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Correlates of Perinatal Posttraumatic Stress among Culturally Diverse Women with Depressive Symptomatology

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Abstract

Posttraumatic Stress Disorder (PTSD) is an important and often neglected comorbidity of pregnancy; left untreated can lead to serious health complications for the mother and developing fetus. Structured interviews were conducted to identify risk factors of PTSD among culturally diverse women with depressive symptomatology receiving perinatal services at community obstetric/gynecologic clinics. Women abused as adults, with two or more instances of trauma, greater trauma severity, insomnia, and low social support were more likely to present perinatal PTSD symptoms. Perinatal PTSD is prevalent and has the potential for chronicity. It is imperative healthcare providers recognize salient risk factors and integrate culturally sensitive screening, appropriate referral, and treatment services for perinatal PTSD.

Keywords

health disparities; PTSD; postpartum depression; intimate partner violence; mental health

Introduction and Background

Posttraumatic Stress Disorder (PTSD) is an important and often neglected comorbidity of pregnancy. Approximately 1.5 million women in the United States experience PTSD, with

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Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

Data Sharing Policy

Intellectual property and data generated under this project will be administered in accordance with both University of San Diego and NIH policies, including the NIH Data Sharing Policy and Implementation Guidance of March 5, 2003. Research data that documents, supports, and validates research findings will be made available after the main findings from the final research data set have been accepted for publication. Such research data will be redacted to prevent the disclosure of personal identifiers.

the prevalence among pregnant women estimated at 7.7% to 9% and among postpartum women at 3.6 to 30%; it is further estimated that 18% of pregnant women are at risk for the development of PTSD (Alcorn, O'Donovan, Patrick, Creedy, & Devilly, 2010; Beck, Gable, Sakala, & Declercq, 2011; Grekin & O'Hara, 2014; Muzik et al., 2016). PTSD disrupts a woman's ability to function in a healthy capacity with regard to daily activities related to family, work, and school (Seng, Low, Sperlich, Ronis, & Liberzon, 2009) and increases the risk for traumatic pregnancies and births including distress during the process of delivering a baby, prematurity/low birth weight, decreased maternal child bonding, poor prenatal care, risky behaviors during pregnancy (e.g., alcohol and drug use), excessive weight gain, lack of breastfeeding postpartum, and childhood psychological impairments (Fan et al., 2014; Morland et al., 2007; Rogal et al., 2007; Seng et al., 2009; Seng, Low, Sperlich, Ronis, & Liberzon, 2011; Weinreb, 2012).

The National Comorbidity Survey conducted in 1995 found comorbid depression and PTSD is common; notably, 24.7% of depressed women have PTSD, and 48.4% of women with PTSD also suffer depression (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). More recent research has linked PTSD with depression and anxiety disorders during the perinatal period (Cerulli, Talbot, Tang, & Chaudron, 2011; Smith, Poschman, Cavaleri, Howell, & Yonkers, 2006). Perinatal depression and perinatal PTSD are thought to occur simultaneously due to similar physiologic mechanisms in both the hypothalamic-pituitary-adrenal (HPA) and hypothalamic-pituitary-ovarian (HPO) axis and may share the same risk factors (Seng et al., 2010; Stone & Menken, 2008). Extant research has identified factors that increase the risk for perinatal PTSD, but has largely focused on risk factors related to postpartum PTSD with limited attention to PTSD across the perinatal period. Given that perinatal PTSD may disproportionately affect highly vulnerable women (e.g., low income, minority, or single mothers) understanding the factors related to the development of perinatal PTSD is critically needed to improve identification and timely treatment.

Perinatal PTSD Risk Factors

The prevalence of intimate partner violence (IPV) during pregnancy is estimated to be 5.3 to 8.7% around the time of birth, frequently escalates during pregnancy, and may result in serious consequences, including death to both the mother and the unborn child (Bailey, 2010; Bianchi, McFarlane, Cesario, Symes, & Maddoux, 2016; Chisholm, Bullock, & Ferguson II, 2017; Saltzman, Johnson, Gilbert, & Goodwin, 2003). Depression and PTSD have been identified as common sequelae of IPV with approximately 40% of abused women reporting depressive symptomatology (Connelly, Hazen, Baker-Ericzen, Landsverk, & Horwitz, 2013; Plichta, 2004; P. S. Shah, J. Shah, & Knowledge Synthesis Group on Determinants of Preterm/LBW Births, 2010) with PTSD rates ranging from 19 to 84% (Hellmuth, Jaquier, Swan, & Sullivan, 2014; Huth-Bocks, Krause, Ahlfs-Dunn, Gallagher, & Scott, 2013; Woods, Hall, Campbell, & Angott, 2008). Data also show there are associations between perinatal IPV and poor maternal health behaviors, such as greater use of alcohol, tobacco, and other drugs (ATOD), a lower likelihood of ceasing substance use during pregnancy, and delay in prenatal care (Gold, Singh, Marcus, & Palladino, 2012; Holden, McKenzie, Pruitt, Aaron, & Hall, 2012; Substance Abuse and Mental Health Services Administration [SAMHSA] 2015). Sleep disturbance is a common complication of

