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Recent intimate partner violence as a prenatal predictor of maternal depression in the first year postpartum among Latinas

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Abstract The study aims to determine if recent intimate partner violence (IPV) is a prenatal risk factor for postpartum depression (PPD) among pregnant Latinas seeking prenatal care. A prospective observational study followed Latinas from pregnancy through 13 months postpartum. Prenatal predictors of PPD included depression, recent IPV exposure, remote IPV exposure, non-IPV trauma history, poverty, low social support, acculturation, high parity, and low education. Postpartum depression was measured at 3, 7, and 13 months after birth with the Beck's Depression Inventory—Fast Screen. Strength of association was evaluated using bivariate and multivariable odds ratio analysis. Subjects were predominantly low income, mono-lingual Spanish, and foreign-born, with mean age of 27.7. Recent IPV, prenatal depression, non-IPV trauma, and low social support were associated with greater likelihood of PPD in bivariate analyses. Recent IPV and prenatal depression continued to show significant association with PPD in multivariate analyses, with greater odds of PPD associated with recent IPV than with prenatal depression (adjusted OR=5.38, $p<0.0001$ for recent IPV and adjusted OR=3.48, $p<0.0001$ for prenatal depression). Recent IPV exposure is a strong, independent prenatal predictor of PPD among Latinas. Screening and referral for both IPV and PPD during pregnancy may help reduce postpartum mental health morbidity among Latinas.

Keywords Intimate partner violence · Postpartum depression · Latina mental health · Prenatal depression

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Introduction

Intimate partner violence (IPV), a highly prevalent problem occurring in up to 20% of couples in the USA (Field and Caetano 2005), has adverse consequences for the physical and mental health of exposed women (Campbell and Lewandowski 1997). Women with histories of violence during pregnancy, estimated to be as high as 15% (Gazmararian et al. 1996), are at greater risk of adverse neonatal health outcomes as well as depression and poor mental health quality of life through the first year postpartum (Kendall-Tackett 2007). Episodes of depression occurring in the first year postpartum, referred to as postpartum depression (PPD; Gaynes et al. 2005), are estimated to occur in up to 20% of births (Morbidity and Mortality Weekly Report 2008) and are associated with parenting difficulties and emotional, behavioral, and cogni-

tive deficits in young children (Center on the Developing Child at Harvard University 2009; Goodman and Gotlib 1999). While several studies suggest that violence is a predictor of postpartum depression (Kendall-Tackett 2007; Records and Rice 2009; Lancaster et al. 2010), violence from several sources and time periods is frequently combined, thus shedding little light on IPV and its possible role in PPD. We are aware of only one study from Hong Kong that examined intimate partner abuse in pregnancy and PPD, finding a significant association with maternal depressive symptoms at 1-week postpartum (Tiwari et al. 2008). More research on the potential role of IPV exposure in maternal postpartum depression may increase our understanding of mental health disparities in postpartum health.

Latinos are the fastest growing population group in the USA, and Latinas experience postpartum depressive symptoms at two to three times the estimated national average (Kuo et al. 2004). Prenatal predictors of PPD include prenatal depression (Yonkers et al 2001), as well as low social support, poor marital relationship quality, low partner support, low self-esteem, stressful life events, low socioeconomic status, single parenthood, unplanned/unwanted pregnancy, and violent trauma history, and, for foreign-born, immigrant status (Beck 2001; Robertson et al. 2004; Milgrom et al. 2008; Rubertsson et al. 2005; Zelkowitz et al. 2008; Diaz et al. 2007). Recent postpartum depression meta-analyses have not found many studies that have specifically examined IPV's role in the development of postpartum depression. However, poor marital relationship quality and low partner support, both of which may be aspects of IPV, have been identified as significant predictors (Beck 2001; Robertson et al. 2004). There is some evidence that low acculturation may have a protective effect on maternal mental health status of Latinas (Heilemann et al. 2003), but other studies find no benefits (Martinez-Schallmoser et al. 2003; Davilla et al. 2009). Acculturation may exert its influence indirectly through its association with stronger PPD predictors such as low social support. Limitations in conceptualization and measurement of acculturation may explain conflicting results of different studies (Beck et al. 2007; Siatkowski 2007; Beck 2007; Zambrana et al. 1997).

