

Long-Term Effects of the *Pregnant Moms' Empowerment Program* (PMEP) on Intimate Partner Violence Revictimization, Maternal Mental Health, and Child Internalizing and Externalizing Problems

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Objectives: The present study examined effects of the *Pregnant Moms' Empowerment Program* (PMEP) 4 years following program completion. It was hypothesized that women who participated in PMEP during pregnancy would experience less intimate partner violence revictimization and fewer depressive and post-traumatic stress symptoms as compared to women in the no-treatment control condition. Further, it was expected that the children women were pregnant with when they participated in PMEP, who are now preschool-aged, would exhibit fewer internalizing and externalizing problems as compared to children of women in the control condition. **Method:** Participants were 78 women (56.9% of the original sample) assigned to the PMEP intervention ($n = 46$) or control condition ($n = 32$) during pregnancy. Outcomes assessed were intimate partner violence (Revised Conflict Tactics Scales), depressive symptoms (Center for Epidemiologic Studies Depression Scale), posttraumatic stress symptoms (Posttraumatic Stress Disorder Checklist–5), and children's internalizing and externalizing problems (Child Behavior Checklist). **Results:** Regression models controlling for baseline levels of each dependent variable indicated that 4 years posttreatment, women assigned to the PMEP condition, as compared to women in the control condition, reported significantly lower levels of depressive symptoms. Poisson regression analyses indicated that women who received PMEP reported significantly fewer intimate partner violence experiences than women in the control condition. Children of women who participated in PMEP exhibited significantly fewer externalizing problems than children of women in the control condition. **Conclusions:** Findings show that participating in PMEP resulted in benefits not only for women who received the treatment but also for their children 4 years following the intervention.

What is the public health significance of this article?

Results indicate that the *Pregnant Moms' Empowerment Program* has long-lasting effects for women's intimate partner violence revictimization and depression, but not their posttraumatic stress symptoms. Findings also show benefits of the *Pregnant Moms' Empowerment Program* for children of women who received the intervention, particularly on children's externalizing problems.

Keywords: domestic violence, depression, posttraumatic stress, behavior problems

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The risk of experiencing intimate partner violence (IPV) is high during pregnancy, especially for low-income women (Miller-Graff & Cheng, 2017). IPV is defined as coercive control, physical, emotional, sexual, and financial threat and/or abuse from a current or former partner (Breiding et al., 2015). Prenatal IPV has negative effects on women's health (World Health Organization, 2021), as well as negative intergenerational impacts on their children (McMahon et al., 2011). Given the ramifications of prenatal IPV, it is critical to develop targeted interventions and evaluate short- and long-term effectiveness (Howell et al., 2017). The *Pregnant Moms' Empowerment Program* (PMEP) is an intervention that targets the unique needs of pregnant, IPV-exposed women. Previous evaluations have established the efficacy of PMEP for maternal mental health and revictimization, as well as parenting outcomes up to 1-year postpartum (Howell et al., 2024; Miller-Graff et al., 2022). The longer term impacts of PMEP participation compared to treatment-as-usual are untested. The present study examined the effects of PMEP on women's IPV revictimization and mental health, as well as their children's internalizing and externalizing behavior problems, approximately 4 years following program participation.

Prenatal IPV Exposure

Miller-Graff and Cheng (2017) examined rates of physical, psychological, and sexual IPV among 101 pregnant women participating in the Special Supplemental Nutrition Program for Women, Infants, and Children. They found that the prevalence for past-year IPV exposure was 44.5%, which exceeds the national average of lifetime exposure and indicates high risk for IPV during pregnancy (Miller-Graff & Cheng, 2017). Hellmuth et al. (2013) sampled 180 women recruited from university-affiliated health clinics during the first 18 weeks of their pregnancy; they also found rates of IPV that were higher than the national average (67.7% reported experiencing psychological IPV victimization, 31.3% reported minor physical IPV victimization, and 8.3% reported severe physical IPV victimization). Further, studies examining the patterns of violence women report prenatally indicate that any type of IPV exposure is likely to continue during pregnancy when experienced prior to pregnancy (Taillieu & Brownridge, 2010). For others, pregnancy may be a time of increased risk for initial exposure to IPV, with 3.8%–40.0% of women reporting IPV for the first time during pregnancy (Taillieu & Brownridge, 2010). Studies examining prenatal IPV frequency and severity have demonstrated that women who experience any violence during pregnancy report an increase in both IPV frequency and severity compared to women who are not pregnant (Díaz-Olavarrieta et al., 2007; Taillieu & Brownridge, 2010). Importantly, experiencing any IPV during pregnancy also strongly predicts postpartum violence (Mueller & Tronick, 2020).