pregnancy and postpartum with linkages to perinatal mental health (Manber et al., 2013; Seng et al., 2010). Severity of depression was found to be a significant indicator of insomnia among English speaking Latinas (versus Spanish speaking) in a predominately low income Latina sample (Manber et al., 2013).

More specifically, insomnia, depression, and a history of abuse contribute to perinatal PTSD. DeViva and Capehart (2015) note insomnia, seen commonly as a comorbidity in the literature, may also worsen the effects of perinatal PTSD. Sumner, Wong, Schetter, Myers, and Rodríguez (2012) found perinatal depression, low social support, and IPV as being antecedents or risk factors for perinatal PTSD in low-income Latinas; Rodríguez et al., (2008) suggest depression and a previous history of abuse contribute to perinatal PTSD. Parental stress and a prior maternal history of abuse also contribute to perinatal PTSD (Andersen, Melvaer, Videbech, Lamont, & Joergensen, 2012; Choi & Sikkema, 2016; Dodgson, Oneha, & Choi, 2014; Suttora, Spinelli, & Monzani, 2014).

Trauma and Perinatal PTSD

PTSD is classified as a Trauma- and Stressor-Related Disorder (American Psychiatric Association [APA] 2013); perinatal depression is classified as a mood disorder. Previous perinatal studies indicate the following traumas contribute to PTSD: childhood sexual and/or physical abuse; IPV; combined exposure to abuse and witnessing abuse; traumatic birth, miscarriage or abortion; and perinatal procedures (Kulkarni, Graham-Bermann, Rauch, & Seng, 2011; Seng et al., 2009; Wenz-Gross, Weinreb, & Upshur, 2016). Mendez-Figueroa, Dahlke, Vrees, and Rouse (2013) systematic review indicates IPV and motor vehicle accidents are the most common traumas reported in pregnancy. Huth-Bocks et al. (2013) note the prevalence of traumas is higher in low income and culturally diverse populations. Indeed, utilizing data from a large perinatal sample participating in the NIH NR008767 STACY project, Seng, Kohn-Wood, McPherson, and Sperlich (2011) identified perinatal PTSD is four times higher in African-Americans due to higher rates of trauma exposure.

Perinatal PTSD is defined as a disorder occurring after a traumatic experience, diagnosed any time from conception to 6 months postpartum, lasting longer than 1 month, and leading to specific negative diagnostic maternal symptoms and poor maternal-infant outcomes (Vignato, Georges, Bush, & Connelly, 2017). A concept analysis indicated antecedents or risk factors include trauma (perinatal complications and abuse [child, IPV, sexual]), previous psychiatric history, and postpartum depression (Vignato et al., 2017). If left untreated, perinatal PTSD has the potential to increase healthcare costs and adverse health disparities from decreased maternal child bonding, prematurity/low birth weight, poor prenatal care, risky behaviors (e.g. alcohol and drug use), excessive weight gain, lack of breastfeeding postpartum, and childhood psychological impairments (Fan et al., 2014; Muzik et al., 2016; Rogal et al., 2007; Weinreb, 2012). Using established cutoffs for the Davidson Trauma Scale (DTS; Davidson et al., 1997) to indicate perinatal PTSD symptomatology, we examined factors that have been previously identified as associated with PTSD in the general population. Findings from this study can help in clarifying these relationships among underserved populations during the perinatal period to guide the development of early prevention/intervention strategies. Exploring correlates of perinatal PTSD in underserved,

culturally diverse women, this study has the potential to highlight the process by which multiple factors may influence degrees of risk and vulnerability; raising further questions about the nature of cumulative risk and its impact on perinatal mental health (Gill & Page, 2006).

Aim

The overall aim is to identify the risk factors in a sample of culturally diverse women with perinatal depressive symptomatology who have perinatal PTSD compared to those who do not.