Our prospective longitudinal study of pregnant and postpartum Latinas, *Proyecto Cuna*, is one of the few studies that have examined the impact of partner violence on depression observed among Latinas in the perinatal period. We recently reported that lifetime IPV is a significant predictor of prenatal depression among Latinas (Rodriguez et al. 2008). The purpose of the study reported herein is to determine if recent IPV is a prenatal risk factor for PPD among pregnant Latinas seeking prenatal care. We consider implications of the findings from this study for prenatal screening and reduction of maternal mental health morbidity among Latinas in the USA.

Materials and methods

Design

Proyecto Cuna (Baby Cradle) is a prospective observational study begun in 2003 to study the impact of trauma on maternal and child health outcomes among Latinas. The current study draws on the first four waves of data collection—the prenatal interview and three postnatal follow-up interviews—to examine the impact of IPV exposure during or within 12 months of pregnancy on depressive symptoms within the first year after birth. Subjects were recruited from the obstetrical clinics of a private medical center and a health maintenance organization serving greater Los Angeles.

Sampling and recruitment methods

From January 2003 to January 2004, women were recruited from the obstetric/gynecologic clinics at two private nonprofit health care organizations (one private medical center and one health maintenance organization) where more than 80% of the population was Latina. Subjects were recruited from both clinics during the same time period. Participants were eligible for the study if they were at least 18 years of age, self-identified as Latina (defined as Hispanic or Latina, with examples of Mexican, Mexican-American, Chicana, Puerto Rican, Cuban, or other Hispanic or Latino group), at least 12 weeks pregnant, not planning to move in the next 12 months, and planning to raise the child themselves. Subjects meeting these eligibility criteria were screened for history of IPV exposure prior to study enrollment. The recruitment goal was to have equal representation of pregnant women reporting previous exposure to intimate partner violence and no previous exposure to intimate partner violence, in order to acquire a sufficient number of subjects with IPV exposure histories to allow for comparison to subjects with no IPV exposure history. We conducted continuous sampling in order to attain the target in each category. All women attending the clinics were approached by research staff and informed about the study while they waited to be seen for appointments ($n=1,728$). Of these, 140 women declined to be screened, and 44 women were either approached twice or were lost before they could be approached. A total of 1,544 were successfully screened and 682 met initial eligibility criteria. We attained the target number of non-IPV-exposed subjects prior to achieving the number of IPV-positive subjects and therefore continued to sample until the IPV-positive target was filled. Of 682 initially eligible, nine IPV+ women and 46 IPV− women refused enrollment. A total of 118 IPV negative and 92 IPV positive ($N=210$) were enrolled in the study. Four hundred seventeen IPV

negative women were turned away because of the quota of IPV-negative women being filled.

Procedures

Prenatal interviews were conducted in person by two bilingual and bicultural interviewers either in English or Spanish in a private clinic room. Baseline/prenatal interviews were conducted from March 2003 through January 2004. Postnatal interviews at 3, 7, and 12 months postpartum were conducted in person at home or via telephone phone. The 3-month postpartum interviews were conducted from July 2003 to July 2004. The 7-month postpartum interviews were conducted from December 2003 to December 2004. The 12-month postpartum interviews were conducted from June 2004 through April 2005. Participants were compensated $20 for the prenatal interview and $40 for each of three postnatal follow-up interviews. All participants gave their informed consent prior to their inclusion in the study. All screening, consent procedures, and data collection protocols were approved by the Institutional Review Board of the University of California—Los Angeles School of Medicine and thus were performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

Measures

IPV status was classified for each subject based on responses to three questions from the Abuse Assessment Screen (AAS). The AAS is a clinical screen used to identify frequency and perpetrator of psychological (engendering fear), physical (slapped, kicked, hit), and sexual abuse (forced sex) within the preceding 12 months (Soeken et al. 1998). A significant positive relationship ($p<0.01$) was found between the AAS and the other instruments while reliability was established at 97.5% using a test–retest method. The screener was modified for purposes of this study to distinguish lifetime from more recent exposure to partner violence. Women reporting violence that occurred during or within 12 months of the current pregnancy were classified as "recent" IPV exposure. "Remote" exposure to IPV was indicated by positive responses to "ever exposed" to AAS screen items and "no" to AAS items during pregnancy or within 12 months preceding the pregnancy.

