

Article

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

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Abstract

Perinatal mental health (PMH) conditions are the most common complications of pregnancy and the first postpartum year. Adverse childhood experiences (ACEs) are increasingly recognized as important contributors to PMH, particularly postpartum depression and anxiety (PPD/A). This study examines a broad range of ACEs—including parental mental illness and substance use, incarceration, death, divorce, discrimination, economic hardship, and forced migration—to assess their influence on PPD/A. Using a modified explanatory sequential mixed-methods design, phase I included an online survey of racially, ethnically, and socioeconomically diverse U.S. women ($n = 306$) who delivered a live infant in the past year. Hierarchical regression showed that while ACEs initially predicted PPD/A, this association was no longer significant when social support, material hardship, and discrimination were added to the model. These current life circumstances emerged as stronger direct predictors of PPD/A than ACEs. In phase II, purposive and stratified sampling identified participants with ACE scores ≥ 4 for interviews ($n = 22$). Qualitative findings identified social support, financial security, work flexibility and choice, and time for self-care as central protective factors in adjustment to motherhood when these resources aligned with mothers' individual needs and values. Results can inform clinical counseling, ACEs screening, and policies to strengthen PMH support.

Keywords: perinatal mental health; adverse childhood experiences; discrimination; material hardship



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1. Introduction

Perinatal mental health (PMH) conditions are the most common complications of pregnancy and the first year postpartum (Fawcett et al. 2019; Gavin et al. 2005). PMH encompasses not only depression and anxiety, but also a broad range of mental health challenges that can arise throughout the perinatal period (Howard and Khalifeh 2020), with the World Health Organization (WHO) recognizing PMH as a significant public health concern (World Health Organization 2025). A cross-sectional analysis of the 2018–2022 national restricted-use mortality file identified suicide, homicide, and overdose as the leading causes of pregnancy-related death (Wallace and Jahn 2025). Moreover, untreated

PMH costs an estimated 14.2 billion dollars per year in the United States (U.S.) (Luca et al. 2019). Women may be at increased risk for developing a PMH condition due to psychiatric history, socioeconomic disadvantage, limited social support, trauma exposure in birth or sexual abuse, military service, neonatal intensive care unit (NICU) admission, disability, and immigration status (Agrawal et al. 2022; Alhusen et al. 2023; Chaudron et al. 2010; Falah-Hassani et al. 2015; Gregory et al. 2025; Johansen et al. 2020; Miller et al. 2022; Wosu et al. 2015). Additionally, a meta-analysis of 33 studies revealed that gestational diabetes, having boy infants, and epidural anesthesia use were also identified as risk factors for perinatal depression (Liu et al. 2022). In addition to experiencing symptoms such as persistent sadness, lack of interest, sleep disturbances and low self-esteem, mothers with postpartum anxiety (PPA) and/or postpartum depression (PPD) may be at increased risk for a preterm birth, a baby with low birth weight, and negative developmental outcomes for the child (Grote et al. 2010; Koutra et al. 2017; Liu et al. 2022). Additionally, untreated PPD may impact the health of other children in the home and the partner relationship (Valdes et al. 2023).

Adverse childhood experiences (ACEs) were first linked to health outcomes in adulthood through a landmark study by Kaiser-Permanente and the CDC, led by Felitti and colleagues (1998). They defined ACEs as early life stressors occurring before age 18, including physical, sexual, and psychological abuse, neglect, and family dysfunction (Felitti et al. 1998). Adults were given a questionnaire to tally the number of adverse experiences they encountered by 18 years of age. While ACEs scores of four or higher identify the potential for negative health outcomes, it is important to note that not all events impact individuals equally (Alhowaymel et al. 2023). Higher ACEs have since been linked to multiple chronic health conditions, including psychological disorders, substance abuse, obesity, cardiovascular disease and cancer (Felitti et al. 1998; Kalmakis and Chandler 2015). Additionally, research examining ACEs and their associations with other outcomes in non-Western contexts remains limited (Basto-Pereira et al. 2022; Ceccarelli et al. 2022). Given their significant impact on long-term health, ACEs have become a key focus of research on maternal health and well-being (Choi et al. 2018; Choi and Sikkema 2016).