Methods

This cross sectional study used data from the Perinatal Mental Health Project (RO1-MH075788); a randomized controlled trial designed to examine the effectiveness of a collaborative care model to improve the identification, referral, and treatment of perinatal depression in community obstetric clinics serving ethnically diverse, low income pregnant or postpartum women (Connelly et al., 2013). In the original research 1,868 women completed screening interviews (up to three times during pregnancy and once at the 6-weeks postpartum visit), with 462 (24.7%) screening positive for depressive symptoms on the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987). Women who screened positive for depressive symptoms (EPDS ≥ 10) were followed one year postpartum (Connelly et al., 2013). The data reported here were collected at study entry for 276 (14.8%) women who initially screened positive for depressive symptoms and completed the DTS assessment measuring perinatal PTSD (Figure 1).

Setting and Participants

Women receiving obstetrical services at routinely scheduled perinatal visits, including the 6-week postpartum visit were recruited and enrolled from 10 community obstetric/gynecologic health clinics serving greater San Diego, CA from March 2009 through January 2012. All procedures were approved by participating clinics and university institutional review boards. Complete discussion of sampling procedures is described elsewhere (Connelly, Baker-Ericzen, Hazen, Landsverk, & Horwitz, 2010; Connelly et al., 2013). Covariates included in this analysis were conceptually driven and included severity of depressive symptomatology, IPV, abuse as child, substance use, insomnia, social support, number of traumatic events, age, gravida, education, household income, race/ethnicity, partner status, primary language, and country of birth (Connelly et al., 2013; Muzik et al., 2016; Seng, D'Andrea, & Ford, 2014).

Measures

Standard demographic questions were used to assess participants' age, race, ethnicity, nativity status, primary language, marital status, partner status, education, and income. For analysis, race/ethnicity was grouped into four categories: Latina; Caucasian; Black, African-American; and other. Nativity status was grouped into two categories: born in the U.S., and born outside the U.S. Marital status was grouped into three categories: married, living together; separated, divorced, widowed; and never married, single. Current relationship

status was defined as having a partner (yes/no). Antenatal Medical Complications (number and type) and gravida (number of participants' pregnancies) was extracted from participants' medical chart. Gravida was grouped into one, two, three, and four or more.

Davidson Trauma Scale.—The DTS (Davidson et al., 1997) is a widely used 17-item self-report scale; each item corresponds to a *Diagnostic and Statistical Manual of Mental Disorders, Fourth edition* (DSM-IV; APA, 1994) symptom of PTSD. In this study the DTS was used to measure perinatal PTSD. The DTS takes approximately 10 minutes to complete, covers all types of trauma, and includes three symptom clusters in subscales of intrusive, avoidance/numbing, and hyper-arousal. Respondents are asked to identify the trauma that is most disturbing to them and to rate, in the past week, how much trouble they have had with each symptom (Davidson et al., 1997; Davidson, Tharwani, & Connor, 2002). The DTS has been widely tested with good internal consistency for both English and Spanish versions; Cronbach's alpha range from .97 to .99 for the total score (Leiva-Bianchi & Araneda, 2013). Cronbach's alpha for the total DTS score in the current study is .98. The DTS can be used to make a preliminary determination whether the symptoms meet DSM criteria for PTSD. Cut points have been reported from 20 to 44 (Davidson et al., 1997; McDonald, Beckham, Morey, & Calhoun, 2009); with higher sensitivity and diagnostic efficiency values at the 32 cut point when compared with a cut point of 40 (McDonald et al., 2009). In this study the cut point for positive perinatal PTSD symptoms was set at 32.

Edinburgh Postnatal Depression Scale.—The EPDS (Cox et al., 1987) is a 10-item self-report scale designed to assess depressive symptoms. The EPDS screens mood symptoms (not physical symptoms potentially affected by the perinatal period) for the last seven days. The EPDS has been extensively used and validated across multiple community, culturally, and ethnically diverse populations (Alvarado-Esquivel, Sifuentes-Álvarez, Salas-Martínez, & Martínez-García, 2006; Connelly et al., 2010; Eberhard-Gran, Eskild, Tambs, & Opjordsmoen, 2001; Mosack & Shore, 2006). Higher scores indicate greater depressive symptomatology. All women in this sample screened positive for depressive symptoms, with EPDS scores equal or greater than 10, and Cronbach's alpha of .85.

Trauma Events Questionnaire (TEQ).—The TEQ is a screening instrument that identifies 10 types of lifetime trauma experienced (e.g., natural disasters, serious accidents, sexual/physical abuse, or IPV; Crawford, Lang, & Lafalle, 2008). In the present study, the type of lifetime trauma experienced was grouped into three categories, (a) abused when child, (b) abused when adult, and (c) other traumatic event. The TEQ also produces trauma occurrence scores (No. of traumas experienced, No. of times the trauma occurred) and an intensity score. The intensity score is obtained by asking participants to rate on a Likert scale from 1 (*not at all*) to 7 (*severely*) the severity of the injury, the extent to which they felt their life was in danger, and how stressful the traumatic experience was then and currently. Scores range from 3 to 21, with higher scores representing greater trauma severity. The TEQ exhibits high reliability of .91 with a 2-week test-retest interval (Orsillo, 2001). Cronbach's alpha for the TEQ in the current study is .71.

