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# Predictors of Posttraumatic Stress Disorder Symptoms Among Low-Income Latinas During Pregnancy and Postpartum

Lekeisha A. Sumner

University of California, Los Angeles, and Alliant International University

Lauren Wong, Christine Dunkel Schetter,  
Hector F. Myers, and Michael Rodriguez  
University of California, Los Angeles

This longitudinal study assessed the contributions of psychosocial factors to symptoms of posttraumatic stress disorder (PTSD) during pregnancy and at 7 and 13 months postpartum in a sample of 206 low-income Latinas receiving prenatal services. Bilingual interviewers administered semistructured interviews that assessed sociodemographic characteristics (income, age, marital status, acculturation) and psychosocial factors (intimate partner violence (IPV), other lifetime trauma, depressive symptoms, and social support). Hierarchical linear regression analyses were conducted at each of the 3 time points in pregnancy and postpartum to identify the best predictors of PTSD symptoms. Results revealed that low-income, depressive symptoms and a history of other lifetime trauma were associated with symptoms of PTSD during pregnancy. After controlling for PTSD symptoms at baseline, PTSD symptoms at 7 months postpartum were associated with depressive symptoms, low perceived social support, and IPV history, but not history of other trauma. After controlling for PTSD symptoms at 7 months postpartum, PTSD symptoms at 13 months were associated with depressive symptoms and IPV. Screening for depressive symptoms and noninterpersonal trauma history in early pregnancy and for depressive symptoms, IPV, and social support postpartum in low-income Latina women may aid in identifying those at heightened risk for mental distress.

*Keywords:* trauma, intimate partner violence, depression, PTSD, Latinas

Symptoms of posttraumatic stress disorder (PTSD) are widely reported during pregnancy and the postpartum time periods, with low-income ethnic women at particularly high risk (Loveland Cook et al., 2004). PTSD symptoms during pregnancy and postpartum periods are associated with adverse perinatal risk behaviors, psychiatric comorbidity, and other adverse maternal and neonatal outcomes (Morland et al., 2007; Seng, Low, Sperlich, Ronis, & Liberzon, 2009; Smith, Poschman, Cavaleri, Howell, & Yonkers, 2006; Sumner et al., 2010; Yehuda et al., 2005). Despite

such compelling empirical evidence, few studies have examined the psychosocial factors that contribute to risk for PTSD symptoms during these time periods. Even fewer studies have addressed psychosocial risks for PTSD symptoms in pregnancies of ethnic women, including low-income, immigrant Latinas who may be especially vulnerable to developing PTSD symptoms because of heightened risk for exposure to violence and some chronic stressors in comparison with other groups (Pole, Best, Metzler, & Marmar, 2005). Thus, increased empirical attention to determining the psychosocial factors that contribute to symptoms of PTSD in women at increased risk for mental distress has been emphasized (Morland et al., 2007; Rodriguez, Heilemann, Ang, Nevarez, & Mangione, 2008). To address this gap in the literature, the present study investigated psychosocial factors that have been associated with enhanced risk for symptoms of PTSD during pregnancy and at two time points postpartum among low-income Latinas.

Latinos compose a growing segment of the U.S. population (Ortega, Rosenheck, Alegria, & Desai, 2000). Latinos constitute approximately 13% of the U.S. population, have higher parity rates in relation to other ethnic groups in the U.S., and are more likely to live in poverty than are Whites (Ramirez & de la Cruz, 2002). In 2007, Latinos accounted for slightly more than one million of the roughly 4.3 million births in the United States, with women of Mexican descent accounting for the majority of Latina births (Hamilton, Martin, & Ventura, 2007). Moreover, 40% of Latinas are foreign-born and as noted previously, Latino ethnicity may be associated with increased risk of PTSD symptoms (Galea et al., 2002). Although the psychosocial predictors of PTSD among Latinas during pregnancy and postpartum are largely unknown, one cross-sectional study of U.S. and foreign-born low-income,

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Lekeisha A. Sumner, David Geffen School of Medicine, Department of Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, and Department of Psychology, Alliant International University, Los Angeles, California; Lauren H. Wong, Christine Dunkel Schetter, and Hector F. Myers, Department of Psychology, University of California, Los Angeles, California; and Michael Rodriguez, Department of Family Medicine, University of California, Los Angeles, California.