A study done by Prentice et al. showed that women with PPD are more likely to have high-risk ACE scores than the general population (Prentice et al. 2022). A 2025 study indicated that maltreatment ACEs carry the greatest risk for PMH concerns, more specifically emotional neglect as a high predictor of PPD, physical abuse as a predictor of perinatal bipolar disorder, and sexual abuse as a predictor of PPA (Souch et al. 2025). ACEs may play a role in PPD/A development through several hypothesized mechanisms: structural brain changes in stress-responsive regions that alter emotional regulation and stress reactivity across the life course, disrupted relationship functioning and attachment patterns that challenge cognitive and emotional responses and complicate the transition to motherhood, and economic trajectories whereby childhood adversity increases the likelihood of material hardship that persists into adulthood and the perinatal period (Metzler et al. 2017; Sperlich et al. 2017; Shonkoff et al. 2012).

Encouragingly, while ACEs increase the risk of maternal mental health concerns, trauma-informed care and strengthened support during and after pregnancy may reduce these effects (Mackle et al. 2023; Racine et al. 2021). Research shows that higher levels of perceived postpartum support are associated with reduced negative mental health outcomes and an increase in mother–infant bonding (Cho et al. 2022; Mann et al. 2010; Schwab-Reese et al. 2016; White et al. 2023; Zhang and Jin 2016). However, it should be noted that the experience of receiving social support is individual, shaped by personal preferences and cultural norms, and may come through a variety of avenues (Leahy-Warren et al. 2011). Cultures vary in the presentation of family support (Volling et al. 2019). In

some cultures, families provide both physical and psychological support to mothers and their families (Xiao et al. 2019). Other cultures that are more individualistic emphasize self-reliance and limited family support (Hofstede 1980). Collectively, these findings emphasize the need for proactive interventions to ensure perinatal women and parents, especially those with increased risk factors, receive tailored and culturally sensitive support from both informal and formal networks.

Material hardship, or the inability to afford basic needs like food, housing, and medical care, is less studied in the perinatal period (Health Resources and Services Administration 2023). A 2018 study found that over half of pregnant women reported some form of material hardship, which was strongly linked to elevated depression and anxiety (Katz et al. 2018). Unmet basic needs and financial stressors may be a critical driver of PMH and risks to maternal and child well-being (Cantrell et al. 2025).

Finally, a large body of research demonstrates that perceived discrimination has a profound negative impact on health problems during pregnancy and beyond (Bécares and Atatoa-Carr 2016; Masters et al. 2024; Williams et al. 2019). Discrimination is not only a risk factor for adverse outcomes; such as preterm birth, low birthweight, small gestational age, and hypertensive disorders of pregnancy (van Daalen et al. 2022), but it is also consistently linked to perinatal depression (Masters et al. 2024; Segre et al. 2021). Experiences of racial discrimination are deeply embedded in the historical and cultural contexts of racialized communities. These historical and cultural legacies shape contemporary exposures to discrimination, influencing social determinants of health (Clement and Fay 2021). Racism also directly impacts health services and resources, including access to care (Clement and Fay 2021). The cumulative effects of systemic discrimination, bias, and associated trauma contribute to chronic psychosocial stress and distrust of medical systems, ultimately leading to poorer health outcomes and shorter life expectancies (Forde et al. 2019; Hudson et al. 2016). In a 2023 latent class analysis, both Black and White participants who reported general discrimination were at greater risk for postpartum depressive symptoms (PPDS) compared to those who did not report discrimination (Doherty et al. 2023). Studies further suggest that the effects of discrimination may intersect with socioeconomic disadvantage, as Ertel et al. (2012) found that while a more affluent cohort of Black women reported higher rates of racism, elevated depressive symptoms were only observed in the financially disadvantaged cohort. Additionally, research suggests that racial/ethnic discrimination is also predictive of prenatal depressive symptoms among Hispanic mothers (Walker et al. 2012). Lastly, participants who reported being upset by racial discrimination had almost three times greater odds of experiencing PPDS (Weeks et al. 2022). Findings suggest discrimination is a critical social determinant of PMH, while social support and resilience may play protective roles, buffering against some of these adverse effects (Masters et al. 2024).

This study employs a combined theoretical framework of life course theory and liberation health social work to examine PPD/A. Life course theory posits that early ACEs can affect later health through latent effects (critical period exposures), pathway effects (reinforcing negative trajectories), and cumulative effects (compounding risks over time) (Elder et al. 2003; McCloskey and Pei 2022). The liberation health social work model explicitly centers the sociopolitical environment by situating PPD and PPA within interconnected personal (e.g., ACE history), cultural (e.g., racism, sexism, classism, mental health stigma), and institutional (e.g., for-profit healthcare, lack of paid parental leave) factors (Martinez and Fleck-Henderson 2014; McCloskey and Karandikar 2018).