Non-IPV trauma history included exposure to physical, emotional, or sexual abuse perpetrated by someone other than an intimate partner or spouse and/or significant emotional trauma, experienced either prior to age 18 or in adulthood. Non-IPV trauma was measured by an eight-item index that consisted of four items from the Adverse Childhood Experiences Survey (experiencing prior to age 18 verbal abuse, engendering of fear, being slapped/kicked/

hit, or being physically injured by a parent or other family member in the home; Felitti et al. 1998) and four items from the Green Trauma History Questionnaire (lifetime experience of forced sex from someone other than an intimate partner, physical assault from someone other than an intimate partner, witnessing family violence as a child, and losing a parent through death, divorce, separation; Green 1996). Positive responses to each item were summed to create a trauma history score ranging from 0 to 8, with higher scores reflecting a higher amount of non-IPV trauma.

Social support was measured during pregnancy with a modified version of the Medical Outcomes Study Social Support Survey, which is a 19-item multi-dimensional scale with four subscales for social support associated with health outcomes: tangible (e.g., someone to help you if confined to bed), affectionate (e.g., someone who shows you love and affection), positive social interaction (someone to get together with for relaxation), and emotional/informational (e.g., someone you can count on to listen to you when you talk; Sherbourne and Stewart 1991). Using a five-point Likert scale from 1 (none of the time) to 5 (most of the time), subjects rated frequency of occurrence of nine items from the MOS scale that reflect each subscale. Cronbach alphas for the four subscales used in the prenatal questionnaire study ranged from 0.79 to 0.93. Scores on each item were summed and range from 9 to 45, with higher scores indicating more available social support.

Acculturation was assessed with two proxy measures: language of the interview and proportion of lifespan spent in the USA. Language of interview was dichotomized into English vs. Spanish. Subjects who chose to have the interview conducted in Spanish were considered more acculturated. Proportion of lifespan spent in the USA is the number of years living in the USA as a percent of chronological age.

Parity was measured as the number of previous live births reported in the prenatal interview.

Poverty index is a continuous measure of the ratio of reported total family income to the 2004 published federal poverty levels, based on the number of persons in the household (U.S. Department of Health and Human Services 2006). The *Poverty Index Score* is a continuous measure and indicates the extent to which the subjects' total income is above, at, or below the federal poverty level. Higher scores indicate higher level of income above the poverty threshold. Additional demographic variables included dichotomized employment status—working full- or part-time vs. not working; dichotomized marital status—single, divorced, separated vs. married; and dichotomized foreign-born status—USA born vs. born outside the USA.

Depression during pregnancy and at each of three follow-up interviews was assessed with the Beck Depres-

sion Inventory Fast Screen (BDI-FS) for Medical Patients (Beck et al. 2000), derived from the full-scale Beck's Depression Inventory—II (BDI) to screen for major depressive disorders in medical settings (Steer et al. 1999). The BDI is one of three recognized tools with acceptable levels of prenatal and postpartum depression detection (Gaynes et al. 2005). Items are rated on severity using a four-point scale ranging from 0 to 3. For purposes of this study, depression is defined as scoring at or above the cut-point for depressive symptoms that are associated with a highly probable diagnosis of major depressive disorder (4 or greater). For this sample, alpha reliability was high ($\acute{a}$=0.85).