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Correspondence concerning this article should be addressed to Lekeisha A. Sumner, Department of Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, 760 Westwood Plaza, Los Angeles, CA 90095. E-mail: LSumner@UCLA.edu; LSumner@Alliant.edu

pregnant Latinas found that those exposed to intimate partner violence (IPV) and who also had a history of other trauma exposure evidenced greater risk for PTSD than did those without either of these trauma experiences (Rodriguez et al., 2008). Fluctuations in PTSD symptoms during the pregnancy and postpartum periods have been documented (Onoye, Goebert, Morland, Matsu, & Wright, 2009), but identifying the sociodemographic and psychosocial predictors of these symptoms during pregnancy and postpartum has not been done.

### PTSD Symptoms and Psychosocial Risks

Lifetime exposure to traumatic events is a fairly common occurrence and can precipitate symptoms of PTSD. In a representative national sample of adult women, Resnick, Kilpatrick, Dansky, Saunders, and Best (1993) reported that 36% reported lifetime exposure to violence (e.g., sexual and physical assault, homicide) perpetrated by someone they knew, and those who experienced crimes committed by known perpetrators had higher rates of PTSD (25.8%) than did those exposed to noncrime traumatic events (9.4%). Although it is important to note that only a small percentage (12.3%) of trauma-exposed individuals developed severe psychopathology subsequent to those events, these findings illustrate the need to consider not only diagnostic criteria of PTSD but also subclinical symptoms of PTSD following exposure to interpersonal trauma.

Given the increased need for community services for women exposed to interpersonal violence (Eisenman et al., 2009), pregnancy and postpartum appear to be especially important periods to address the effects of IPV (Kendall-Tackett, 2007). Among Latinas, the prevalence of IPV exposure during pregnancy is estimated to be 6.2% in comparison with 5.2% among pregnant women overall (Campbell, Torres, & Ryan, 1999; Yost, Bloom, McIntire, & Leveno, 2005). Women with histories of childhood trauma are also at greater risk for IPV exposure during adulthood, both overall and during pregnancy (Davidson, Hughes, Blazer, & George, 1991; Heise & Garcia-Moreno, 2002; Kessler & MaGee, 1993; Sumner, Myers, Carmona, Loeb, & Wyatt, 2009). Not surprisingly, substantial evidence confirms that negative reactions to trauma, depressive symptoms, and low perceived social support also contribute to PTSD risk, especially among women victims of violence (Andrews, Brewin & Rose, 2003; Coker et al., 2002; Zoellner, Foa & Brigidi, 2004). Taken together, this evidence indicates that early trauma confers risk for IPV during pregnancy, which in turn enhances vulnerability to depression and PTSD during pregnancy (Orr & Miller, 1995).

Two theoretical models provide useful concepts for examining predictors of PTSD symptoms among both foreign-born and U.S.-born individuals, especially those from low socioeconomic backgrounds. The Vulnerable Population Conceptual Model (VPCM) posits that because some individuals or groups (i.e., those with low incomes, some ethnic groups, and immigrants) have limited psychosocial and material resource availability, they have increased risks emanating from added life burdens, resulting in a heightened susceptibility for decreased health and well-being (Flaskerud & Winslow, 1998). For example, because of limited life chances associated with low incomes and education, they may be more likely to live in communities with increased violence, thereby increasing their exposure to traumatic events and the development

of PTSD symptoms. Unique to this model is that sociodemographic factors are postulated to directly influence health and well-being. Likewise, Myers (2009) described a life-span meta-model that proposed that cumulative risks across the life span contribute to increased exposure to adverse circumstances, chronic stress, and vulnerability and ultimately to poor health. Similar to the VPCM, this model also asserts that risk and protections conferred by ethnic-specific, socioeconomic, and psychosocial factors on health may differ across populations. This notion has been illustrated by findings that receipt of social support has been a potent independent predictor of positive mental health among Latinas, but not necessarily other populations (Campos et al., 2008; Sagrestano, Feldman, Rini, Woo, & Dunkel-Schetter, 1999; Taylor, Welch, Kim, & Sherman, 2007).

