

STRESSFUL LIFE EVENTS AND SELF-REPORTED POSTPARTUM DEPRESSIVE SYMPTOMS 13-24 MONTHS AFTER LIVE BIRTH AMONG NON-HISPANIC AMERICAN INDIAN/ALASKA NATIVE MOTHERS IN OREGON: RESULTS FROM A POPULATION-BASED SURVEY

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Abstract. Objectives: We explored the association between stressful life events and postpartum depressive symptoms among non-Hispanic American Indian and Alaska Native (AI/AN) mothers. Methods: We analyzed self-reports of stressful life events and depressive symptoms from 298 AI/AN respondents and conducted logistic regression to examine their association. Results: Of the AI/AN mothers who responded, 29.7% reported depressive symptoms during their second postpartum year. Partner-related and traumatic stressful life events were significantly associated with increased risk of postpartum depressive symptoms. Conclusions: AI/AN women should receive intensive screening for depression through the second postpartum year. Programs that address stressful life events may be part of a plan to decrease postpartum depression.

INTRODUCTION

Research has shown that American Indian and Alaska Native (AI/AN) women experience high rates of stressful life events and intimate partner violence, including both physical and sexual assault (Walters & Simoni, 2002). Other research has found that AI/AN women experience high rates of depression (Evans-Campbell, Lindhorst, Huang, & Walters, 2006; Whitbeck, McMorris, Hoyt, Stubben, & Lafromboise, 2002). There is a lack of research exploring potential associations between postpartum stressful life events, including intimate partner violence, and postpartum depression among AI/AN women. This study attempts to fill that gap in the literature by exploring the association between stress and depressive symptoms

among mothers in their second postpartum year. It is hoped that this paper will help to guide clinical practice by improving the diagnosis and treatment of postpartum depression, which will ultimately lead to improved mental and physical health outcomes for both mothers and their children.

Postpartum depression was first described in the early 1950s (Hemphill, 1952). It was originally described as a biologic experience of middle class women (Brody, 1968) and was thought to be limited to the “baby blues,” which occurs shortly following childbirth and is thought to be due to hormonal causes, such as hormonal withdrawal (Kendell, 1987). However in the 1980s, researchers began to understand postpartum depression as a condition that persists beyond the immediate postpartum period, which can affect any mother and is influenced by external causes (Hapgood, Elkind, & Wright, 1988; O’Hara, Rehm, & Campbell, 1983; Paykel, Emms, & Rassaby, 1980). Symptoms of postpartum depression can include depressed mood or loss of interest or pleasure; changes in appetite, sleep, energy; difficulty thinking, concentrating, or making decisions; and suicidal ideation (American Psychiatric Association, 2013).

Most of the literature about the effects of postpartum depression on children is based on maternal depression in the first postpartum year. Studies have shown both short-term and long-term effects of maternal depression on infant physical growth, cognitive development, and behavioral adjustment (Murray et al., 1999; Surkan, Ettinger, Ahmed, Minkovitz, & Strobino, 2012). For example, children of depressed mothers are more likely to exhibit eating or sleeping difficulties (Righetti-Veltima, Conne-Perreard, Bousquet, & Manzano, 2002). A systematic literature review found that perinatal maternal mental health problems (including postpartum depression) increased the likelihood that school-age children experienced suboptimal global, behavioral, cognitive, and socio-emotional development (Kingston & Tough, 2014). Studies have described a number of maternal behaviors that may be altered by postpartum depression that may mediate these effects on children. Depressed mothers show less touch (Ferber, Feldman, & Makhoul, 2008), less smiling (Righetti-Veltima et al., 2002), less engagement (Lovejoy, Graczyk, O’Hare, & Neuman, 2000), and less infant-directed speech (Riessland, Shepherd, & Herrera, 2003) toward their child. Depressed mothers also show less reading, singing songs, telling stories, and playing games with their child (Paulson, Dauber, & Leiferman, 2006). In addition to these effects on behavior and development, children of depressed mothers may suffer other negative health effects. Depressed mothers are less likely to breastfeed (Field,

Hernandez-Reif, & Feijo, 2002; McLearn, Minkovitz, Strobino, Marks, & Hou, 2006a). Infants of depressed mothers are less likely to get routine well child care and less likely to receive up-to-date immunizations (Minkovitz et al., 2005). Depressed mothers are less likely to provide a safe environment including using car seats, safety latches, and electric outlet covers (McLearn, Minkovitz, Strobino, Marks, & Hou, 2006b).