There is evidence of some heterogeneity in the rates of prenatal IPV, likely due to inconsistent methodology for assessing this form of violence. Behaviorally based measures of IPV, like the *Revised Conflict Tactics Scales* (CTS2; Straus et al., 1996), have been established as the gold standard for assessment; however, the use of this measure (and other similar measures) varies widely. In a recent scoping review of prenatal IPV, Kim et al. (2024) found that the most frequently used measure of IPV was the CTS (Straus, 1979; 25.8%), but eight studies (25.7%) relied on one or two questions to capture partner violence (Kim et al., 2024). Importantly, prenatal IPV exposure was most frequently operationalized by dichotomizing

scores to create “exposed” and “non-exposed” groups (58.1%, $n = 18$; Kim et al., 2024). A sum score or frequency total score for any IPV exposure regardless of type was the second most frequently used design (35.5%, $n = 11$). Most studies collapsed different types of IPV during pregnancy into a total score (e.g., Ahmad et al., 2022; Bair-Merritt et al., 2010; Eckenrode et al., 2017; Jack et al., 2019; Martinez-Torteya et al., 2017), while few studies used the CTS2 to examine different subtypes of IPV (e.g., Bair-Merritt et al., 2010; Miller-Graff & Cheng, 2017).

Effects of Perinatal IPV on Women and Children

Perinatal IPV has adverse consequences on women's mental health. For example, physical, psychological, and sexual IPV during and after pregnancy have been strongly linked to perinatal depressive symptoms and posttraumatic stress symptoms (PTSS; Paulson, 2022). These relations have been demonstrated proximal to pregnancy and across time (World Health Organization, 2021). Further, violence has a cumulative impact, with more exposure yielding worse outcomes (McMahon et al., 2011). Any type of perinatal IPV can also negatively affect infants and children, such as through a greater risk for preterm birth, low birth weight, and maternal and infant death at delivery (World Health Organization, 2021). Perinatal IPV exposure may also confer risk into the preschool years and beyond, with a recent systematic review establishing that maternal IPV during pregnancy can negatively impact psychological and behavioral outcomes for infants and preschool-aged children (Kim et al., 2024). For example, prenatal IPV exposure was significantly associated with externalizing problems, such as acting-out behavior and aggression, among preschool-aged children (Ahmad et al., 2022; Flach et al., 2011; Whitaker et al., 2006). The relationship between prenatal IPV exposure and preschool-aged children's internalizing problems has received minimal attention in the literature, but an association between these variables was demonstrated by Martinez-Torteya et al. (2017) in their study of young children. As such, prenatal IPV exposure is a documented risk factor for the mental and behavioral health of women and their children, both proximal to pregnancy and in the long term.

Prenatal Interventions for Women Exposed to IPV

There is a clear need for interventions to support women exposed to prenatal IPV, yet systematic reviews show a dearth of effective evidence-based services for this population (Howell et al., 2017; Mercier et al., 2024). The Nurse–Family Partnership and Child–Parent Psychotherapy, for example, target women's and their children's well-being and have been shown to improve outcomes like children's exposure to maltreatment and mothers' parenting and mental health (Eckenrode et al., 2017; Lavi et al., 2015). Notably, these programs span multiple months or years and, while valuable, may be a difficult commitment for many women and organizations to make in the face of resource constraints. Brief interventions are likely to be an important strategy to increase the feasibility of accessing services. Importantly, few interventions have published follow-up data at more than 1 year postpartum, which limits information on the long-term effectiveness of programs provided around the time of pregnancy (Van Parys et al., 2014). Interventions with longer term follow-up data have not identified significant effects on either participants' quality of life (at 2 years postpartum; Jack et al., 2019) or IPV victimization (at 7–9 years postpartum; Bair-Merritt et al., 2010).

Findings are more variable regarding the long-term effects of IPV-focused interventions delivered during the perinatal period on child outcomes (Mercier et al., 2024). Some studies have demonstrated attenuating effects over time (e.g., at 4 years postpartum; Olds et al., 1994), whereas others had significant between-group effects at 15-year follow-up (Eckenrode et al., 2017). Additionally, although interventions for mothers of preschool-aged children have been shown to reduce child victimization and improve maternal mental health (e.g., Fergusson et al., 2013; Lieberman et al., 2006), to our knowledge, no brief interventions delivered during pregnancy have assessed the impacts of those interventions in the preschool years. This represents a critical gap in the literature, given that exposure to IPV in utero can result in later social, psychological, and behavioral problems in preschool-aged children (Howell et al., 2021).

The Present Study

Few brief interventions address the needs of pregnant women exposed to IPV, and the downstream impact of mothers' participation in these treatments on their children's health and functioning has been largely unexplored. The present study examined the effects of the PMEP approximately 4 years postintervention. We hypothesized that women who participated in PMEP during pregnancy would experience less IPV and fewer PTSS and depressive symptoms as compared to women in a no-treatment control condition. We also hypothesized that the children women were pregnant with when they participated in PMEP, who are now preschool-aged, would show fewer internalizing and externalizing problems as compared to the children of women in the control condition.