Social support, experiences of discrimination, and material hardship were chosen as moderators for examination because they are associated with PMH outcomes in the literature. Although research specific to discrimination, material hardship, and PPD/A is in its infancy, they represent noteworthy and potentially modifiable factors that can significantly

alter the life course and be targeted for prevention and intervention. This framework is essential for interpreting these variables, as cross-cultural research demonstrates that parenting beliefs and practices are culturally embedded, influencing how adversity, including ACEs, is experienced, interpreted, and managed (Kotchabhakdi et al. 1987; Thai 2024). Culture shapes both the likelihood of ACE exposure—through systemic inequities that disproportionately subject marginalized communities to childhood adversity—and the pathways linking ACEs and current social conditions to PPD/A, including differences in coping mechanisms, help-seeking behaviors, symptom expression, and access to protective resources. Rather than viewing discrimination, social support, and material hardship solely as individual-level phenomena, this framework recognizes them as shaped by broader systems of oppression. Examining these moderators will help elucidate whether their presence or absence results in differing PPD/A outcomes for mothers with and without ACEs.

This study examines how ACEs, social support, material hardship, and experiences of discrimination influence PMH. 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?

2. Materials and 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 were collected in phase I, followed by qualitative data collection in phase II (see Figure 1; Creswell and Plano Clark 2018). A minimum of 108 participants was required to achieve power of 0.90 ($\alpha = 0.05$) and to detect a small effect size (Cohen's $f^2 = 0.15$). Sample size was determined using G Power (version 3.1, Kiel, Germany) a free statistical power analysis program (Faul et al. 2009).

Study procedures were approved by a university Institutional Review Board. Non-probability convenience sampling was used to recruit phase I quantitative participants using four modalities: (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 perinatal women from diverse racial, ethnic, and socioeconomic backgrounds; and (d) emailing the lead researcher's contacts who served women in the perinatal period. Women were eligible for the study if they (1) were ≥ 18 years of age, (2) resided in the US, (3) were not currently pregnant, and (4) gave birth to a live newborn within the previous 12 months.

In phase I, 306 participants completed an online survey, and using these data, purposive and stratified sampling was used in phase II to invite a strategically selected and diverse subset of participants ($n = 22$) with ACEs scores of four or greater to individual interviews. This included eleven 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 eleven 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. Incentives included a USD 10 electronic gift card for those who completed the online survey, and a USD 30 gift card for the interview. Interviews, which were approximately 60 min in length, were conducted via telephone from June to July 2019. One of the authors conducted all interviews, which were recorded and later transcribed

verbatim by an IRB-approved professional transcription service. To ensure qualitative rigor and trustworthiness, we employed memo writing, reflexivity practices, peer debriefing, negative case analysis, and maintained detailed audit trails (Morse 2015). Researchers kept independent records of coding decisions and analytical reflections. Recognizing that researcher positionality—including the first author’s identity as a White doctoral student—could influence participant comfort and data interpretation, we engaged in ongoing reflexive practices, including regular supervision with a qualitative expert, use of semi-structured interviews allowing participants to guide content, and vigilant attention to potential biases throughout analysis (Dodgson 2019).

