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RESEARCH

Intimate Partner Violence and Gestational Weight Gain in a Population-Based Sample of Perinatal Women

Jeanne Lorraine Alhusen, Ruth Geller, Caitlin Dreisbach, Leeza Constantoulakis, and Anna Maria Siega-Riz Q13

Correspondence
Jeanne Lorraine Alhusen, PhD, CRNP, RN, School of Nursing, University of Virginia, 202 Jeanette Lancaster Way, Charlottesville, VA 22903.
jla7e@virginia.edu

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ABSTRACT

Objective: To examine the effects of intimate partner violence (IPV) at varied time points in the perinatal period on inadequate and excessive gestational weight gain.

Design: Retrospective cohort using population-based secondary data.

Setting: Pregnancy Risk Assessment Monitoring System and birth certificate data from New York City and 35 states.

Participants: Data were obtained for 251,342 U.S. mothers who gave birth from 2004 through 2011 and completed the Pregnancy Risk Assessment Monitoring System survey 2 to 9 months after birth.

Methods: The exposure was perinatal IPV, defined as experiencing physical abuse by a current or ex-partner in the year before or during pregnancy. Adequacy of gestational weight gain (GWG) was categorized using 2009 Institute of Medicine guidelines. Weighted descriptive statistics and multivariate logistic regression models were used.

Results: Approximately 6% of participants reported perinatal IPV, 2.7% reported IPV in the year before pregnancy, 1.1% reported IPV during pregnancy only, and the remaining 2.5% reported IPV before and during pregnancy. Inadequate GWG was more prevalent among participants who experienced IPV during pregnancy and those who experienced IPV before and during pregnancy (23.3% and 23.5%, respectively) than in participants who reported no IPV (20.2%; $p < .001$). Participants who experienced IPV before pregnancy only were significantly more likely to have excessive GWG ($p < .001$). Results were attenuated in the multivariate modeling; only participants who experienced IPV before pregnancy had weakly significant odds of excessive GWG (adjusted odds ratio = 1.14, 95% CI [1.02, 1.26]).

Conclusion: The association between perinatal IPV and inadequate GWG was explained by confounding variables; however, women who reported perinatal IPV had greater rates of GWG outside the optimal range. Future studies are needed to determine how relevant confounding variables may affect a woman's GWG.

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Jeanne Lorraine Alhusen, PhD, CRNP, RN, is an associate professor in the School of Nursing, University of Virginia, Charlottesville, VA.

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Gestational weight gain (GWG) is an important predictor of immediate and future health of a pregnant woman and her infant (Siega-Riz et al., 2009). Specifically, excessive GWG is associated with an increased risk of large-for-gestational age newborns, cesarean birth, postpartum complications, postpartum weight retention, and childhood obesity (American College of Obstetricians and Gynecologists, 2013; Durie, Thornburg, & Glantz, 2011; Rasmussen, Catalano, & Yaktine, 2009; Salihu, Weldeselasse, Rao, Marty, & Whiteman, 2011). GWG recommendations aim to optimize health outcomes for women and their infants. In 2009, The Institute of Medicine (IOM) released revised GWG guidelines, based on prepregnancy body mass index (BMI) ranges for underweight, normal weight, overweight, and obese women. The recommendations include a weight gain of 28 to 40 pounds for women Q1 who are underweight (BMI < 18.5 kg/m^2), 25 to 35 pounds for normal weight (BMI = 18.5–24.9 kg/m^2) women, 15 to 25 pounds for overweight (BMI = 25–29.9 kg/m^2) women, and 11 to 20 pounds for obese (BMI ≥ 30) women (Rasmussen et al., 2009). Despite these recommendations, researchers suggest that up to 84% of overweight and 74% of obese pregnant

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The purpose of our study was to examine the population-level patterns of intimate partner violence and gestational weight gain.

women gain more than the recommended amount (Johnson et al., 2013).