Method

Participants

Participants were 78 women who either received the PMEP intervention ($n = 46$) or were assigned to a no-treatment control condition ($n = 32$) during pregnancy. Participants in the 4-year follow-up were 18–41 years old at baseline ($M_{\text{age}} = 28.08$, $SD = 5.96$). Most identified as Black (66.67%), followed by 19.23% as White and 8.97% as multiracial; 3.84% were Latina or Hispanic. Children were, on average, 43 months old at the follow-up assessment ($SD = 2.06$; range 37–48 months); 44.9% were male. Income was assessed by asking women, "What is your current monthly household income from all sources, including a job, child support, welfare, etc.?" On average, at baseline, participants reported their income was \$1,028.15 per month ($SD = \920.88). This is substantially lower than the median income in the United States, which ranges from \$4,920 to \$5,725 per month (J. L. Semega et al., 2017; J. Semega et al., 2020).

Procedure

PMEP was evaluated at two sites in the United States, one in the Midwest and one in the Southeast. The sites used a parallel protocol, and institutional review boards at both participating universities approved study procedures. Recruitment efforts included referrals from community organizations, flyers in public locations, and study staff attending community events and prenatal clinics. Eligibility criteria included being pregnant and between 10 and 34 weeks gestational age, being at least 16 years old, endorsing past-year IPV, and speaking English fluently. At screening, IPV was assessed using

the *Abuse Assessment Screen* (Soeken et al., 1998). The Abuse Assessment Screen was successful in accurately identifying women exposed to IPV—at the baseline assessment, all participants endorsed the presence of IPV as indicated by past-year sexual violence, physical violence, or IPV-related injury (94.9%) or psychological abuse that exceeded levels of psychological abuse found in community samples (Straus & Sweet, 1992; 5.1%). For women experiencing psychological abuse only, the average number of past-year events was 51.

Eligible women were scheduled for a baseline assessment (T1). Baseline enrollment began in 2017. At T1, participants completed written informed consent. Group assignment (i.e., intervention or no-treatment control) was done using alternative, successive, sequenced treatment and control blocks, with a target block size of $n = 5$ participants. This was a quasirandomized control design. The present study used data from the 4-year follow-up assessment (T5), which began in 2021. All women who participated in the baseline assessment ($N = 137$) were invited to complete a semi-structured survey by telephone or videoconference. This T5 assessment took 30 min, during which project staff read questionnaires aloud in an interview format. Participants were compensated for their time with a gift card and received a resource list for local services.

Measures

IPV

Participants completed 39 items drawn from the CTS2 (Straus et al., 1996). Specifically, women completed all victimization items from the Physical Assault, Sexual Coercion, Psychological Aggression, and IPV-Related Injury scales. Items assessing nonviolent verbal negotiation were not administered. For each item, women reported how often the event occurred in the past year, with response options ranging from 0 (*not at all*) to 6 (*more than 20 times*). Items were scored using the frequency midpoint scoring method, which estimates the overall frequency of each event in the past year by scoring each item at the midpoint (e.g., 2–4 times in the past year = 3; 6–10 times in the past year = 8). Items were summed for a total IPV score, with possible scores ranging from 0 to 975. Reliability for total IPV scores at T5 was calculated using Cronbach's α ($\alpha = .80$).

Depressive Symptoms

Participants completed the 20-item Center for Epidemiologic Studies Depression Scale (Radloff, 1977). On a 4-point scale, ranging from 0 (*rarely or none of the time*) to 3 (*most or all of the time*), women indicated how often they experienced symptoms associated with depression throughout the prior week. Four positively valenced items were reverse-scored; then, all 20 items were summed to create a total score. Possible total scores range from 0 to 60, with higher scores indicating more depressive symptoms. Reliability for T5 Center for Epidemiologic Studies Depression Scale scores was calculated using Cronbach's α , with $\alpha = .90$.

PTSS

Participants completed the 20-item Posttraumatic Stress Disorder Checklist–5 (PCL–5; Weathers et al., 2013). On the PCL–5, women were first asked to identify the most traumatic event they experienced in their lifetime; importantly, efforts were made to ensure the comfort of participants during particularly sensitive measures such

as the PCL-5, including offering breaks. Since all measures were administered by an interviewer, the interviewer privately noted whether the event qualified as a Criterion A trauma. If women were unable to identify a Criterion A trauma, interviewers were trained not to proceed with the remainder of the PCL-5, and these data were left as missing. For all women who endorsed a Criterion A trauma, they proceeded to indicate if they had experienced a series of PTSS over the prior month. Each item was scored on a 5-point scale, with women reporting if they were 0 (*not at all*) to 4 (*extremely*) bothered by the symptom. Items were summed to create a total score, with possible scores ranging from 0 to 80 and higher scores indicating greater PTSS. Cronbach's α was calculated ($\alpha = .92$).