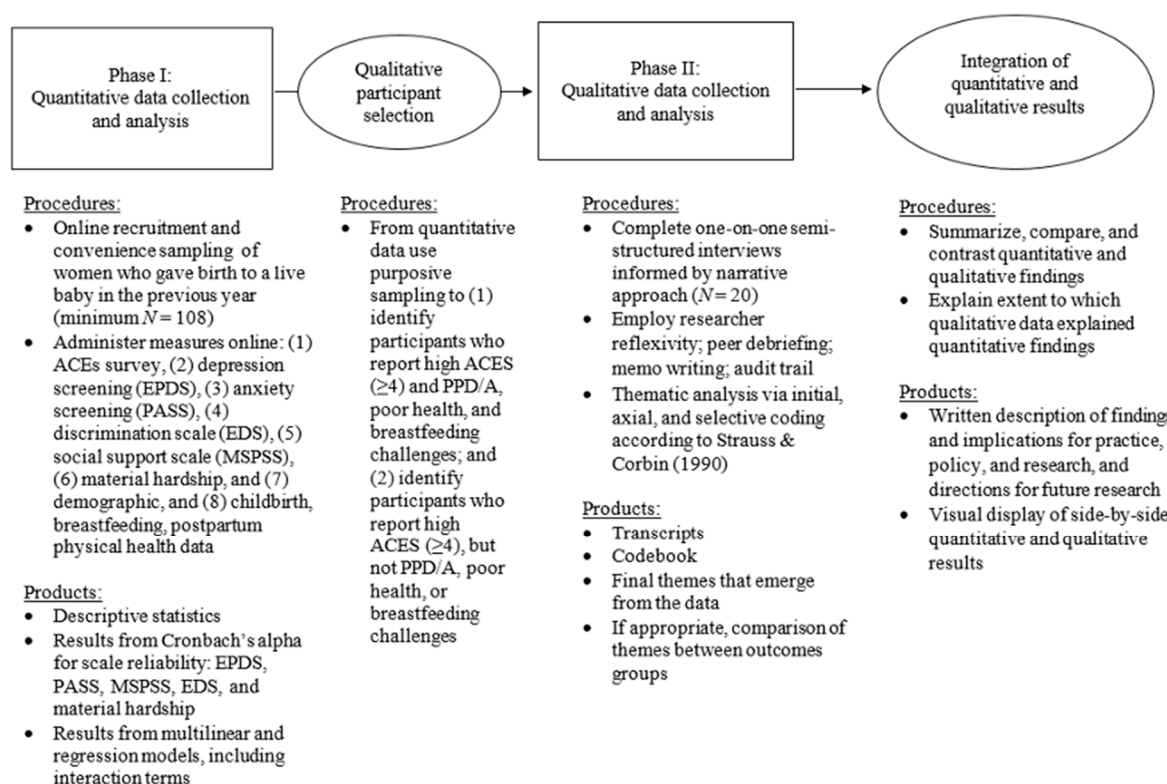


Figure 1. Modified mixed methods explanatory sequential design study diagram (Strauss and Corbin 1990).

Dependent Variable: PPD was measured using a one-time questionnaire, Edinburgh Postnatal Depression Scale (EPDS), with 4-point Likert-type, 10-items (Cox et al. 1987). PPA was measured using a one-time questionnaire, the Perinatal Anxiety Screening Scale (PASS), with thirty-one 4-point Likert-type items (Somerville et al. 2014). The EPDS and PASS were selected due to their strong psychometric properties, perinatal specificity, and widespread use in both research and clinical settings. The EPDS and PASS are screening tools that assess risk for PPD/PPA rather than providing an assessment or clinical diagnosis. Accordingly, study findings refer to elevated depressive or anxiety symptom risk and were not based on psychiatric diagnosis. The Cronbach’s alphas for the EPDS and PASS were 0.89 and 0.96, respectively.

Independent Variable: The ACEs survey included the 10 core questions from the original CDC-Kaiser Permanente ACE Study (Felitti et al. 1998), plus 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 (CAHMI 2018; World Health Organization 2020). This expanded measure was selected to provide a more comprehensive and culturally relevant

assessment of childhood adversity. The standard ACEs measure has been critiqued for inadequately capturing adversities disproportionately experienced by racially, ethnically, and socioeconomically marginalized communities (Cronholm et al. 2015). By including community and context-level adversities, this broader conceptualization recognizes that ACEs are patterned by structural inequities and provides increased understanding of how community and environmental factors influence outcomes. The retention of the ACE score of 4+ as a clinical cut-off was maintained based on established research demonstrating dose–response relationships between ACE exposure and health outcomes (Felitti et al. 1998). While we acknowledge that the meaning and impact of specific ACEs may vary across cultural contexts, the expanded measure better captures the range of adversities relevant to our diverse sample than the original 10-item scale alone.

Moderator variables: Material hardship, social support, and discrimination were conceptualized as binary moderators to help elucidate whether or not the presence or absence of these factors would result in differing outcomes for mothers with ACEs. This moderation framework allowed us to identify which subgroups or social contexts show different patterns of association. Dichotomization also facilitated interpretation of multiple interaction terms, allowing clearer communication of how risk and protective factors operate in combination.

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 include the following: “did you not pay the full amount of rent or mortgage payments,” “did you borrow money from friends or family to help pay bills,” and “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). Material hardship was then turned into a binary variable (no experiences of material hardship = 0; 1 or more experiences of material hardship = 1). The material hardship scale demonstrated acceptable internal consistency in this sample ($\alpha = 0.77$).

Social support. Social support was measured using the 12-question Multidimensional Scale of Perceived Social Support [MSPSS] (G. D. Zimet et al. 1988). Sample items include the following: “There is a special person with whom I can share my joys and sorrows;” “My family tries to help me;” and “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 mean score. For this study, the mean 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) (G. Zimet 2016). The Cronbach's alpha for the MSPSS was 0.95.