Therefore, the central objective of the current study was to assess the contributions of lifetime IPV exposure and other trauma exposure, depressive symptoms, and perceived levels of social support as risk factors for PTSD symptoms during pregnancy, and at 7 and 13 months postpartum in a sample of low-income, mainly immigrant Latinas. Specifically, and consistent with evidence to date (Galea et al., 2002; Resnick et al., 1993; Zoellner et al., 2004), it was hypothesized that (1) more severe symptoms of depression, IPV exposure, greater other trauma exposure, and lower levels of perceived social support would predict more severe PTSD symptoms during pregnancy and postpartum time points. We also hypothesized, consistent with previous evidence (Coker et al., 2002), that (2) social support would moderate the relationships between trauma exposure and severity of PTSD symptoms, controlling for co-occurring depression in this sample.

### Method

These hypotheses were investigated with data from Proyecto CUNA, a longitudinal study initiated in 2003 that followed a clinic sample of 210 pregnant IPV positive and negative Latina women, who were at least 12 weeks pregnant when they were enrolled in the study. The primary objective of Proyecto CUNA was to examine the effects of IPV exposure on a range of maternal and child health and behavioral outcomes both during pregnancy and for up to 5 years postpartum. For the current study, participants completed face-to-face semistructured interviews during the prenatal period and at 7 and 13 months postpartum. Full details of the study recruitment procedures and methodology are published elsewhere (Rodriguez et al., 2008). Briefly, eligibility criteria included being at least age 18, at least 12 weeks pregnant, English or Spanish speaking, and receiving obstetric services from a private medical center and an HMO health clinic in the greater Los Angeles area.

### Sample

Institutional Review Board (IRB) approval was obtained at both sites as well as from the University of California, Los Angeles (UCLA). All women attending obstetrics clinics that served Latina populations between January 2003 and January 2004 were consecutively approached by bilingual-bicultural Latina research staff and informed about the study while waiting for routine appointments. All participants were compensated \$20 for the baseline interview and \$40 for each follow-up interview.

A total of 210 women were enrolled into the study at baseline; 194 were present at Time 2 (7 months postpregnancy) and 190 at Time 3 (13 months postpregnancy). The majority of participants were recruited from the private medical center (61%;  $n = 128$ ) and the remainder from the HMO (39%;  $n = 82$ ). More participants were foreign born (76.2%), with most born in Mexico (53.4%), and the majority of interviews were conducted in Spanish (61.7%). Participants were on average 27.7 years old ( $SD = 5.8$  years), with 89.1% married and 10.9% single, divorced, or widowed. Approximately 58% of the women were unemployed, 46% had not graduated from high school, and 59% earned \$20,000 or less per year. Parity ranged from 0 to 10 children; the average number of children was 2, and 21% of the women were nulliparous.

## Measures

**Predictor variables.** Sociodemographic variables assessed during pregnancy included age, employment, marital/partner status, birthplace (foreign/U.S. born), length of time in the United States, parity, years of education, income level, and language of interview (English or Spanish).

Lifetime IPV exposure trauma status was ascertained during pregnancy using questions from the four-question Abuse Assessment Screen (AAS) (Soeken, McFarlane, Parker, & Lominack, 1998). Questions inquired about psychological, physical, and sexual abuse and a positive response to any of the abuse questions qualified a woman as being IPV positive. The AAS is a clinical screen for physical and sexual abuse within the last 12 months and was developed for both pregnant and nonpregnant women. Criterion-related validity was established and reliability was established at 97.5% using a test–retest method. On the basis of prior qualitative work, we modified this measure to include psychological experiences of being made to feel fearful for their safety. Women with positive responses to any one of the items were classified as IPV exposure. IPV was assessed during pregnancy and at each follow-up.