Sample characteristics

Two hundred ten participants met eligibility criteria and consented to participate in the study during pregnancy. At study entry, 21.4% (*n*=46) reported recent IPV exposure, 21.4% (*n*=46) reported remote IPV exposure, and 56.2% (*n*=118) reported no history of IPV exposure. Mean age at intake was 27.7 years (ranging from 18 to 42 years of age), and 76% (*n*=160) were born outside of the USA. Poverty index scores ranged from a low of 0.27 to a high of 7.3, with an overall mean score of 1.3. Most women were married at study entry (88%), and fewer than half reported working full- or part-time (44.4%, *n*=91). Complete follow-up data through 1-year postpartum was available on 190 of the original 210 subjects. The 20 subjects lost to follow-up did not differ significantly from the 190 women available through the 1-year postnatal follow-up in age, poverty level, and history of IPV exposure (either remote or recent) but were significantly more likely to have been foreign-born, single, and working full- or part-time.

Analysis

A two-phase analytic strategy was used to identify prenatal predictors of postpartum depression for Latinas. Predictor variables include (1) demographic characteristics of poverty level, marital status, employment status, and foreign-born status; (2) psychosocial factors of prenatal depression, parity, recent IPV exposure, remote IPV exposure, non-IPV trauma history, and social support; and (3) acculturation measures of language of interview and proportion of life spent in the USA. The main outcome measure of depression identified at 3, 7, or 13 months postpartum, using the cut-point of 4 on the BDI-FS. In the bivariate phase, odds ratios were calculated for the association of each prenatal predictor with the dichotomous outcome of positive or negative for depression at any one of the three postnatal observation periods. Predictor variables contained continuous and dichotomous measures. Variables that demonstrated a statistically significant association with

postnatal depression in the bivariate analysis were advanced to a multivariable stage. All odds ratios and confidence intervals were calculated using the logistic regression function. Statistical significance was pre-established at less than or equal to 0.05 level for the bivariate and multivariate phases. SAS Software version 3.0 was used for all analyses.

Results

Table 1 presents the descriptive statistics for all study variables. We found an exceptionally high rate of depression in the postpartum period, with 43.7% (*n*=83) of mothers meeting our criteria for depression in one or more observations during the first year postpartum. In the prenatal period, 33.2% of subjects met criteria for significant depression symptoms, 20.5% reported recent IPV exposure, and 23.2% reported remote IPV exposure. Mean number of non-IPV trauma events reported by Latinas was 1.1, with an actual score range of as few as 0 and as many as 7. The mean score on the *Social Support Scale* was 37.2, which is on the high end of the scale and suggests that subjects report a substantial amount of social support. The mean score on the *Poverty Index* was 1.3, indicating that mean family incomes are on average 30% above the federal poverty threshold. Thus, study subjects are predominantly low income, despite the fact that at least 40% report working themselves and that most (91.5%) are married. The majority were born outside of the USA (75.3%), and only a small proportion are single (9.5%).

Table 1 Descriptive statistics for study predictor and outcome variables (*N*=190)

Prenatal predictors	% (#) or mean (SD)
Demographic	
Poverty index score	1.3 (1.4)
Single marital status	9.5% (18)
Employment status—not working	58.4% (108)
Foreign-born	75.3% (143)
Psychosocial	
Prenatal depression	33.2% (63)
Parity	1.3 (1.2)
Recent IPV	20.5% (39)
Remote IPV	23.2% (44)
Non-IPV trauma (# of events)	1.1 (1.5)
Social support	37.1 (7.2)
Acculturation	
Interview language—Spanish	60.5% (115)
Proportion of life in the USA	0.55 (0.35)
Outcome	
Any postpartum depression	43.7% (83)

Four of 12 prenatal predictors met the criteria of statistical significance at minimum of 0.05 or better: prenatal depression, recent IPV exposure, social support, and non-IPV trauma history (Table 2). Three of the four significant prenatal predictors were highly statistically significant ($p<0.0001$): prenatal depression, recent IPV exposure, and low social support. The odds ratio of 1.29 for number of non-IPV trauma events was significant at the 0.05 level (95% CI=1.06–1.57, $p\leq0.05$).