Discrimination. The Everyday Discrimination Scale (short version; EDS) provided 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 et al. 2011). 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, from never (0) to almost every day (5). A total EDS score was calculated by adding item 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). The EDS demonstrated good internal consistency ($\alpha = 0.82$).

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, type of birth, and history of child's admission to neonatal intensive care unit.

Data Analyses

Quantitative Data: Data analyses for the quantitative data were completed using the Statistical Pack for the Social Sciences (SPSS) Version 24 (IBM Corp., Chicago, IL, USA) software. Given the limited amount of missing data ($n = 3$ cases), listwise deletion was used. We conducted descriptive statistics and assessed the assumptions required for regression analysis, including normality, linearity, multicollinearity, and homoscedasticity, and also calculated Cronbach's alpha for each measure to evaluate scale reliability. All continuous variables were mean centered and interaction terms were created using ACEs with each potential moderator 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, material hardship, social support, and discrimination, and lastly, the interaction terms, to examine the incremental contribution of predictors.

Qualitative Data: For the qualitative data, 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. The high-adverse-outcomes group data were coded first to establish a comprehensive coding framework, followed by low-adverse-outcomes group data. Thematic analysis via the use of open, axial, and selective coding was used to analyze the data (Saldaña 2015). After initial review of the transcripts, open coding allowed for general 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, and subcategories were identified and refined. Lastly, in selective coding, the final coding themes were identified. Qualitative and quantitative data were compared, contrasted, and integrated to explore similarities and differences. Codes were refined to ensure they accurately captured participants' meanings across cultural contexts. 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 to make final conclusions about how well the qualitative data explained and gave context to the quantitative findings (Creswell and Plano Clark 2018).

3. Results

3.1. Descriptive Statistics

In phase I, mothers' average age was 31.06 years, and the majority (89.21%) reported being married or partnered. Those identifying as White (66.34%) were the majority, followed by Black/African American (16.34%). See Table 1 for full demographics.

Table 2 displays the independent, dependent, and moderator variable scale scores. The mean ACEs score was 3.26. Over 80% of the sample reported at least one ACE. A high ACEs score (≥ 4) was recorded for 41.83% ($n = 128$) of the sample. Over a quarter of the sample (26.80%) screened positive for PPD and 41.83% screened positive for PPA. The majority reported good–excellent physical health (92.81%), 72.22% of those who attempted breastfeeding reported difficulty doing so, 24.34% reported lower levels of social support, 35.29% reported experiencing discrimination, and 46.73% met the criteria for material hardship.

Table 1. Phase I participant demographics (N = 306).

Characteristic	<i>n</i> (%)	<i>M</i> (<i>SD</i>)	Range
Mother's Age		31.06 (4.94)	19–44
Poverty Ratio		0.75 (0.49)	0.02–2.31
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)		

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

Table 2. Phase I independent, dependent, and moderator variable scores (N = 306).

Scores	<i>n</i> (%)	<i>M</i> (<i>SD</i>)	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		0.95 (0.89)	0–5
High	108 (35.29)		
Low	198 (64.70)		
Material Hardship		0.13 (0.19)	0–0.90
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 (0.84)	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)		

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; and ² calculated among the *n* = 290 who attempted breastfeeding.