Other trauma (exposure to non-IPV physical, emotional, or sexual traumatic events) was measured with a 7-item index that assessed childhood experience of emotional or physical abuse by a parent or family member. These include four items from the Adverse Childhood Experiences Survey (ACE; Felitti et al., 1998), and three items from the Trauma History Questionnaire (THQ; Green, 1996) that identified sexual abuse from someone other than an intimate partner, witnessing household violence prior to age 18, and parental loss/separation prior to age 18. Positive responses to each item were summed, and scores ranged from 0 to 7, with higher scores reflecting higher exposure to early trauma.

Perceived social support was measured during pregnancy with the five-item Modified Medical Outcomes Study Social Support Survey (MSSS) (Sherbourne & Stewart, 1991) that included several types of support perceived as available, such as tangible (e.g., receiving transportation favors) and emotional (e.g., having someone to talk to) from either formal or informal sources. Scores range from 11 to 45, with high scores indicating high social support. Social support was assessed during pregnancy and at each follow-up. For this sample, reliability was good and ranged from an alpha of .87 to .93.

Depressive symptoms were measured during pregnancy with the seven-item Beck Depression Inventory Fast Screen (BDI-FS)

(Beck, Steer, & Brown, 2000) for Medical Patients. The BDI-FS is based on seven items from the BDI-II, which was developed to screen for depression in medical settings. Items are rated on a 4-point scale from 0 to 3 and total scores range from 0 to 19, with scores 10–21 suggestive of severe depression; 7–9 moderate; 4–6 mild; and 0–3 minimal or no depression. Depressive symptoms were assessed at all three time points. Reliability of the BDI-FS for this sample was high, ranging from an alpha of .85 to .86.

**Outcome variable.** Posttraumatic stress disorder symptoms were assessed at each time point with the 17-item PTSD Checklist—Civilian Version (PCL-C) (Housekamp & Goy, 1991), which measures the degree of severity of symptoms experienced in the last month, as outlined by the three PTSD symptom clusters in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR*; American Psychiatric Association, 2000). Participants were asked to describe their experiences in questions such as, “How much have you been bothered by repeated, disturbing memories, thoughts, or images of a stressful experience?” Women responded to questions using a 5-point scale ranging from 1 (*not at all*) to 5 (*extremely*) for each item. Total scores range from 17 (no symptoms) to 85 (indicating more PTSD symptoms). A total score of 50 or higher is associated with a probable diagnosis of PTSD. The PCL-C was assessed during pregnancy and at each follow-up. Scale reliability for the current sample was high at all time points with an alpha ranging from .95 to .96.

## Results

All analyses were conducted using SPSS version 17. Table 1 shows the sample means, standard deviations, and alpha coefficients for the key variables measured in the study. Given a range of 17 to 85, women reported an average of 23.03 PTSD symptom scores across all three time points. Scores on depressive symptoms ranged from 0 to 19 and had an average of 2.13. Over two thirds of participants (67.5%) had experienced other trauma exposure (e.g., childhood trauma before age 17), and a third reported no lifetime experience of trauma (32.5%). Over the course of the study, the percentage of women who experienced lifetime IPV exposure increased from 44% to 48%, demonstrating that some women experienced IPV exposure for the first time during pregnancy and in the months after giving birth. Table 1 also reports amount of perceived social support that women received from individuals in their social network. Scores were relatively high across all time points, with an average of 36.74 from a range of 11 to 48.

The bivariate relationship between PTSD and the key variables was examined through  $t$  tests and a bivariate correlation matrix (see Table 2). Correlation for PTSD symptoms among the three time points was moderate, ranging from  $r = .34$  to  $.39$ . All of the key variables were moderately correlated in the predicted directions with PTSD symptoms at all three time points, with depressive symptoms slightly more strongly correlated. Variables that were significantly correlated with the outcome were entered as independent variables in the hierarchical linear regression model to examine their relationship with severity of PTSD symptoms.

A hierarchical linear regression was used to test the relationship between the predictor variables and severity of PTSD symptoms during pregnancy, and at 7 months and 13 months postpartum.