Abuse Assessment Screen (AAS).—The AAS is a 5-item clinical screen recommended by the March of Dimes for assessment of abuse in the last 12 months; the frequency and type of physical, psychological, and sexual abuse with all pregnant women (Parker, McFarlane, & Soeken, 1994). The AAS possesses strong reliability and construct validity with the Conflict Tactics Scales and other measures of IPV (Soeken, McFarlane, Parker, & Lominack, 1998). Participants who indicated they had been physically or sexually abused by a current or former intimate partner in the last year or during their pregnancy were considered to have experienced IPV.

Insomnia Severity Index (ISI).—The ISI is a 7-item screen measuring the last 2 weeks of insomnia symptom severity, distress, and daytime impairment (Morin, Belleville, Belanger, & Ivers, 2011). Each item is rated from 0 to 4, with higher scores reflecting greater disturbance, and a total score is derived from the sum of the seven items. Validated versions are available with good internal consistency for both English and Spanish versions. Cronbach's alpha for the ISI in the current study is .92.

Tolerance, Worried, Eye-opener, Amnesia, and K/Cut down on consumption (TWEAK).—The TWEAK alcohol screening test (Russell & Bigler, 1979) is a short, five-question screen originally designed to screen pregnant women for harmful drinking habits (Russell et al., 1994). It is one of the few alcohol screening tests developed and validated among women. The maximum score is 7 points, with the first two questions counting for 2 points each and the last three questions, 1 point each. For example, if a woman responds "It takes three or more drinks to feel high," she scores 2 points. For the question, "Do you sometimes take a drink in the morning when you first get up?" If yes, she scores 1 point. A total score of two or more on the test is an indication of harmful drinking and further evaluation is indicated.

Short Drug Abuse Screening Test (DAST-10).—The DAST-10 is a 10-item screen identifying drug (excluding alcohol and tobacco) usage within the last 12 months (e.g. have you used drugs other than those required for medical reasons? Do you ever feel bad or guilty about your drug use?) Items assess drug use in general, without referring to specific types of drugs, responses are 1 (Yes) and 0 (No), with possible scores ranging from 0 to 10 (Bohn, Babor, & Kranzler, 1992). Scores of 1 to 2 indicate potential drug problems, with scores of 3 or higher indicating moderate to severe drug problems. The DAST-10 is internally consistent (Cronbach's alpha = .86) and temporally stable (interclass correlation coefficient = .71; Bohn et al., 1992). In the current study, scores of 3 or higher indicated positive drug abuse, and Cronbach alpha is .70.

Multidimensional Scale of Perceived Social Support (MSPSS).—The MSPSS assesses 12 items of social support using a 7-item Likert scale on the categories of friends, family, and significant other. The MSPSS is a standardized and a well validated measure for both English and Spanish versions (Cecil, Stanley, Carrion, & Swann, 1995; Wilcox, 2010; Zimet, Dahlem, Zimet, & Farley, 1988). Cronbach's alpha for MSPSS in the current study is .88.

Statistical Analyses

Of the 276 women in this study, 84 (30.4%) screened positive for perinatal PTSD symptoms. Descriptive statistics were calculated for all analysis variables and data were examined for normality, missing values, and outliers. Chi-square tests (or Fisher's Exact tests to help mitigate the impact of small response groups) were used with categorical variables to examine bivariate relationships between perinatal PTSD and participants' characteristics; t-test were used with continuous variables. Variables significant at $p < .01$ in the bivariate analysis were considered for entry into a logistic regression model to ascertain factors that increase the odds of perinatal PTSD among women with perinatal depressive symptoms. Variables at $p < .05$ suggested in the extant literature as potential important correlates of perinatal PTSD (e.g., race/ethnicity, partner status, gravida, or antenatal medical complications) were also considered for entry into the regression model.

Results

Sample Characteristics

Sociodemographic and clinical characteristics of the study population overall and by perinatal PTSD group are presented in Table 1 and Table 2. Among the 276 women who screened positive for depressive symptoms and completed the DTS assessment measuring perinatal PTSD, 76% ($n = 209$) were Latina, and 48% ($n = 133$) were born in the U.S. Women' ages ranged from 14 to 43 years, with a median age of 28 years ($SD = 6.21$); 167 (61%) had at least a High School education; 52 (19%) had a partner; and 191 (69.2%) reported an annual household income below \$30,000.