3.2. Multiple Linear Regression

See Table 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, $F(13, 290) = 6.63, p \leq 0.001$; 29.10% of the variance in outcomes for PPA, $F(13, 289) = 9.13, p \leq 0.001$; and demonstrated that ACEs were positively associated with PPD ($\beta = 1.29, p \leq 0.001$) and PPA ($\beta = 0.27, p \leq 0.05$). Each additional ACE increased EPDS scores by approximately 1.3 points and PASS scores by approximately 0.3 points. Mothers with 4+ ACEs could then score 1–2 points higher (on PASS) and 5+ points higher (on EPDS), elevating the probability of having a positive screen. 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. Attenuation of ACE effects after adjustment likely reflects mediation or over-adjustment, not diminished importance of ACEs. Social support, discrimination, and material hardship explained an additional 14% of PPA variance and 19% of PPD variance beyond ACEs alone. 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, $F(19, 284) = 11.19, p \leq 0.001$, and 43.5% of the variance in outcomes for PPA, $F(19, 283) = 11.48, p \leq 0.001$. No interactions were found. Discrimination ($\beta = 8.93, p \leq 0.001, 95\% \text{ CI } [3.13, 14.72]$; $\beta = 3.61; p \leq 0.001, 95\% \text{ CI } [1.75, 5.47]$), material hardship ($\beta = 9.47, p \leq 0.001, 95\% \text{ CI } [3.90, 15.04]$; $\beta = 2.54; p \leq 0.01, 95\% \text{ CI } [0.74, 4.34]$), and social support ($\beta = 5.83, p \leq 0.01; \beta = 2.72; p \leq 0.001, 95\% \text{ CI } [1.40, 4.03]$) were all statistically significant predictors for PPD and PPA. In other words, each instance of discrimination or material hardship was associated with an approximately 9-point increase in EPDS scores, while low social support was linked to a 6-point increase in EPDS scores. The cumulative effect of having all three risk factors (discrimination, material hardship, and low social support) was a potential increase of 9 points on the PASS. These results highlight the significant impact of these risk factors on PMH. A prior history of depression and anxiety was also a significant predictor of PPD/A. Additionally, mothers identifying as Black or African American ($\beta = -5.77, p = 0.02$) and Asian or Native American ($\beta = -10.05, p = 0.02$) were less likely to meet the criteria for PPA when compared to White mothers. Differences by race/ethnicity were presented as exploratory due to small cell sizes.

Table 3. Hierarchical linear regression analyses for postpartum anxiety ($N = 303$) and depression ($N = 304$).

	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 ***	0.77 ***	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

Table 3. *Cont.*

	Model 1		Model 2		Model 3			Model 4				
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			0.04	0.19	0.14		0.19		0.01		0.01	

Notes: Hx = history; NICU = neonatal intensive care unit; ACEs = adverse childhood experiences; PPD = postpartum depression; PPA = postpartum anxiety; * $p < 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

3.3. Qualitative Findings

See Table 4 for a summary of sample characteristics of the 22 individuals who participated in interviews. Data are organized by outcomes groups. 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 perinatal 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 practices. See Table 5 for themes, description of themes, and example quotes.

Table 4. Phase II participant characteristics by outcomes group ($n = 22$).

Characteristic	0–1 (Low) Adverse Outcomes ($n = 11$)		3–4 (High) Adverse Outcomes ($n = 11$)	
	<i>n</i>	%	<i>n</i>	%
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

Table 4. Cont.

Characteristic	0–1 (Low) Adverse Outcomes (<i>n</i> = 11)		3–4 (High) Adverse Outcomes (<i>n</i> = 11)	
	<i>n</i>	%	<i>n</i>	%
Annual Household Income (M = USD 44,181)				
<USD 25,000	5	45.45	6	54.55
USD 25,000–49,999	3	27.27	3	27.27
USD 50,000–74,999	1	9.09	0	0.00
USD 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

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; and EPDS = Edinburgh Postnatal Depression Scale.

Table 5. Qualitative themes and sample quotes.

Themes	Description	Sample Quotes
Social support	Participants commonly reported that adequate social support helped or a lack of adequate social support hurt their postpartum adjustment and mental health.	High-adverse-outcomes Group: “... 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.”—LM, age 21 Low-adverse-outcomes Group: “... 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.”—EF, age 32
Economic factors	Economic factors notably affected mothers’ postpartum adjustment and mental health. Participants said financial responsibilities influenced the ability to afford childcare and basic needs, as well as decision-making about whether or not one or both parents could take unpaid time off (and how much) postpartum.	High-adverse-outcomes Group: “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 Low-adverse-outcomes Group: “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.’”—VP, age 33

Table 5. *Cont.*

Themes	Description	Sample Quotes
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.	High-adverse-outcomes Group: “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.”—JG, age 40 Low-adverse-outcomes Group: “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.”—EF, age 32
Self-care practices	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.	High-adverse-outcomes Group: “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.”—SV, age 24 Low-adverse-outcomes Group: “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.”—JS, age 36

Social support. Participants with high adverse outcomes frequently noted that inadequate social support contributed to their postpartum struggles. Participants described a lack of connection with family and friends and/or troubling isolation. Some said others did not understand their situation and needs or it was more difficult to socialize because of childrearing demands. Conversely, participants with few adverse outcomes reported social support in the form of helpful partners, assistance with household chores and childcare, and emotional connection were instrumental in their positive postpartum adjustment.