Table 1  
*Sample Means, Standard Deviations (SD), and Alpha Coefficients for Key Variables*

Variable	Mean (SD)	Actual range	Alpha	N
PTSD symptoms:				
Time 1	25.34 (13.58)	17 to 85	.96	206
Time 2	21.33 (8.87)	17 to 68	.95	194
Time 3	22.43 (9.65)	17 to 85	.95	193
Depressive symptoms:				
Time 1	2.36 (3.72)	0 to 17	.85	194
Time 2	2.05 (3.45)	0 to 16	.86	194
Time 3	1.97 (3.44)	0 to 19	.86	193
Trauma history: Time 1	1.79 (1.90)	0 to 8	.73	206
Lifetime IPV: Time 1				
Yes	92 (44%)			210
No	118 (56%)			
Lifetime and current IPV: Time 2				
Yes	89 (45.9%)			194
No	105 (54.1%)			
Lifetime and current IPV: Time 3				
Yes	91 (47.9%)			190
No	99 (52.1%)			
Perceived support				
Time 1	37.22 (7.26)	11 to 45	.87	209
Time 2	36.57 (7.86)	11 to 48	.90	191
Time 3	36.42 (8.32)	11 to 45	.93	190

Note. PTSD = posttraumatic stress disorder; IPV = intimate partner violence.

Table 3 shows the hierarchical regression model in which demographic variables were entered in the first step, scores on depressive and previous PTSD symptoms were entered at the second step, and psychosocial predictors such as non-IPV-specific trauma history, lifetime IPV exposure, and perceived social support were entered in the third and final step.

**During Pregnancy.** During pregnancy, and after controlling for marital status, income, and depressive symptoms, greater childhood trauma exposure ( $\beta = .24, p < .01$ ) was associated with current PTSD symptoms. More severe depressive symptoms were associated with PTSD symptoms ( $\beta = .60, p < .05$ ). In addition, lower income was significantly associated with PTSD symptoms ( $\beta = -.14, p < .05$ ), such that women who made \$20,000 or less per year had higher PTSD scores ( $M = 1.6, SD = .88$ ) than did those who made over \$20,000 per year ( $M = 1.3, SD = .59$ ). This model

explained 45% of the variance in predicting PTSD symptoms during pregnancy.

**7 months postpartum.** At 7 months postpartum (Time 2), and as expected, lifetime and recent IPV exposure and levels of perceived social support were significantly associated with severity of PTSD symptoms, after accounting for concurrent depressive and PTSD symptoms during pregnancy (see Table 4). Also, women who reported recent or lifetime IPV ( $M = 1.4, SD = .64$ ;  $M = 1.1, SD = .31$ ;  $\beta = .15, p < .05$ ), more concurrent depressive symptoms ( $\beta = .37, p < .01$ ), and lower levels of perceived social support ( $\beta = -.17, p < .05$ ) were more likely to have more severe PTSD symptoms. This model explained 33% of the variance in predicting PTSD symptoms at 7 months postpartum.

**13 months postpartum.** Results presented in Table 5 indicate that at 13 months postpartum (Time 3), and after controlling for

Table 2  
*Bivariate Correlations of All Relevant Variables*

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Age	—										
2. Acculturation	-.241**	—									
3. PTSD Sxs: T1	.010	.007	—								
4. PTSD Sxs: T2	-.033	.087	.345**	—							
5. PTSD Sxs: T3	-.142*	.194*	.340**	.394**	—						
6. Depressive Sxs: T1	-.003	.034	.666**	.376**	.348**	—					
7. Depressive Sxs: T2	-.070	.278**	.395**	.493**	.410**	.439**	—				
8. Depressive Sxs: T3	-.037	.109	.469**	.388**	.561**	.556**	.640**	—			
9. Trauma Hx	.162*	.101	.300**	.189*	.137	.377**	.168*	.138	—		
10. Support: T1	-.094	.105	-.376**	-.299**	-.210**	-.563**	-.266**	-.496**	-.280**	—	
11. Support: T2	-.108	.054	-.271**	-.409**	-.178**	-.442**	-.425**	-.487**	-.209**	.661**	—
12. Support: T3	-.020	.032	.343**	-.244**	-.275**	-.483	-.470**	-.546**	-.148**	.653*	.736**

Note. PTSD = posttraumatic stress disorder; Sxs = symptoms (i.e. depressive); Hx = history (i.e. Trauma history); T1, T2, T3 = Time 1, 2, or 3.  
 \*  $p < 0.05$ . \*\*  $p < .01$  (two-tailed).