The odds ratios for two of the four prenatal predictors that were significant in the bivariate analysis were found to be significantly associated with postpartum depression in the multivariate analysis (Table 3). After controlling for the other three variables in the model, the adjusted odds ratio for recent IPV trauma was 5.38 and highly significantly associated with postpartum depression ($p\leq0.0001$). The adjusted odds ratio for prenatal depression was also highly significantly associated with postpartum depression (OR= 3.48, $p\leq0.0001$). Non-IPV trauma history and low social support were not significant predictors of postpartum depression after recent IPV and prenatal depression were controlled for in the multivariate model.

Discussion and conclusions

In this sample of Latina mothers, we found that prenatal depression is a predictor of postpartum depression and that recent IPV exposure is also an independent contributor to maternal depression in the first year postpartum. The finding that IPV is a significant independent predictor of postpartum depression may lend convergent evidence regarding the impact of marital relationship quality to postpartum depression identified through meta-analyses

(Beck 2001; Robertson et al 2004). For Latinas, our results regarding IPV and postpartum depression are consistent with emerging evidence of the impact of dyadic relationship quality on postpartum depression (Diaz et al. 2007).

While recent IPV was highly predictive of postpartum depression, remote IPV was not. These findings point to the importance of distinguishing timing of exposure to partner violence. Our study also underscores the importance of distinguishing IPV trauma from other trauma history. Both IPV trauma and non-IPV trauma were found to be significant predictors of prenatal depression among pregnant Latinas (Rodriguez et al. 2008), after controlling for other variables. For postpartum depression, however, non-IPV trauma was associated with postpartum depression in the bivariate analysis but not significant after other variables were controlled for. Non-IPV trauma may be less important a factor in postpartum depression than it is in prenatal depression, or, alternatively, the effects of non-IPV trauma on depression in the postpartum period may be diminished by the presence of prenatal depression as a very strong and well-recognized predictor of postpartum depression. Also, in contrast to the previous findings of social support as a significant predictor of prenatal depression (Rodriguez et al. 2008), social support was not a significant predictor of postpartum depression in the final model. This finding regarding social support may reflect the limitations of our sample size and the high levels of social support in this sample (mean=37.1, with a total possible score of 45), limiting our ability to detect a significant relationship between social support and postpartum depression. Alternatively, both trauma history and low social support may have an indirect relationship to postpartum depression. Future studies with a larger sample size should explore possible causal pathways for the influence of trauma history

Table 2 Bivariate results: odds ratios and 95% CI for predictors of depression up to one year postpartum (N=190)

Predictors in prenatal period	Odds ratio	95% CI	B	Wald	p value
Prenatal depression (ref. none)	4.68	2.44–8.95	1.54	21.67	<0.0001[a]
Parity (# previous live births)	1.05	0.83–1.34	0.05	0.05	0.670
Recent IPV (ref. remote/none)	7.38	3.16–17.20	1.99	21.40	<0.0001[a]
Remote IPV (ref. none)	1.70	0.83–3.52	0.53	2.08	0.149
Non-IPV trauma (# of events)	1.29	1.06–1.57	0.26	6.39	0.01[b]
Social support	0.91	0.87–0.95	−0.09	15.59	<0.0001[a]
Interview language—Spanish (ref. English)	0.75	0.42–1.35	−0.28	0.93	0.335
Proportion of life in the USA	1.89	0.82–4.41	0.64	2.22	0.136
Foreign-born (ref. US-born)	1.48	0.77–2.88	0.39	1.37	0.241
Poverty score	0.88	0.69–1.10	−0.13	1.29	0.255
Marital status—not married (ref. married)	0.46	0.17–1.24	−0.78	2.36	0.124
Employment status—not working (ref. working)	1.23	0.68–2.23	0.21	0.48	0.489

[a] Significant at <.0001

[b] Significant at ≤0.05

Table 3 Adjusted odds ratios from multiple logistic regression: prenatal predictors of postpartum depression

Variable	Unadjusted OR	Adjusted OR	95% CI adjusted OR	*p* value
Prenatal depression	4.68	3.48	1.74–6.98	0.000[a]
Recent IPV trauma	7.38	5.38	2.21–13.08	0.000[a]
Non-IPV trauma Hx	1.29	1.10	0.88–1.38	0.389
Social support	0.91	0.96	0.91–1.01	0.092

[a] Significant at <0.0001

and low social support on maternal postpartum depression in the presence of IPV.