Economic factors. Participants in the high-adverse-outcomes group reported substantial financial stress that contributed to prenatal and postpartum stress. Some participants said it was too costly to pay for childcare when compared to their income. Overall, participants doing well emotionally were less likely to identify financial concerns.

Work-related factors. In both groups, most participants reported efforts to balance work and family life and the desire to work less outside the home. In contrast, some mothers found returning to work rewarding, noting that it enabled them to support their family financially and regain a sense of confidence. Participants with postpartum mental health struggles reported difficulty in returning to work more often than those in the low-adverse-outcomes group. Participants felt distracted by their family-related needs while at work, including child care arrangements, breastfeeding, children’s illnesses, limited sleep, and the desire to spend more time with their children.

Self-care practices. Participants in both groups reported prioritizing sleep, exercise, healthy eating, and/or hobbies improved their overall health. Participants in the high-

adverse-outcomes group noted more frequently than those in the low-adverse-outcomes group that a lack of time and support were barriers to good physical and mental health. These participants reported longing for rejuvenating activities, time with other adults, and time alone. Additionally, some reported feeling guilty for wanting time to themselves. Participants in the low-adverse-outcomes group spoke of caring practices—both the presence and absence of self-care—less often than those in the high-outcomes group. However, some reported that they made an effort to engage in self-care by prioritizing their individual interests and health behaviors.

4. Discussion

Using a comprehensive measure of ACEs and a fairly diverse sample of perinatal mothers, we found a statistically significant relationship between mothers' ACEs and PPD/A. This finding aligns with several prior studies that have also found an association between ACEs and PPD/A (Prentice et al. 2022; Shin et al. 2021). However, in our study, when the moderating variables of social support, discrimination, and material hardship were added to the regression model, the direct effect of ACEs on PPD/A was no longer significant; simultaneously, these three variables emerged as significant direct predictors, explaining more variance in PPD/A than did ACEs. Contrary to our hypothesis, no interaction effects were found between ACEs and each moderator variable, indicating that social support, discrimination, or material hardship did not moderate the ACEs and PPD/A relationship. Instead, the quantitative findings suggest that social support, material hardship, and discrimination may operate as independent risk or protective factors for PPD/A, potentially representing pathways through which early adversity influences PMD. Having adequate social support, financial security, choice in working, a supportive and flexible work environment, and the time and capacity for self-care may serve as key protective factors influencing mothers' PMH and adjustment to motherhood. Both the quantitative and qualitative findings align with prior research that found inadequate social support (Feinberg et al. 2022; Inekwe and Lee 2022), experiences with discrimination (Rodriguez et al. 2019; Weeks et al. 2022), and low socioeconomic status (Cooke et al. 2025; Szurek-Cabanias et al. 2024) are associated with an increased likelihood of poor PMH outcomes.

The qualitative findings largely supported the results of our quantitative analysis by corroborating the significance of social support (lack of supportive relationships, feelings of isolation) and material hardship (financial stress, little choice in working) to mothers' PMH (Feinberg et al. 2022; Inekwe and Lee 2022; Cooke et al. 2025). It should be noted that cultural norms may shape the expectation and availability of support in motherhood. While some cultures may emphasize, "it takes a village," others may experience social isolation as a result of migration, acculturation, or displacement thus experiencing more PMH (Anderson et al. 2017; Reupert et al. 2022). Our qualitative findings diverge from our quantitative findings regarding the influence of discrimination. While discrimination was significantly associated with PPD/A in our final regression model, participants rarely mentioned discrimination during interviews. Possible reasons for this include that participants did not experience discrimination, participants were not directly asked about experiences with discrimination, participants may have been uncomfortable discussing discrimination and bias due to cultural norms, and participants may have been hesitant to discuss discrimination with an interviewer who may have been perceived as more privileged (e.g., White racial identity, involvement in academia).

Our findings 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 related to lack

of paid parental leave and work-related factors) on health outcomes over the life course. The results of our quantitative analysis, in particular, also invoke consideration of a kind of ranking of priorities similar to Maslow's hierarchy of needs (Maslow 1943). In the context of Maslow's theory, social support, discrimination, and material hardship would represent essential human needs of safety and belonging that are required for resiliency, healthy well-being, and reaching one's full potential. In this way, struggles related to social support, discrimination, and material hardship may 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 as well, including partners and children.