Prevalence of postpartum depression depends on the diagnostic criteria used and the time frame over which the depression is measured (Boyce & Stubbs, 1994). A meta-analysis found a point prevalence of 8.5-11.0% during pregnancy and 6.5-12.9% for the first postpartum year (Gaynes et al., 2005). Most of these studies were predominantly of non-Hispanic White mothers. More recent studies have explored the prevalence of postpartum depression among minority women. A North Carolina study of a racially mixed U.S. population found depression in 18.7% of Native American women, 17.6% of White women, and 14.8% of African American women (Wei, Greaver, Marson, Herndon, & Rogers, 2008). Another study, based on Pregnancy Risk Assessment Monitoring System (PRAMS) data, used data from 17 states and found self-reported depressive symptoms among 9.0%-16.1% of White women, 18.6%-40.6% of non-Hispanic Black women, and 14.2%-23.4% of Hispanic women (Brett, Barfield, & Williams, 2008).

Many researchers have explored stressful life events including intimate partner violence. Prevalence estimates vary according to which events and what time periods are being explored. PRAMS is a collaborative program of the Center for Disease Control and Prevention (CDC) and state health departments. PRAMS surveys ask a standard set of questions about 13 stressful life events that may have occurred in the 12 months before delivery. Using those questions, a multi-state PRAMS study found that 64% of respondents reported having experienced at least one stressful life event (Whitehead, Brogan, Blackmore-Prince, & Hill, 2003). A North Carolina population-based study of postpartum women, using the same questions, found that 14% of women interviewed a few months after a live birth reported 5 or more stressful life events (Martin et al., 2001). In Oregon, using a different methodology, 13.3% of Oregon women 18 to 64 years of age were estimated to have been victims of physical abuse (physical assault, sexual coercion, or injury) by an intimate partner during the past year (Glick, Johnson, & Pham, 1999). Stressful life events, including intimate partner violence, have been found to be temporally associated with both pregnancy-related and non-pregnancy-related depression (Brown, 1970;

Golding, 1999; Gross, Wells, Radigan-Garcia, & Dietz, 2002; Herrick, 2000; Kessler, 1997; LaCoursiere, Hirst, & Barrett-Connor, 2012; O'Hara, 1995).

METHODS

Oregon PRAMS is a surveillance program supported by the CDC and implemented by the Oregon Public Health Division. The CDC PRAMS methodology has been described elsewhere (Gilbert, Shulman, Fischer, & Rogers, 1999). Oregon PRAMS methodology is similar to the CDC's. A stratified random sample of live births is drawn each month with oversampling of racial/ethnic minorities, including AI/AN women. Mothers receive a second survey, PRAMS-2, shortly after the index child's second birthday. This analysis is based on data from PRAMS-selected women who had a live birth in 2004-2007 and completed both the PRAMS and the PRAMS-2 surveys. Birth certificates and PRAMS and PRAMS-2 data were linked to create the final dataset.

The Oregon PRAMS-2 survey includes questions on maternal depressive symptoms and stressful life events, including intimate partner violence. Like PRAMS, the Oregon PRAMS-2 survey is administered by mail and phone in both English and Spanish. The mean age of the index child when the mother responds to the PRAMS and PRAMS-2 surveys is, respectively, 3 and 25 months. Because PRAMS oversamples for maternal race/ethnicity, a complex weighting mechanism is used in order to adjust for the stratified sampling. In addition to weighting for maternal race/ethnicity, the data is also weighted for non-response and non-coverage (caused by failure to reach individuals depending on the contact method).

The sample for this study was drawn from the 183,275 live births from January 1, 2004 through December 31, 2007 in Oregon. Of the 11,684 women who were sampled, 7,684 women responded to the PRAMS survey. Among these, 3,938 women responded to the PRAMS-2 survey. Among these, 462 women were identified as non-Hispanic American Indian or Alaska Native (AI/AN). Weighting back to the original PRAMS sampling frame, the weighted response rate for PRAMS-2 was 27.6% among AI/AN women. After excluding the 162 women who had been pregnant since the birth of the index child and 2 women who did not answer the question regarding pregnancies since the birth of the index child, our final sample consisted of 298 AI/AN women.