Acculturation as measured in this study was not associated with depression in the first year postpartum. This finding could be the result of limited variability in the measures we used. The acculturation level of most of the subjects in this study was low. Three quarters of the sample were foreign-born, and despite the fact that foreign-born subjects spent on average half of their lives in the USA, the majority of subjects were monolingual Spanish. The remaining subjects were, with minor exceptions, bilingual. This negative finding could also be the result of the types of acculturation proxy measures we examined—language, foreign-born status, and length of time exposed in the USA. However, the results of studies of the impact of acculturation on depression among childbearing Latinas are mixed, suggesting the need to examine how acculturation is measured and what is being measured. Heilemann et al (2003) found acculturation as measured by early exposure prior to age 18 to be associated with elevated depression among childbearing Latinas. In the study of Kuo et al. (2004), acculturation was measured by a three-factor index that included language use, media, and ethnic social relationships and was not significantly associated with depression in the postpartum period. Other measures of acculturation that assess acculturation as a multi-dimensional process may be more appropriate to developing a clearer understanding of the impact of acculturation on perinatal mental health status. Martinez-Schallmoser et al. (2003) have developed a revised measure of acculturation for Latinas that includes four dimensions of the process of acculturation: language, observation of ethnic traditions, preservation of cultural heritage, and semantic descriptions of Mexican men and women. This measure was a good predictor of postpartum depression among Mexican-American women. Future studies should employ more refined measures of acculturation such as the one developed by Martinez-Schallmoser et al. (2003) and that take into account the context and process of acculturation. Appropriate sample sizes that are diverse enough to allow for meaningful comparisons and causal analysis are also needed.

The elevated risk of postpartum depression that was found to be associated with recent IPV exposure in this study adds to the growing body of evidence that the role of IPV in postpartum depression may be under-estimated.

Thus, consideration should be given to screening pregnant women not only for mood disorders but for IPV as well (Austin and Lumley 2003; Buist et al. 2002). In addition, we have substantial evidence that other psychosocial factors increase the risk of postpartum depression, either alone or in combination with IPV and prenatal depression, suggesting the need for broader psychosocial assessment during the prenatal period. Although more evidence is needed on the outcomes of depression screening in the perinatal period (Gaynes et al. 2005), studies in adult clinic populations indicate that screening reduces depression (Buist et al. 2002). For perinatal mood disorders, screening tools can successfully identify depression, including in Spanish-speaking populations (Le et al. 2009). Perinatal depression screening may be a pathway to care (Buist et al. 2002), and therefore, more research is needed that assesses how case finding through screening links to treatment and improved maternal mental health. Since perinatal depression is associated with psychosocial factors, a biopsychosocial, multi-modal approach to intervention may be needed to effectively address perinatal mental health morbidity that would include community referrals in addition to screening (Ross et al. 2004; Cunningham and Zayas 2002).

Domestic violence screening during pregnancy continues to be challenging for clinicians to implement, despite recommendations and clinicians' awareness of them (Bunn et al. 2009). Incorporating screeners for mood regulation problems, domestic violence, and other psychosocial factors into a single, brief tool may increase the probability that clinicians will conduct screening during pregnancy to detect excess risk and offer appropriate referrals. The ALPHA Tool is a 15-item screener that incorporates reliable and valid screeners for mood regulation problems, partner violence, and other known psychosocial predictors and is currently being tested in several countries, with early promising indicators of feasibility and effectiveness in clinicians' detection of additional needs and providing referrals when indicated (Blackmore et al. 2006; Austin et al. 2009). In the USA, appropriate engagement of providers in detection of IPV and mental health morbidity risk during pregnancy and throughout the first year postpartum should be explored as part of a comprehensive approach to postpartum maternal health care (Cheng et al. 2006).