Women entered the study at different times during the perinatal period; with 59 (21.4%) enrolled in the first trimester, 93 (33.7%) in the second trimester, 77 (27.9%) in the third trimester, and 47 (17.0%) at the 6-week postpartum visit. Out of all the women who reported at least one traumatic event in their lifetime ($n = 276$), 84 (30.4%) presented symptoms of perinatal PTSD. Of the women who completed the DTS during the first trimester 32.2% (19/59) presented symptoms of perinatal PTSD, 32.3% (30/93) during the second trimester, 28.6% (22/77) during the third trimester, and 27.7% (13/47) at the 6-week postpartum visit indicating the necessity to screen for perinatal PTSD across the entire perinatal period.

Seventy-two women (28.4%) reported the most traumatic event they experienced was being abused as a child, 62 (22.5%) being abused as an adult (including physical, psychological, and sexual abuse), and 135 (49.1%) other type of traumatic event (e.g., witnessing a serious accident, experiencing a natural disaster, being the victim of a violent crime, or witnessing violence). For 118 women (43.5%), the most traumatic event occurred 3 or more times; with a mean intensity of 10.33 ($SD = 5.36$; actual range = 3 – 21). The current or recent IPV reported using the AAS was slightly lower (17%) to the rate of lifetime IPV reported using the TEQ (22.5%). Women also reported a mean depressive symptom severity score of 13.95 ($SD = 3.74$; actual range = 10 – 28); with 28% engaging in risky drinking behaviors, and 13% in problematic drug use. Approximately half (50.4%) had insomnia problems and reported a moderate level of social support ($M = 5.01$, $SD = 1.13$). Seventy-six (40.4%) had

been pregnant four or more times and had an average of 2 antenatal medical complications (actual range = 0 – 7) by the time they entered the study.

Correlates of Perinatal PTSD

The results of the bivariate analyses comparing the demographic and clinical characteristics of women with and without perinatal PTSD symptoms are reported in Table 1. All women in the sample presented depression symptoms and had experienced at least one episode of trauma in their life at study entry. Chi-square tests of independence found significant associations between perinatal PTSD and race, $\chi^2(3) = 10.20, p = .017$; partner status, Fisher's $\chi^2(1) = 4.27, p = .045$; type of MTE experienced, $\chi^2(2) = 7.22, p = .027$; number of times the MTE occurred, $\chi^2(2) = 14.18, p = .001$; IPV, Fisher's $\chi^2(1) = 11.39, p = .001$; insomnia, Fisher's $\chi^2(1) = 15.85, p < .001$; number of pregnancies, $\chi^2(3) = 8.88, p = .031$.

Further analysis using t-tests (Table 2) found women with perinatal PTSD symptoms had less social support, presented greater MTE, depression severity, and number of antenatal medical complications. Social support was lower among women with perinatal PTSD symptoms ($M = 4.60, SD = 1.21$) than for those without symptoms ($M = 5.18, SD = 1.05$); a significant difference of .59 (95% CI, 0.29 to 0.89), $t(141) = 3.88, p < .001$. Severity of the MTE was greater for women with perinatal PTSD symptoms ($M = 13, SD = 5.08$) than for those without ($M = 9.10, SD = 5.04$); a significant difference of -3.09 (95% CI, -5.22 to -2.59), $t(264) = -5.84, p < .001$. Severity of depression symptoms was also greater for women with perinatal PTSD symptoms ($M = 15.33, SD = 4.40$) than for those without symptoms ($M = 13.34, SD = 3.24$); a significant difference of -1.19 (95% CI, -3.05 to -0.93), $t(124) = -3.73, p < .001$. Antenatal medical complications were greater for women with perinatal PTSD symptoms ($M = 2.46, SD = 1.88$) than for those without ($M = 1.73, SD = 1.83$); a significant difference of -0.73 (95% CI, -1.32 to -0.14), $t(183) = -2.45, p < .015$.

A binomial logistic regression analysis was performed to identify factors that increase the odds of perinatal PTSD among women with perinatal depressive symptoms. The following variables were included in the regression model: social support, type of MTE (IPV) experienced, number of times the MTE occurred, intensity of MTE, depression symptom severity, insomnia, and number of antenatal medical complications. The logistic regression model was statistically significant, $\chi^2(10) = 44.26, p < .001$ (Table 3). The model explained between 23.7% (Cox & Snell R^2) and 33.3% (Nagelkerke R^2) of the variance in perinatal PTSD, and correctly classified 76.2% of cases. Sensitivity was 47.1%, specificity was 89.4%, positive predictive value was 66.7% and negative predictive value was 26.7%. Of the seven predictor variables, five were statistically significant: type of MTE, number of times MTE occurred, intensity of MTE, social support, and insomnia. The model indicated women who had been abused as adults, experienced two or more instances of the MTE, increased MTE severity, had insomnia, and low social support were more likely to present perinatal PTSD symptoms.