Children's Internalizing and Externalizing Problems

Mothers completed the 100-item Child Behavior Checklist (CBCL) for ages 1.5–5 (Achenbach & Rescorla, 2001). Women reported whether their children experienced a broad range of concerns over the past 2 months, with responses on a 3-point scale from 0 (*not true*) to 2 (*very true/often true*). The measure can produce a total score, domain-level scores (i.e., externalizing behavior problems; internalizing behavior problems), syndrome scale scores, or *DSM-oriented* scale scores. In the present study, the domain-level scores of externalizing behavior problems ($\alpha = .91$) and internalizing behavior problems ($\alpha = .86$) were used. Possible scores range from 0 to 48 for externalizing behavior problems and from 0 to 72 for internalizing behavior problems.

Intervention

The PMEP is a five-session manualized group intervention that is provided prenatally. Groups meet once weekly over 5 weeks, and each session lasts 2 hr, so participants receive 10 total hours of contact. PMEP is grounded in empowerment theory, or the process through which individuals “gain mastery and control over their lives” by power being redistributed via knowledge about available resources in the environment (Zimmerman, 2000, p. 708). The social ecological theory of resilience also guides PMEP, in which resilience is viewed as one's ability to negotiate and navigate toward resources at the individual, relational, and contextual levels (Ungar & Liebenberg, 2011). Together, these theories emphasize fostering sources of support, accessing resources, developing healthy and supportive relationships, and drawing on assets to improve functioning.

PMEP groups were coled by two trained facilitators who held at least a bachelor's degree. They included psychology masters and doctoral students, masters of social work students, mental health counseling students, and community providers. All facilitators received weekly supervision from a licensed clinical psychologist while co-leading a PMEP group. Prior to starting a group, facilitators received 10 hr of training on prenatal IPV rates and consequences, strategies for working with vulnerable populations, techniques for leading group-based treatments, and PMEP intervention content. PMEP groups were delivered in English and held in community spaces (e.g., family justice center conference room) or the campus research spaces of the study principal investigators. Transportation and childcare were provided, if needed.

The PMEP curriculum covers content on IPV, mental health, perinatal health, infant care, the mother–child relationship, and early parenting. Treatment modalities include didactics and

psychoeducation, group discussion, self-disclosure, and coaching through interactive activities. Session 1 focuses on building group cohesion, establishing participants' sense of safety in the group, and growing women's social support networks. IPV is introduced as a focal point, and it is acknowledged that all women in the group are pregnant and have experienced IPV. Participants also develop safety plans that are individually tailored and action oriented. Session 2 opens with a discussion about intergenerational patterns of violence, including participants' own possible childhood exposure to IPV in their families of origin. These early-life experiences are connected to how women view their own parenting in the context of IPV, and time is spent discussing strategies to end cycles of violence. Psychoeducation on how violence contributes to perinatal psychopathology and mental health in both the prenatal and postnatal periods is offered to help women explore their emotions and how they are affected by experiencing IPV. Session 2 also discusses how mental health and early parenting interact and affect women's self-efficacy. Session 3 utilizes a cognitive behavioral approach to inform participants about cognitive restructuring, behavioral activation, problem solving, conflict resolution strategies, and coping. Ways to foster healthy romantic relationships, parent–child relationships, and relationships with extended family are also brainstormed. Session 4 brings attention to perinatal health for mothers and their infants, labor and delivery, and coordinating care across providers. Women generate ideas and discuss with each other instrumental supports in the community that may assist with perinatal care. Time is also spent on newborn safety, infant eating and safe sleeping practices, and perinatal medical and mental health care. Interactive learning activities are used to enhance parenting confidence and efficacy. Session 5, the final session, focuses on positive parenting. Women learn ways to identify, attune to, and respond to infant cues, as well as how to facilitate enjoyable interactions and play with infants. Hands-on, interactive activities are used to deepen learning. Time is also spent discussing coparenting. This session closes with a review of the content covered in treatment, during which women reflect on their experiences and process group termination.

Slightly more than half (57.8%) of PMEP groups were coded for treatment fidelity; program elements were executed with 90.8% fidelity. Previous PMEP evaluations indicated that participation in the program was associated with fewer experiences of IPV revictimization and improvements in maternal mental health (Miller-Graff et al., 2022). Importantly, these effects were only evaluated through 1-year postpartum.

Sample Size and Power Analysis

Post hoc power analyses in Optimal Design (Spybrook et al., 2005–2013) indicated that 136 participants were needed to detect medium effects, and 55 participants were needed to detect large effects with .80 power ($\alpha = .05$). The T5 follow-up, which had 78 participants, is powered to detect large effects.