The determinants of gestational weight gain are multifactorial and involve biological, social, psychological, and environmental factors and the interactions among them (Hill et al., 2013). For example, the strongest predictor appears to be pregravid BMI, perhaps because women with a greater BMI are already on the trajectory to gain more weight (Davis, Stange, & Horwitz, 2012; Webb, Siega-Riz, & Dole, 2009). Age is also a determinant, with younger women gaining more weight than older women but older women entering pregnancy with a greater BMI. Evidence also exists that GWG decreases with greater parity (Siega-Riz et al., 2009). In the psychological domain, women with lower self-esteem, with more anxiety or depression, and under more stress due to multiple factors, including experiencing intimate partner violence, have greater weight gains in some but not all studies. This is, in part because of coping mechanisms that use food for soothing (Alhusen, Ayres, & DePriest, 2016; Laraia, Siega-Riz, Dole, & London, 2009). For some women, these unstable psychological conditions can contribute to loss of appetite and/or increased metabolic activity that results in inadequate weight gain. Given the interconnectedness of these factors during a time when women are encouraged to gain weight anyway, understanding the actual driver for adequacy of weight gain and when health care professionals should intervene is complex and perplexing.

Intimate partner violence (IPV) during pregnancy is a significant public health issue associated with negative outcomes for women and children (Silverman, Decker, Reed, & Raj, 2006). Research suggests between 3% and 9% of women experience IPV during pregnancy, although there are well-established risk factors associated with greater rates of abuse, including young age, single marital status, less education, and low socioeconomic status (Alhusen, Lucea, Bullock, & Sharps, 2013; Alhusen, Ray, Sharps, & Bullock, 2015; Martin, Mackie, Kupper, Buescher, & Moracco, 2001; Saltzman, Johnson, Gilbert, & Goodwin, 2003; Vest, Catlin, Chen, & Brownson, 2002). Research to examine the association between IPV and GWG is quite limited and is largely contained to small community samples, with researchers suggesting an association between IPV and inadequate GWG (Kearney, Munro, Kelly, & Hawkins, 2004; Parker, McFarlane, & Soeken, 1994). Drawing from the Oklahoma Pregnancy Risk Assessment Monitoring System (PRAMS), researchers found that IPV around the time of pregnancy was associated with excessive and inadequate GWG among women 35 years and older (Beydoun, Tamim, Lincoln, Dooley, & Beydoun, 2011). Thus, the population-level patterns of IPV and GWG remain unclear. We advance this knowledge base through analysis of U.S. population-based data to examine the association between IPV and GWG.

Methods

We analyzed data from 2004 through 2011 from PRAMS, an ongoing multistate surveillance project conducted by the U.S. Centers for Disease Control and Prevention (CDC) in collaboration with participating state health departments. Per CDC guidelines, data are released for states that meet a minimum response rate, specifically 70% or greater for 2004 through 2006 and 65% or greater for 2007 through 2011. Included in our analysis are data from New York City and 35 states.

PRAMS uses stratified systematic random sampling of 100 to 250 mothers who gave birth to a live newborn from participating states each month. Birth certificates are used as the sampling frame, and high-risk populations, including women who gave birth to low-birth-weight infants, are oversampled. Self-reported survey responses are linked to birth certificate data. Weighting accounts for survey design, nonresponse, and the potential for clustering around particular hospitals, counties, or time of year. Further information is available on PRAMS methodology via the implementation manual (CDC, 2007).

Sample

Of a total 323,926 participants, 2.3% ($n = 7,500$) were excluded for lack of data about IPV. An additional 10.8% of participants ($n = 34,082$) were excluded for lack of data about prepregnancy BMI or GWG. Of those who remained, 11.0% ($n = 31,002$) were excluded for missing data regarding one or more potential confounders, which resulted in a final sample size of 251,342 (see Figure 1).

Ruth Geller, MHS, is a graduate research assistant in the School of Nursing, Johns Hopkins, Baltimore, MD.

Caitlin Dreisbach, BSN, RN, is a doctoral student in the School of Nursing, University of Virginia, Charlottesville, VA.

Leeza Constantoulakis, MS, RN, is a doctoral student in the School of Nursing, University of Virginia, Charlottesville, VA.

Anna Maria Siega-Riz, PhD, is a professor in the School of Medicine, University of Virginia, Charlottesville, VA.