Discussion

This study describes risk factors for perinatal PTSD in a sample of ethnically/racially diverse women with depressive symptomatology. The DTS logistic regression indicates a fairly good

fit and includes instances of the MTEs (TEQ), insomnia, IPV, and reduced social support. These results are similar to other studies that support the association of depressive symptoms and IPV for low-income Latinas with perinatal PTSD symptoms (Rodríguez et al., 2008; Sumner et al., 2012) and the lack of social support (Andersen et al., 2012; Choi & Sikkema, 2016; Grekin & O'Hara, 2014).

Extant research has identified numerous factors that increase the risk for PTSD, but has primarily focused on risk factors related to postpartum PTSD. In recent years, in the mental health community, there has been a movement towards conceptualizing mental health disorders across a spectrum, with shared symptomatology, rather than as distinct disorders, as noted by the updated classification schemas of the DSM-5 (APA, 2013). Research in perinatal mood and anxiety disorders reflects this approach with greater attention to risk factors in the perinatal period and their relationship to postpartum outcomes. In addition, in both the clinical and research communities that focus on reproductive mental health, there is a growing recognition of the inherent complexity of co-morbid maternal mental health conditions both in the etiology and the manifestation of symptomatology (Chaudron, 2016; Fairbrother, Young, Janssen, Antony, & Tucker, 2015; Marchesi et al., 2016). In this study, perinatal depression and perinatal PTSD symptomatology were present in each trimester and postpartum. The antenatal presence indicates the need to routinely screen women not only during postpartum but also in each trimester of pregnancy. Routine screening of high-risk women in the perinatal environment may help in the identification and treatment of mothers needing services (Sorenson & Tschetter, 2010). Future studies should examine additional mental health screens during antenatal, intrapartum, and postpartum care (*Seng, Kohn-Wood, et al., 2011*). Given the clear association between maternal mental health status and prenatal complications, it is evident that early identification of risk factors, appropriate treatment referrals, and subsequent treatment utilization may significantly impact maternal and neonatal clinical outcomes.

The findings indicate perinatal PTSD rates as high as 30% in a predominately Latina population with low socioeconomic status. Even with the high rates, Latinas are less likely to utilize mental health care even if affordable (Baker-Ericzén et al., 2012; Cerda, 2003). Notably this avoidance of treatment may be coupled with stigma or shame with seeking treatment for mental health disorders (Fontes, 2007), the lack of culturally and linguistically appropriate mental health services, e.g., in the preferred language of clients (Aguilar-Gaxiola et al., 2012), and an important ethnically supported value of the Latina culture: the belief of *Marianismo*, maternal self-sacrifice in order to benefit the family, and *familismo*, the value of the family (Vazquez & Clauss-Ehlers, 2005). Consequently, Latinas may view traumatic events (distressing dreams or memories) differently, as an expected part of life versus viewing the events as perinatal PTSD symptoms. In this study, higher levels of social support were related to familismo, thus women may feel more comfortable discussing feelings with family in order to prevent social stigma and shame instead of seeking healthcare regarding a mental health disorder.

Drug and alcohol use were not significantly related to perinatal PTSD, but were significantly related to the number of traumatic events, measured by the TEQ in the bivariate analysis. This may result from underreporting since, according to the Treatment Episode Data Set and

the Institute of Medicine (IOM, 2006), drug, alcohol, and tobacco usage are historically underreported in the national population due to shame and social stigma (SAMHSA, 2014). Another possibility, suggested by the limited available research, involves less alcohol consumption in Latinas of Mexican descent (Connelly et al., 2013). Other national studies where drug use was not significant point to a positive maternal self-concept and/or the innate maternal need to protect the developing child in pregnancy (Massey et al., 2012). However, the paucity of research in this area requires additional studies to identify if these phenomena occur with all sensitive questions or whether mental health societal stigma causes women to self-report results less honestly.

The results of our analyses must be viewed in the context of their limitations. Self-report measures are not equivalent to a professional diagnosis and may not accurately identify women who are experiencing mental health disorders (Grekin & O'Hara, 2014). There may also be risk factors we did not investigate. Nonetheless our findings are important and provide new information regarding presence of psychosocial issues in economically and racially diverse women.