Missing Data Analysis and Participant Flow

There were no significant differences at baseline in IPV exposure, depressive symptoms, or PTSS between women who participated in the T5 assessment and those who did not. There was no significant difference between the likelihood of participating in the T5 assessment across treatment and control conditions ($\chi^2 = 0.42$). Participant flow

across waves can be found in the Consolidated Standards of Reporting Trials diagram (see Figure 1). Of the 78 participating women at T5, there was some scale-level missingness (see Tables 1 and 2). Three participants had missing data because they failed to complete the study-relevant measures ($n = 1$ missing all key measures; $n = 1$ missing CTS2, PCL-5, and CBCL; $n = 1$ missing PCL-5 and CBCL). One participant declined to complete the CTS2 and PCL-5 but completed all other study measures. For the PCL-5, three women were not able to identify a Criterion A trauma, so the interviewers did not administer the consequent symptom-specific items. One participant declined to complete the PCL-5. Three women did not complete the CBCL because of miscarriage or loss of the child. These data were left as missing. Little's missing completely at random test was nonsignificant, suggesting that data were missing completely at random ($\chi^2 = 14.60, p = .879$).

Analysis Plan

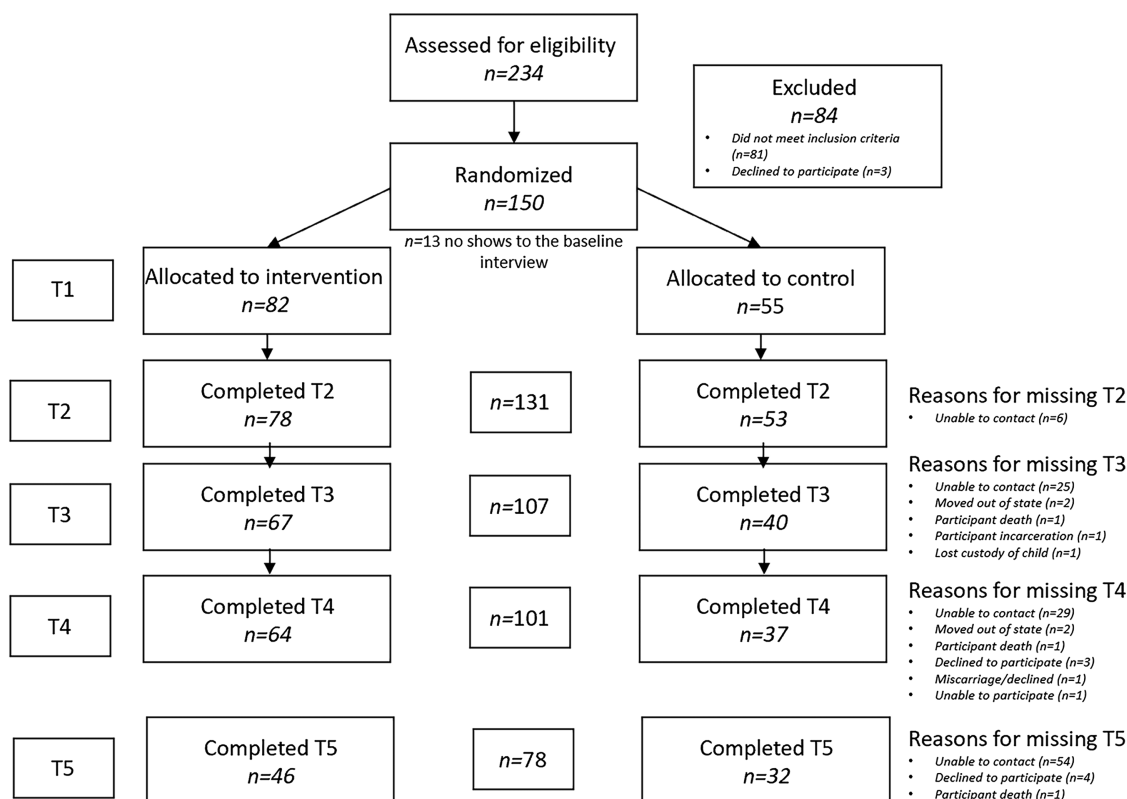
Differences in groups at T5 were assessed using an intent-to-treat analysis in a regression framework, with baseline values of each dependent variable included as a covariate and errors clustered within the individual. Because depression and PTSS demonstrated characteristics of a normal distribution, these models used multivariate linear regression. Children's internalizing and externalizing problems demonstrated evidence of positive skew and were therefore analyzed using multivariate linear regression with bootstrapping.

Poisson regression was used to model IPV, which was an events-based count variable. IPV was examined as a total score because subscale data did not meet distributional assumptions required for analysis (e.g., some subscales were significantly zero-inflated). The total scale IPV score had better distributional parameters that were more suited to meet the required assumptions for robust estimation of parameters. There were no significant differences across sites on any of the key study outcome variables except for symptoms of depression ($t = -2.13, p = .037$), which were higher at the Southeast site. A robustness check was therefore conducted by adding site as a covariate to this regression model.