Table 3  
Summary of Hierarchical Regression Analysis for Variables Predicting PTSD Symptoms at Time 1 (N = 166)

Variable	Initial step entered		Final step	
	B (SE)	β	B (SE)	β
Step 1				
Marital status	-2.75 (3.32)	-.07	2.42 (2.59)	.06
Income	-4.63 (2.09)	-.17*	-3.61 (1.65)	-.14*
Step 2				
Depressive symptoms: T1	2.17 (.21)	.62**	2.09 (.26)	.60**
Step 3				
Trauma history: T1	1.69 (.44)	.24**	1.69 (.44)	.24**
Lifetime IPV: T1	.53 (1.69)	.02	.53 (1.69)	.02
Perceived support: T1	.15 (.13)	.08	.15 (.13)	.08

Note.  $R^2 = .04$  for Step 1 ( $ps < .05$ );  $\Delta R^2 = .38$  ( $ps < .001$ ) for Step 2;  $\Delta R^2 = .06$  ( $ps < .01$ ) for Step 3. PTSD = posttraumatic stress disorder; SE = standard error; IPV = intimate partner violence; T1, T2, T3 = Time 1, 2, or 3.  
\*  $p < 0.05$ . \*\*  $p < .01$  (two-tailed tests).

length of time in the U.S., severity of concurrent depressive symptoms, and severity of PTSD symptoms at 7 months postpartum, lifetime histories of IPV exposure were significantly associated with PTSD symptoms ( $\beta = .15, p < .05$ ). After accounting for age, women who had reported lifetime histories of IPV exposure ( $M = 1.5, SD = .68$ ) had higher PTSD symptoms scores than did those who had not ( $M = 1.1, SD = .35$ ), and those with more severe depressive symptoms at 13 months postpartum were also significantly more likely to evidence more severe PTSD symptoms ( $\beta = .60, p < .01$ ). This model explained 56% of the variance in predicting PTSD symptoms at 13 months postpartum.

In summary, results indicated that overall, PTSD symptoms in this sample were in the mild range at all time points. The results also identified slightly different patterns of associations between predictors of severity of PTSD symptoms at each measurement point, with a lifetime history of IPV exposure and concurrent depression being the most consistent risk factors. For example, during pregnancy, greater other childhood trauma exposure, more severe depressive symptoms, and lower income were the strongest predictors of severity of PTSD symptoms. At 7 months postpartum, a lifetime history of IPV exposure, more severe concurrent

depressive symptoms, and lower levels of perceived social support were the strongest predictors. Finally, at 13 months postpartum, a lifetime history of IPV exposure and severity of concurrent depressive symptoms were associated with more severe PTSD symptoms. Finally, contrary to expectations, perceived social support did not moderate the relationship between other trauma exposure and severity of PTSD symptoms.

These multivariate models were robust and accounted for a substantial amount of the variance over time in this sample of low-income, low-acculturated Latina women: 45% during pregnancy, 33% at 7 months postpartum, and 56% at 13 months postpartum.