Conclusions

Further education for primary care, obstetric, and pediatric care providers on the complexity of maternal mental health conditions is warranted. Given their spectrum of etiology and the preponderance of co-morbidities, it is necessary to improve the identification and treatment of mental health problems. Fully understanding the implications of maternal mental health screening with regard to maternal and neonatal outcomes is a critical step in the process of integrating mental health care in non-psychiatric settings. Ultimately, developing and implementing collaborative care models that fully integrate holistic care and streamlined communication between providers is the ideal way to address the complexity of perinatal mood and anxiety disorders (Connelly et al., 2010).

It is important for healthcare providers to focus on the modifiable risk factors, including encouraging women to develop supportive environments. Further research is needed to evaluate the Latina perinatal population; Latinas may self-report trauma differently compared to standardized clinical assessments for PTSD symptoms. Research recommendations include examining when the traumas occur in relation to the perinatal period, why drug abuse may not be as prevalent in the perinatal period, and examining the effectiveness of early screening and intervention in the treatment of perinatal depression and perinatal PTSD. Research focused on perinatal PTSD in immigrant and minority women is warranted to clarify the impact of multiple risk factors that tend to co-exist and accumulate. Certain factors, low SES and decreased access to mental health services, are common challenges in this population and these realities need to be explored in light of this population's increased exposure to traumatic experiences. In order to better understand the higher likelihood of chronicity and poor health status with regard to untreated perinatal PTSD in vulnerable, underserved women, it is important to explore various cultural constructs related to mental health symptomology in general and to trauma associated symptoms in particular. Future research should aim to enhance our understanding of how trauma is internalized, and what meaning it holds for individual women. Do women attribute

any cultural and familial influences on their experience of previous or present trauma? Exploring the influence of intergenerational trauma in immigrant and minority women related to the perinatal period and the mothering transition can help us gain a better understanding of why trauma tends to occur in a cyclical fashion over time (*Stevens, Andrade, Korchmaros, & Sharron, 2015*).

In recent decades, research, education, clinical, and policy efforts have progressed with regard to our collective conceptualization and approach to the complex interplay of maternal mental health status and maternal and neonatal outcomes. This slow evolution has made it even clearer we still have much work to do to in improving our understanding of this vital period of vulnerability.

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Figure 1.
Flow diagram of the research selection process. EPDS, Edinburgh Postnatal Depression Scale; PTSD, Posttraumatic Stress Disorder

Table 1.Sociodemographic and clinical characteristics overall and by perinatal PTSD^a (N = 276)

Characteristic	Total <i>n</i> (%)	Positive <i>n</i> (%)	Negative <i>n</i> (%)	χ^2
Race, Ethnicity				10.20 *
Hispanic, Latino	209 (75.7)	58 (27.8)	151 (72.2)	
Caucasian	28 (10.1)	11 (39.3)	17 (60.7)	
Black, African-American	24 (8.7)	13 (54.2)	11 (45.8)	
Other	15 (5.4)	2 (13.3)	13 (86.7)	
Ethnicity ^b				2.93
Hispanic, Latino	209 (75.7)	58 (27.8)	151 (72.2)	
Not Hispanic, Latino	67 (24.3)	26 (38.8)	41 (61.2)	
Nativity Status ^b				0.44
Born in the U.S.	133 (48.2)	43 (32.3)	90 (67.7)	
Born outside the U.S.	143 (51.8)	41 (28.7)	102 (71.3)	
Language Spoken				4.19
English	128 (46.4)	43 (33.6)	85 (66.4)	
Spanish	140 (50.7)	41 (29.3)	99 (70.7)	
Other	8 (2.9)	0 (0)	8 (100)	
Marital Status				4.43
Married, living together	96 (34.8)	23 (24)	73 (76)	
Separated, divorced, widowed	30 (10.9)	13 (43.3)	17 (56.7)	
Never married, single	150 (54.3)	48 (32)	102 (68)	
Partner Status ^b				4.27 *
Have a partner	52 (18.8)	62 (27.7)	162 (72.3)	
Does not have a partner	224 (81.2)	22 (42.3)	30 (57.7)	
Education ^b				0.70
Less than high school	108 (39.3)	32 (29.6)	76 (70.4)	
High school or greater	167 (60.7)	52 (31.1)	115 (68.9)	
Household Income				4.86
Less than \$14,999	125 (45.3)	40 (32)	85 (68)	
\$15,000 to \$29,999	66 (23.9)	25 (37.9)	41 (62.1)	
\$30,000 or greater	37 (13.4)	7 (18.9)	30 (81.1)	
Don't know	48 (17.4)	12 (25)	36 (75)	
Type of MTE Experienced				7.21 *
Abuse when child	78 (28.4)	30 (38.5)	48 (61.5)	
Abuse when adult	62 (22.5)	23 (37.1)	39 (62.9)	
Other traumatic event	135 (49.1)	31 (23)	104 (77)	
No. Times the MTE Occurred				14.18 **
One	117 (43.2)	23 (19.7)	94 (80.3)	