Transparency and Openness

Participant consents did not include permission for public release of deidentified data. As such, the data analyzed in this study are not available in a repository. Processed data for verification or meta-analyses are available from the first author by request. Data were analyzed using Stata Special Edition (Version 18.0; StataCorp. LLC, 2023). All syntax for the analyses can be found in Supplemental Material 1. Two articles have been published examining effects of the PMEP intervention through 1-year postpartum (Howell et al., 2024; Miller-Graff et al., 2022). No articles have been published from the long-term follow-up data used in the present study. We have reported how we determined sample size, all data exclusions, and all manipulations, and we

Figure 1
Consolidated Standards of Reporting Trials Diagram



Note. T1 = pretest; T2 = posttest; T3 = 3 months postpartum; T4 = 12 months postpartum; T5 = 4 years posttest.

Table 1
Descriptive Statistics for IPV Over Time, by Condition

Assessment wave	Total IPV <i>n</i> = 75		Physical assault <i>n</i> = 75		Sexual coercion <i>n</i> = 75		Psychological aggression ^a <i>n</i> = 75		Injury <i>n</i> = 75	
	PMEP <i>n</i> = 45	Control <i>n</i> = 30	PMEP <i>n</i> = 45	Control <i>n</i> = 30	PMEP <i>n</i> = 45	Control <i>n</i> = 30	PMEP <i>n</i> = 45	Control <i>n</i> = 30	PMEP <i>n</i> = 45	Control <i>n</i> = 30
T1										
<i>M</i> (<i>SD</i>)	145.80 (134.00)	151.93 (152.29)	37.00 (59.94)	44.97 (56.80)	16.78 (30.50)	18.43 (36.89)	79.16 (49.35)	74.47 (51.88)	12.87 (21.58)	14.07 (24.06)
T5										
<i>M</i> (<i>SD</i>)	15.44 (19.42)	35.53 (44.64)	2.67 (6.00)	5.60 (13.43)	0.89 (2.81)	2.63 (7.15)	11.40 (16.97)	26.07 (29.86)	0.48 (1.25)	1.23 (3.88)

Note. Reported *n*s reflect participants at T5. PMEP = Pregnant Moms' Empowerment Program; IPV = intimate partner violence; T1 = Time 1; T5 = Time 5.
^a Psychological aggression scores indicate those with scores of 12+ incidents rather than 1+ incidents, consistent with cutoffs suggested for levels of conflict that exceed those observed in community samples as a part of typical couple conflict (Straus & Sweet, 1992).

followed Journal Article Reporting Standards (Appelbaum et al., 2018). Study measures are either publicly available or can be obtained from the measure developers. The PMEP treatment manual can be obtained from the first author. The larger PMEP trial from which these data came was retrospectively registered at <https://clinicaltrials.gov>. Its registration number is NCT05011825.

Results

Of the 137 baseline participants, 56.9% (*n* = 78) participated in the 4-year follow-up. For those women who completed both baseline and 4-year follow-up, prenatal IPV exposure at baseline indicated an average of 151 IPV incidents in the year prior to enrollment. See Table 1 for descriptives of IPV exposure by condition and Table 2 for descriptive data on maternal and child mental health by condition.

Results indicated that, at 4 years posttreatment, women who received PMEP, as compared to women in the control condition, reported significantly lower levels of depressive symptoms (*B* = −6.00, *p* = .019). This finding was robust to the addition of site as a covariate. Poisson regression analyses also indicated that the women who received PMEP reported significantly fewer IPV experiences than women in the control condition (incident rate ratio = 0.44, *p* = .004). Although the distributional properties of the IPV subscales did not allow for them to be analyzed statistically, the patterns that emerged across all subscales aligned with the total IPV finding in that, on average, women receiving PMEP reported less frequent physical assault, sexual coercion, psychological aggression, and IPV-related injury than women in the control condition (see Table 1). The pre-school-aged children of women who participated in PMEP exhibited significantly fewer externalizing problems (*B* = −4.46, *p* = .045) than children of women in the control condition. No differences between PMEP and the control condition were observed in women's PTSS or children's internalizing problems (see Table 3).

Discussion

The present study examined the long-term effects of PMEP on women's depression, PTSS, and IPV revictimization, as well as their children's internalizing and externalizing problems. In partial support of the first hypothesis, women who participated in PMEP experienced less frequent IPV and fewer depressive symptoms compared to women in the control condition over 4 years after participating in the intervention. There were no differences between conditions in PTSS. Both the significant and nonsignificant findings mirror those from the 12-month postpartum evaluation of PMEP (Miller-Graff et al., 2022), which illustrates the long-term stability of program effects. In contrast, other perinatal interventions for IPV-exposed women report mixed results of treatments' effects on IPV and depression and no successful treatment for reducing PTSS (see Van Parys et al., 2014, for review). Findings from the present study represent, to the authors' knowledge, the first long-term evaluation of an effective, brief intervention for women exposed to prenatal IPV in the United States.