With 43% of Latinas meeting the cut-point for depression in this sample, our study is consistent with other

reports of high rates—in excess of 40%—of postpartum depression among Latinas (Kuo et al. 2004). We found that IPV is a contributor to postpartum depression among Latinas. The extent to which IPV explains observed postpartum mental health disparities among Latinas in a general clinic population, however, needs further exploration. Our sampling strategy represents an important study limitation that could be overcome in future studies by recruiting subjects from a larger pool of general obstetrical clinic populations. Since we recruited subjects based on IPV status, nearly half of the sample has a lifetime history of IPV exposure and may reflect an over-representation of IPV exposure in perinatal populations in general, or among Latinas. Prevalence estimates of IPV exposure in non-perinatal Latino populations range from 19.5% to as high as 50% (Klevens 2007). Prevalence of exposure to IPV during pregnancy among Latinos is unknown but has been estimated to be as high as 20% in the general population (Gazmararian et al. 1996). Factors other than IPV that might explain the high rates of postpartum depression among Latinas have been identified from the few studies of the antecedents of postpartum depression among Latinas: low socioeconomic status, single parenthood, low social support, high acculturation, immigration status, and poor marital relationship quality (Kuo et al. 2004; Heilemann et al. 2003; Davilla et al. 2009; Diaz et al. 2007). However, none has specifically examined the role of IPV in postpartum depression. Thus, future research should examine IPV and these other psychosocial variables among Latinas drawn from a general obstetrical clinic population.

Our findings bring attention to an important yet under-studied psychosocial risk factor in perinatal health—partner violence during or within 12 months of pregnancy. These findings have implications for screening and intervention during pregnancy and suggest that routine prenatal IPV screening should be incorporated with depression screening. Screening for IPV and depression should be accompanied by appropriate referrals as needed, but IPV poses unique challenges for affected women. Women exposed to partner violence face multiple challenges to addressing mental health sequelae of IPV, resulting in substantial unmet mental health needs (Lipsky and Caetano 2007). Many of these challenges, such as partner coercion and limited IPV screening in clinical settings, are amplified for women from diverse populations because of cultural or linguistic barriers they may face (Rodriguez et al. 2009). Thus, preventive interventions for Latinas should be linguistically appropriate and culturally sensitive (Le et al. 2004, 2009).

There are several important limitations of this current study that could be addressed with larger and more diverse samples. We did not distinguish different types of violence and the consequences of psychological abuse during pregnancy that Tiwari et al. (2008) found in Hong Kong

should be examined in other populations. Because we used the recommended cut-point of four in the BDI-Fast Screen as our measure of depression, we did not assess depression severity, which may be an important consideration for understanding the clinical significance of the predictor variables for maternal mental health. Persistence of depression over the entire first year postpartum may be an important dimension to understanding the clinical severity and could distinguish other postpartum predictors for this population. However, there were too few women who met the cut-point for depression at each of the three observations ($n=14$). The BDI-Fast Screen was used to measure depression in this study and, while it does not provide confirmatory diagnosis of depression, is derived from the full Beck's Depression Inventory (the BDI-II), which has been found to have good specificity for depression in perinatal populations (Gaynes et al. 2005). Further research on the role of partner violence in postpartum depression should consider using a depression measure that has higher sensitivity for the condition over time. Co-occurring conditions may also increase the severity and persistence of depression, but the BDI-FS does not measure other clinical conditions. Future studies should consider a depression measure that incorporates other co-occurring conditions such as anxiety, e.g., the Edinburgh (Murray and Carothers 1990) or PHQ9 (Kroenke et al. 2001) to increase sensitivity. We did not identify causal pathways between violence and maternal depression and possible mediating effects of sociocultural variables because we did not have sufficient numbers of subjects and variability in the scores on some of the measures that would allow for causal modeling. Validation of these results in larger more diverse samples of Latinas as well as in non-Latina populations can improve the interpretation and applicability of these results regarding IPV as a prenatal predictor of postpartum depression.

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