Characteristic	Total <i>n</i> (%)	Positive <i>n</i> (%)	Negative <i>n</i> (%)	χ^2
Two	36 (13.3)	11 (30.6)	25 (69.4)	11.39 **
Three or more	118 (43.5)	50 (42.4)	68 (57.6)	
Intimate Partner Violence, AAS ^b				
Experienced IPV	47 (17)	24 (51.1)	23 (48.9)	2.03
Have not experienced IPV	229 (83)	60 (26.2)	169 (73.8)	
Harmful Drinking, TWEAK ^b				
Harmful drinking	76 (27.5)	28 (36.8)	48 (63.2)	0.16
No harmful drinking	200 (72.5)	56 (28)	144 (72)	
Drug Use, DAST-10 ^b				
Moderate to severe drug problem	36 (13)	12 (33.3)	24 (66.7)	15.85 ***
No moderate to severe drug problem	240 (87)	72 (30)	168 (70)	
Insomnia, ISI ^b				
Insomnia disorder	126 (50.4)	55 (43.7)	71 (56.3)	8.88 *
No insomnia disorder	124 (49.6)	25 (20.2)	99 (79.8)	
Gravida				
One	30 (16)	5 (16.7)	25 (83.3)	
Two	52 (27.7)	13 (25)	39 (75)	
Three	30 (16)	6 (20)	24 (80)	
Four or more	76 (40.4)	31 (40.8)	45 (59.2)	

Note. AAS, Abuse Assessment Screen; DAST-10, Drug Abuse Assessment Scale 10; ISI, Insomnia Severity Index; MTE, Most Traumatic Event; PTSD, posttraumatic stress disorder; TWEAK, Tolerance, Worried, Eye-opener, Amnesia, and K/Cut down on consumption.

^aPerinatal PTSD was calculated using a cut-off score of 32 on the Davidson Trauma Scale, with values ≥ 32 indicating the presence of PTSD symptomatology during the perinatal period.

^bFisher exact test.

*
 $p < .05$

**
 $p < .01$

 $p < .001$.

Table 2.

Sociodemographic and clinical differences between women with perinatal PTSD^a and those with no perinatal PTSD (N = 276)

Characteristic	Total <i>M (SD)</i>	Positive <i>M (SD)</i>	Negative <i>M (SD)</i>	<i>t</i>
Age	27.70 (6.21)	27.40 (6.00)	27.82 (6.31)	0.51
Social Support, MSPSS	5.01 (1.13)	4.60 (1.21)	5.18 (1.05)	3.88 ***
Intensity of MTE, TEQ	10.32 (5.36)	13.00 (5.08)	9.10 (5.04)	-5.84 ***
Depression Severity, EPDS	13.95 (3.74)	15.33 (4.40)	13.34 (3.24)	-3.73 ***
No. Antenatal Medical Complications	1.95 (1.87)	2.46 (1.88)	1.73 (1.83)	-2.45 *

Note. EPDS, Edinburgh Postnatal Depression Scale; MSPSS, Multidimensional Scale Of Perceived Social Support; MTE, Most Traumatic Event; PTSD, posttraumatic stress disorder; TEQ, Traumatic Events Questionnaire.

^aPerinatal PTSD was calculated using a cut-off score of 32 on the Davidson Trauma Scale, with values ≥ 32 indicating the presence of PTSD symptomatology during the perinatal period.

*
 $p < .05$

**
 $p < .01$

 $p < .001$

Table 3.

Logistic regression predicting likelihood of perinatal PTSD

Predictor	B	SE	Wald	df	p-value	OR (95% CI)
Social support	−0.38	.18	4.63	1	.031	0.69 (0.49 – 0.97)
Abuse when adult ^a	1.12	.55	4.22	1	.040	3.07 (1.05 – 8.95)
Two instances of MTE ^b	1.50	.64	5.47	1	.019	4.48 (1.28 – 15.72)
Three or more instances of MTE ^b	1.33	.53	6.25	1	.012	3.78 (1.33 – 10.74)
Intensity of MTE	0.12	.04	7.23	1	.007	1.12 (1.03 – 1.22)
Insomnia disorder ^c	1.09	.46	5.80	1	.016	3.00 (1.23 – 7.32)

Note. CI, confidence interval; df, degrees of freedom; MTE, most traumatic event; OR, odds ratio; PTSD, posttraumatic stress disorder; SE, standard error.

^aReference category is “Abused when child.”

^bReference category is “One instance of MTE.”

^cReference category is “No insomnia disorder.”