
    a. What has helped you recover from childbirth and adjust to motherhood?
    b. What has been unhelpful?

6. (*Reference physical health rating from Phase I)* - How would you describe your physical health since having giving birth?
    a. What has been most helpful in supporting your physical health?
    b. What has been unhelpful in supporting your physical health?

7. In what ways has your life been most impacted by having a child? What have been your most positive postpartum experiences? What about negative postpartum experiences? Probes:
    a. Did this affect your work, income and/or your ability to provide for your family?
    b. Relationships with others?
    c. Overall health and wellness?

8. (*Reference breastfeeding experiences and challenges responses from Phase I).* Please describe your breastfeeding intentions/plans and your experiences. Probes:
    a. (*if applicable*): What has been most helpful in your breastfeeding journey and efforts?
    b. (*if applicable*): What has been most unhelpful in your breastfeeding journey and efforts?
    c. (*if applicable*): Looking back, is there anything that you wish you knew or that you think might have helped prevent or minimize breastfeeding challenges?
    d. Do you think there is any relationship between your breastfeeding experiences and anything we've talked about related to your previous life experiences up to this point? Please describe.

9. (*Reference depression and anxiety scores from Phase I)*
    a. *For mothers who had a positive screen for depression/anxiety*:
        i. Since having your baby, please describe any symptoms of depression or anxiety you've experienced (e.g. sadness, inability to sleep, nervousness, anger, mood swings, panic attacks, restlessness, fear, guilt, or panic attacks)? Probes:
        ii. What was this like? What symptoms have you experienced most?
        iii. How long did it last or is it still going on?
        iv. Were you ever diagnosed by a professional with postpartum depression or anxiety?
        v. Did you seek help? If so, please describe any treatment you received or tried.
        vi. Do you think there is any relationship between your postpartum experience and anything we've talked about related to your previous life experiences up to this point? Please describe.

vii. What has been most helpful/unhelpful to your recovery?

b. *For mothers who did not have positive screen for depression/anxiety:*
    i. What, if anything, do you attribute to your positive adjustment postpartum/not experiencing postpartum depression or anxiety? What has been most helpful/unhelpful?
    ii. Do you think there is any relationship between your postpartum experience and anything we've talked about related to your previous life experiences up to this point? Please describe.

Closure/Wrap-Up Questions

10. Is there anything important we've left out of your life story and postpartum experience? Probe:
    a. Do you think you have been able to give a fair picture of yourself/your life to this point?
    b. Is there anything else you think would be helpful for me to know?
    c. What are your thoughts/feelings about this interview and all we have covered?

<u>Participant Characteristics/Demographics (will be taken from Phase I data collection):</u>

1. Race/ethnicity
2. Age
3. Level of education completed
4. Relationship status
5. Employment status
6. Estimated monthly income
7. Number of children
8. State of residence
9. Email address (for incentive distribution only)