4.1. Implications

Our results may inform preconception and perinatal counseling regarding the potential influence of ACEs and social and economic factors on PMH. Based on our results, healthcare providers may consider screening their perinatal patients for ACEs (Flanagan et al. 2018) and assessing for social support and risk factors such as financial insecurity, material hardship, and experiences of discrimination. Discussions about these topics may also facilitate connecting patients with mental health treatment and other supportive resources, if needed. Practitioners may also consider educating patients on the importance of self-care and social connection for mental health and employing a trauma-informed approach, which may assist in normalizing mothers' PMH experiences as results or byproducts of various adverse experiences rather than individual pathology (Siverns and Morgan 2019). It is important to develop culturally responsive interventions that recognize the diversity of experiences, avoiding assumptions that uniform models of 'support' or 'self-care' apply across all cultural groups, and instead tailoring approaches to the needs of each individual.

Our results also support the implementation of policies and programs aimed at better supporting the mental health of perinatal women. Specifically, our findings suggest policies and programs such as 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 may positively influence perinatal mental health outcomes. Though there is a need for more longitudinal research on the effects of parental leave policies on PMH outcomes, existing US-based research suggests that paid and longer maternity leave is associated with improved postpartum health and mental health, including reduced likelihood of PPD (Aitken et al. 2015; Chatterji and Markowitz 2008; Dagher et al. 2014). Further, European studies have found paid maternity leave policies may not only improve postpartum mental health—particularly for first-time and low-income mothers—but also positively affect mental health into older age and allow for increased social and economic participation (Avendano et al. 2015; Butikofer et al. 2018). Research has also shown that increased household income, increased access to education, conditional cash transfer programs, improved housing conditions, and housing vouchers are associated with higher levels of mental well-being, particularly among marginalized groups (Williams and Purdie-Vaughns 2015). Additionally, our study results support the consideration of innovative community-driven interventions to improve perinatal mental health, which show promise in improving mental health outcomes through purposeful, grassroots efforts to improve social and environmental conditions in areas with increased health disparities (National Academies of Sciences and Medicine 2017). Importantly, these interventions must be culturally responsive and tailored to the social and cultural contexts of diverse perinatal populations to maximize their effectiveness and equity.

Longitudinal research is needed to examine how ACEs, social support, discrimination, and material hardship influence maternal mental health trajectories across the life course and whether outcomes differ for mothers with versus without these experiences. Future studies should also explore the cultural, historical, and social contexts shaping how adversity, mental health, and support are understood and experienced—including how cultural norms influence motherhood expectations, how specific ethnic or immigrant groups face unique challenges, and how culturally rooted coping strategies foster resilience and self-care. Additionally, research should elucidate the mechanisms (latent, pathway, or cumulative effects) linking these variables to maternal mental health outcomes.

4.2. Limitations

The findings of this study should be considered within the context of limitations. The potential for recall bias exists as participants retrospectively reported ACEs, along with their perinatal experiences, via self-report and are subject to memory inaccuracies. Likewise, symptoms of PPD/A were based on symptom scales and not through receiving a clinical diagnosis. While the scales capture women who may be at risk for PPD/PPA, we could not infer if participants met the formal diagnostic criteria for PPD/PPA. Lastly, results from the qualitative interviews may not be generalizable due to the relatively homogeneous sample. Recruitment via online platforms and social media likely yields a sample that is socioeconomically skewed and culturally specific, potentially limiting applicability to women from other cultural, linguistic, or socioeconomic backgrounds. Further, the clinical significance of specific ACE thresholds may vary across cultural contexts and populations. Future research with larger and more diverse samples could examine gradient effects and enhance the external validity of these findings.

5. Conclusions

Perinatal mental health conditions (PMH) are the most common complications of pregnancy and the first year postpartum which may be complicated by ACEs. Adverse childhood experiences may affect symptoms of PPD/A due to motherhood triggering memories and a review of one's own childhood experiences. The transition to motherhood may challenge cognitive and emotional responses that may be identified as PPD/A. The study employed a modified explanatory-sequential mixed-methods design, with 306 participants completing an online survey and, subsequently, 22 of them taking part in qualitative interviews. The quantitative findings suggest that ACEs can serve as predictors of PPD/A, but social support, material hardship, and discrimination may have greater impact on PMH. The results of the qualitative analysis suggest that having adequate social support, financial security, choice in working, a supportive and flexible work environment, and the time and capacity for self-care may serve as key protective factors influencing mothers' PMH and adjustment to motherhood, particularly when aligned with their cultural needs. The findings can be used to inform clinical practices including counseling for preconception and perinatal conditions, screening of perinatal patients for ACEs and assessing for both protective and risk factors, and guiding policy decisions to better support the mental health of perinatal women.

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