Additionally, it is important to acknowledge that participants in the present study were racially diverse, with the majority identifying as Black (66.67%). Psychological research continues to underrepresent non-White individuals in treatment studies (Williams et al., 2013), which limits our understanding of how treatments may be differentially

Table 2*Descriptive Statistics for Maternal and Child Mental Health Over Time, by Condition*

Assessment wave	Depressive symptom (clinical cutoff ≥ 16) <i>n</i> = 77		Posttraumatic stress symptom (clinical cutoff ≥ 31) <i>n</i> = 70		Children's externalizing behavior problem <i>n</i> = 71		Children's internalizing behavior problem <i>n</i> = 71	
	PMEP	Control	PMEP	Control	PMEP	Control	PMEP	Control
T1	26.85 (13.48)	25.68 (11.61)	37.69 (16.00)	38.61 (15.50)				
% above clinical cutoff	78.3%	77.4%	71.43%	67.9%				
T5	14.63 (10.09)	20.35 (11.42)	28.50 (17.26)	31.29 (17.30)	12.79 (9.07)	17.24 (9.13)	9.07 (8.16)	10.96 (6.14)
% above clinical cutoff	34.8%	61.3%	47.6%	42.9%				

Note. Reported *ns* reflect participants at T5. PMEP = Pregnant Moms' Empowerment Program; T1 = Time 1; T5 = Time 5.

efficacious across racial and ethnic groups. The effectiveness of PMEP in reducing IPV revictimization and depressive symptoms 4 years posttreatment in a sample of racially diverse women is an important contribution to the literature, as findings suggest the PMEP curriculum may be beneficial for women from a variety of racial backgrounds. The reduction of IPV exposure and depressive symptoms also occurred in the context of additional life stressors, such as low family income. Individuals living at lower income levels often face unique barriers to treatment access and care utilization (Santiago et al., 2013), so the present study findings are particularly encouraging in supporting the mental health and functioning of individuals who may otherwise have difficulty accessing health care resources and engaging in treatment.

The long-term effect of PMEP on reducing depressive symptoms 4 years following treatment is a particularly unique contribution to the literature, and it is especially notable that women receiving the intervention reported average depressive symptoms below the clinical threshold at T5, while women in the control condition continued to report average symptoms of depression that exceeded the clinical cutoff on the Center for Epidemiologic Studies Depression Scale (see Table 2). Notably, at this 4-year follow-up point, 34.8% of women in the PMEP condition reported depressive symptoms above the clinical cutoff, while 61.3% of women in the control condition reported symptoms above the clinical threshold, which illustrates the

clinical significance of these findings and the meaningful clinical impact of the intervention. It is well-established that maternal depression is associated with an increased risk of emotional and behavioral concerns in children (Goodman, 2019); therefore, addressing depressive symptoms during the prenatal period is critical in promoting psychosocial well-being across generations for both mothers and children. Prior studies incorporating multiyear follow-up assessments on maternal mental health and IPV prevalence have primarily evaluated intensive home visitation programs (Bair-Merritt et al., 2010; Olds et al., 2004; Van Parys et al., 2014), with much more limited evaluations of briefer interventions. The discernable, positive, long-term effects of PMEP for both reduced IPV exposure and depressive symptoms support the efficacy of a brief alternative to more intensive interventions.

Although the present study findings are promising, it is also important to acknowledge that data were not collected on whether the large decreases in IPV exposure from baseline to 4-year follow-up were due to participants separating from their violent partners. Given that previous studies indicate that abuse in prior relationships strongly predicts any abuse in future relationships across all types of violence (Mueller & Tronick, 2020; Spencer et al., 2019), reducing IPV revictimization is still a key positive result of PMEP participation. While women receiving PMEP did report significantly less

Table 3*Regression Models Examining the Effects of PMEP*

Variable	IPV revictimization ^a <i>n</i> = 75		Depressive symptom <i>n</i> = 77		Posttraumatic stress symptom <i>n</i> = 77		Children's externalizing behavior problem <i>n</i> = 71		Children's internalizing behavior problem <i>n</i> = 71	
	<i>B</i> (SE) [95% CI]	<i>p</i>	<i>B</i> (SE) [95% CI]	<i>p</i>	<i>B</i> (SE) [95% CI]	<i>p</i>	<i>B</i> (SE) [95% CI]	<i>p</i>	<i>B</i> (SE) [95% CI]	<i>p</i>
Baseline level of dependent variable	1.00 (0.002) [0.997, 1.00]	.924	0.14 (0.09) [−0.04, 0.33]	.113	0.25 (0.12) [0.02, 0.49]	.037				
PMEP	0.44 (0.12) [0.24, 0.77]	.004	−6.00 (2.50) [−10.98, −1.02]	.019	−2.90 (4.09) [−11.05, 5.26]	.481	−4.46 (2.22) [−8.81, −0.10]	.045	−1.90 (1.72) [−5.26, 1.47]	.271
Constant	34.70 (9.54) [20.24, 59.50]	<.001	16.64 (2.82) [11.01, 22.26]	<.001	21.66 (5.40) [10.93, 32.39]	<.001	17.24 (1.78) [13.74, 20.73]	<.001	10.96 (1.22) [8.56, 13.35]	<.001
<i>R</i> ²			9.55%		5.93%		5.42%		1.39%	

Note. PMEP = Pregnant Moms' Empowerment Program; IPV = intimate partner violence; SE = standard error; CI = confidential interval.