### Discussion

Maternal psychological distress has been implicated as having direct and indirect effects on both maternal and child health. In this sample of uniformly low-income pregnant Latinas, variations in income were still significantly and negatively associated with PTSD symptoms during pregnancy. This finding is consistent with prior results and theory suggesting that poverty directly contributes to risk of PTSD symptoms and may have a gradient effect

Table 4  
Summary of Hierarchical Regression Analysis for Variables Predicting PTSD Symptoms at Time 2 (N = 184)

Variable	Initial step entered		Final step	
	B (SE)	β	B (SE)	β
Step 1				
PTSD symptoms: T1	.09 (.04)	.15*	.08 (.04)	.12 <sup>†</sup>
Depressive symptoms: T2	1.18 (.17)	.48**	.92 (.18)	.37**
Step 2				
Trauma history: T1	-.22 (.31)	-.05	-.22 (.31)	-.05
Lifetime IPV: T2	2.51 (1.17)	.15*	2.51 (1.17)	.15*
Perceived support: T2	-.19 (.08)	-.17*	-.19 (.08)	-.17*

Note.  $R^2 = .31$  for Step 1 ( $ps < .001$ );  $\Delta R^2 = .04$  for Step 2 ( $ps < .05$ ). PTSD = posttraumatic stress disorder; SE = standard error; IPV = intimate partner violence; T1, T2, T3 = Time 1, 2, or 3.  
<sup>†</sup>  $p < .10$ . \*  $p < 0.05$ . \*\*  $p < .01$  (two-tailed tests).

Table 5  
 Summary of Hierarchical Regression Analysis for Variables Predicting PTSD Symptoms at Time 3 ( $N = 99$ )

Variable	Initial step entered		Final step	
	B (SE)	$\beta$	B (SE)	$\beta$
Step 1				
Age	-.23 (.21)	-.11	-.17 (.15)	-.08
Acculturation	.43 (.23)	.19 <sup>†</sup>	.14 (.17)	.06
Step 2				
PTSD symptoms: T2	.32 (.10)	.23**	.30 (.10)	.22**
Depressive symptoms: T3	2.43 (.28)	.62**	2.34 (.33)	.60**
Step 3				
Trauma history: T1	-.49 (.52)	-.07	-.49 (.52)	-.07
Lifetime and recent IPV: T3	3.48 (1.74)	.15*	3.48 (1.74)	.15*
Perceived support: T3	.01 (.12)	.01	.01 (.12)	.01

Note.  $R^2 = .06$  for Step 1 ( $ps < .10$ );  $\Delta R^2 = .52$  ( $ps < .001$ ) for Step 2;  $\Delta R^2 = .01$  for Step 3. PTSD = posttraumatic stress disorder; SE = standard error; IPV = intimate partner violence; T1, T2, T3 = Time 1, 2, or 3.

<sup>†</sup>  $p < .10$ . \*  $p < 0.05$ . \*\*  $p < .01$  (two-tailed tests).

(Flaskerud & Winslow, 1998; Seng et al., 2009). However, in this sample the effects of income on PTSD symptoms diminished by the two postpartum follow-up time points. In turn, other factors such as interpersonal conflict, violence, and depressive symptoms became more important contributors to PTSD symptom severity over time.

As expected, depressive symptoms significantly predicted PTSD symptoms at each time point, but other factors, such as levels of perceived social support, lifetime IPV exposure, and other trauma history, made significant contributions as well. Although depressive and PTSD symptoms were significantly correlated at each time point, these correlations were attenuated somewhat after birth. Finally, after controlling for prior PTSD symptoms, depressive symptoms were still predictive of PTSD symptoms at all time points, which suggests that changes in PTSD are a function in part of ongoing depressed state. That is, increases in depressive symptoms contribute to PTSD symptoms over time. Increases or decreases in PTSD symptoms from pregnancy to postpartum were contributed to by higher or lower depressive symptoms.

Similar to a previous cross-sectional study using this cohort (Rodriguez et al., 2008), a history of noninterpersonal early life trauma was significantly associated with PTSD symptoms during pregnancy in this study. However, in the previous report, no evidence emerged that lifetime IPV exposure or lower levels of perceived social support contributed to PTSD symptoms during pregnancy. There are several plausible explanations for the emergence of additional findings in this study. First, there were some differences in the assessment of variables in these two sets of analyses. In this study, we operationalized lifetime IPV as a positive response to any experience of psychological, physical, and sexual abuse, whereas in the Rodriguez et al. (2008) study, IPV was examined separately as lifetime exposure and exposure in the previous 12 months. Second, in the earlier study, limited variance in some scores may have resulted in a ceiling effect such that insufficient variability in reported IPV and social support reduced the power of some tests.