^a IPV was assessed using a frequency/count variable analyzed using Poisson regression—reported coefficients are therefore incident rate ratios where values under 1 reflect lower likelihood of occurrence.

frequent IPV than women in the control condition, it is noteworthy that all participants, regardless of condition, exhibited large reductions in IPV exposure. Research shows that partner aggression decreases as individuals age (O'Leary & Woodin, 2005), and rates of IPV are higher for younger women as compared to older women (Thompson et al., 2006), so this overall reduction in IPV may be a function of participants aging. Further, relationships characterized by violence typically last from less than 1 year to 5 median years (Thompson et al., 2006), so it is possible that IPV relationships were waning across all participants. Additionally, selection bias may factor in, as women interested in participating in a study that explores conflict in relationships may have been poised to take action to reduce their IPV exposure or end their violent relationship. Many women were recruited from organizations serving IPV-exposed individuals, so they were involved at some level in services to address violence. Further, all participants received a resource list of local agencies serving individuals affected by violence during the screening process, so women in either condition may have independently sought support from these organizations.

In partial support of the second hypothesis, PMEP participants' children experienced significantly fewer externalizing problems compared to the children of women in the control condition. These results highlight the multigenerational impact of intervening during the prenatal period. Such findings are especially important since prenatal IPV can result in later social, psychological, and behavioral problems in older children (Howell et al., 2021; Kim et al., 2024). More specifically, externalizing behavior problems during the preschool years predict social difficulties, aggression, and mental health problems in adulthood (Arslan et al., 2021). To our knowledge, no prior prenatal IPV intervention evaluations have assessed long-term effects on preschool-aged children's functioning, making the current findings a novel advancement over previous work. PMEP's ability to mitigate the early-life development of externalizing problems is an important contribution to the intervention literature and holds great promise for improving externalizing in early childhood and potentially across the life course. By intervening during pregnancy, mothers may be empowered via the parenting supports, resilience resources, and skills necessary to promote a stronger start for their children, which can bolster children's mental health and reduce their behavior problems.

There were no significant differences by condition found for children's internalizing problems. Previous work has shown that children's exposure to IPV is more strongly associated with their externalizing problems as compared to internalizing problems (Vu et al., 2016). It is worth noting that maternal reports indicated relatively low rates of child internalizing problems (see Table 2), which may have contributed to the lack of significant findings in this domain. This low base rate could be due to externalizing problems being more outwardly recognizable than internalizing problems, which may have made them more apparent to mothers. Additionally, externalizing behavior problems are relatively more common during the preschool developmental period as compared to internalizing problems, so assessing children at later developmental epochs would be a fruitful direction for future work to develop a more well-rounded understanding of the impacts of PMEP on children's functioning. Altogether, results from the present study extend past shorter term evaluations of PMEP by showing lasting benefits of program participation on aspects of maternal and child health 4 years following the intervention.

Limitations and Future Directions

Results should be interpreted in light of important limitations. First, data were gathered only from mothers' perspectives, so future studies should include other informants (e.g., child reports) and observational assessments. Second, only broadband aspects of child functioning were examined. Future work should assess specific domains (e.g., children's depressive symptoms, children's aggression) that may provide deeper insight into the impact of PMEP on children's functioning. Third, the assessment of Criterion A traumas was not specifically tied to IPV, so future work should explore the Criterion A events participants endorsed on the PCL-5 and whether event type influenced treatment outcomes. Participants may have experienced PTSS due to traumas unrelated to prenatal IPV, which could have contributed to the nonsignificant treatment effects on trauma symptoms. Another measurement limitation relates to the assessment of relationship status. At the T5 assessment, we did not explore participants' relationship with the partner they reported on at baseline. Additionally, we did not assess if women were separated from their partner at the 4-year follow-up. A more in-depth exploration of women's relationship to current or former partners would offer nuance to the interpretation of IPV revictimization findings. Finally, sample retention was somewhat low. Future evaluations should consider ways to increase retention given the value of long-term follow-up. Future studies with a larger sample size should also examine mechanisms of change to assess if theory-based factors contribute to treatment effects. Further, with a larger sample, it would be possible to test site-specific differences and regional effects.

Conclusions

Study findings indicate PMEP participation was associated with reductions in IPV revictimization and improvements in both women's mental health and their children's functioning over 4 years after women participated in the intervention. These results are especially promising because PMEP is brief and requires minimal resources to implement. Importantly, this is the first time such effects have been reported for a brief intervention delivered to IPV-exposed women during pregnancy. Given that lasting benefits were found across multiple outcomes for women and children, efforts should be made to replicate these findings with a larger sample and disseminate the program more broadly.

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