Participants in the present study were recruited to ensure a final sample of approximately half with exposure to IPV (44% reported lifetime IPV at baseline). These rates are high but within the range reported in one other study of U.S. and foreign-born Latinas in which lifetime IPV exposure was from 21% to 84% (Hazen & Soriano, 2007). Given that high rates of revictimization among individuals with histories of lifetime trauma (especially childhood trauma) are well documented (Wyatt et al., 2002), it is not surprising that almost two thirds of the women in this study who were recruited for IPV exposure also reported histories of exposure to trauma in childhood. Additionally, a slight increase in the number of women who experienced such violence was observed over time in this study (from 44% to 47.9%). This finding is consistent with observations that pregnancy is a period of vulnerability to interpersonal violence (Amaro, Fried, Cabral, & Zuckerman, 1990; Castro et al., 2003). These findings affirm the need to consistently screen for IPV exposure over time, including during pregnancy and postdelivery follow-up visits in women at high risk for abuse.

A key finding of this study was that lifetime and recent IPV exposure were significantly associated with PTSD symptoms at 7 and 13 months postpartum. More specifically, after controlling for PTSD symptoms during pregnancy, residual PTSD symptoms at 7 and 13 months postpartum were found to be a function of greater lifetime history of IPV exposure as well as greater postpartum depressive symptoms, and at the 7-month time point with lower levels of postpartum perceived social support. However, lifetime non-IPV trauma history was unrelated to PTSD risk at either postpartum time point. These results suggest that risk for IPV extends beyond pregnancy, and its effects are exacerbated by co-occurring depression, as well as by lower social support even more than a year later in Latinas in these conflictual relationships. These results also suggest that history of other noninterpersonal trauma appears to serve as an independent risk factor for PTSD during early pregnancy, but its effects become attenuated over time, and recent experiences of interpersonal violence and co-occurring depression become better predictors of risk for PTSD.

The finding that level of perceived social support was an independent predictor of PTSD symptoms only at the 7-month postpartum period may suggest that prenatal social support is more influential in well being in early postpartum and in changes in PTSD symptoms from pregnancy to postpartum. Additional analyses (not shown) were conducted to test for perceived social support as a moderator of the relationship between trauma exposure and PTSD symptoms at each time point, but none were significant. Consistent with previous studies on Latinas during pregnancy and postpartum, women in the current study reported high levels of perceived social support at all time points, resulting in limited variance, which may have limited the power of tests of social support in this study.

It merits mentioning that the present sample included mainly low-income and low-acculturated Latinas from Mexico. Therefore our findings may not generalize to women of other Latina ethnic subgroups, languages, and socioeconomic backgrounds. Therefore, additional studies are needed to test whether these findings will replicate with Latinas from other subgroups (e.g., Cubans, Puerto Rican, etc.; Alegría et al., 2008).

Despite these interpretative cautions, the findings in this study benefit from several methodological strengths, including a prospective and longitudinal design, psychometrically sound measures administered in English and Spanish, and a difficult-to-reach and retain population.

The results from the present analysis may open up new lines of inquiry and provide guidance to clinical care. Because PTSD and depressive symptoms had independent effects, they should be assessed separately in future studies where possible and certainly during pregnancy. In order to develop and test culturally tailored interventions, future research should examine the mechanisms that may underlie the development of depressive and PTSD symptoms. Such studies should include assessment of culture-specific factors, such as sociocultural risks (e.g., ethnic discrimination) and socioeconomic status-related exposures (e.g., chronic stress), as well as protective factors (e.g., familism, social support, and spirituality) (Campos et al., 2008; Rini, Dunkel-Schetter, Wadhwa, & Sanman, 1999). All of these may make independent contributions to the expression and development of symptoms of emotional distress among Latinas and other populations of color (Myers, 2009).

In conclusion, increased empirical focus on symptoms of PTSD and associated psychosocial predictors are important in order to more fully contextualize the risks of mental distress during pregnancy and postpartum.

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