Access to the PRAMS-2 data for this study was facilitated by the authors who include staff at the Oregon Public Health Division, the institution that conducts the survey in conjunction with the CDC. The Oregon Public Health Division has a data use agreement with the CDC which mandates confidentiality measures to protect the participants of the survey.

Definition of Outcome Measures

The main outcome measure in this analysis is self-reported symptoms of depression 13 to 24 months after the birth of the index child from the PRAMS-2 survey (shortly after the child's second birthday). Mothers were asked whether, in the past 12 months, there had been a period of two or more weeks when they had been a) sad, blue, or depressed for most of the day and/or b) lost interest or pleasure in most things they usually cared about or enjoyed. Mothers were considered to have self-reported depressive symptoms if they answered "yes" to either of these questions. These questions were modeled after questions used in the PRAMS survey. This method of assessing the presence of depressive symptoms has been shown to be useful for detecting depression in primary care and perinatal settings (Gjerdingen, Crow, McGovern, Miner, & Center, 2009; Kroenke, Spitzer, & Williams, 2003; Smith, Gotman, Lin, & Yonkers, 2010; Whooley, Avins, Miranda, & Browner, 1997). The U.S. Preventive Services Task Force (USPSTF) concluded that "shorter screening tests, including simply asking questions about depressed mood and anhedonia, seem to detect most depressed patients and, in some cases, do better than the original instrument from which they were derived." This conclusion may not be completely accurate among AI/AN populations since cultural accuracy of this approach was not tested (USPSTF, 2009). Future research could involve determining the sensitivity and specificity of the questions in PRAMS-2 for identifying depressive symptoms.

Definition of Covariates

PRAMS-2 asked mothers whether they experienced any of 13 stressful life events in the past 12 months. These events are similar to those asked in the PRAMS survey (at about 3 months postpartum) and categorized using principal component analysis (Ahluwalia, Merritt, Beck, & Rogers, 2001). This categorization has been used by other researchers (Dozier, Nelson, & Brownell, 2012; Gross et al., 2002; Jewell, Dunn, Bondy, & Lieferman, 2010; LaCoursiere et al., 2012; Lu & Chen, 2004). Partner-related stressful life events were affirmative responses to "I got

separated or divorced from my spouse or partner” or “I argued with my spouse or partner more than usual.” Traumatic stressful life events were “I was homeless,” “I was in a physical fight,” “my spouse or partner or I went to jail,” or “someone very close to me had a bad problem with drinking or drugs.” Financial stressful life events were “I moved to a new address,” “I lost my job even though I wanted to go on working,” “my spouse or partner lost his or her job,” or “I had a lot of bills I couldn’t pay.” Emotional stressful life events were “A close family member was very sick and had to go into the hospital,” “I was very sick,” or “someone very close to me died.” If mothers answered “yes” to any of the events in a category, they were considered to have experienced that category of stressful life event.

Mothers were also asked in PRAMS-2 about five different types of intimate partner violence in the 12 months before completion of the survey. The questions asked whether an intimate partner (current or former spouse, boyfriend, girlfriend, or date) had 1) yelled and screamed at you, threatened you, or made you feel unsafe; 2) tried to limit your contact with family or friends; 3) prevented you from knowing about or having access to your shared income, even when you asked; 4) pushed, hit, slapped, kicked, choked, or physically hurt you in any other way; or 5) had sex with you against your will or without your consent. If mothers responded “yes” to any of these options, they were considered to have experienced intimate partner violence. Because of Oregon child abuse laws and the desire to maximize the confidentiality of respondents, PRAMS and PRAMS-2 do not ask questions about intimate partner violence of women who were less than 20 years old at the time of the index birth. The 24 women in the study sample who were less than 20 years old were counted as “no” responses to the intimate partner violence variable.

Other covariates examined were maternal age at birth and urban/rural county of residence from the birth certificate; pregnancy intention from PRAMS; and maternal education, marital status, social support, and poverty status from PRAMS-2. Using household income and number of household dependents, respondents were categorized as being either less than or greater or equal to 100% of the Federal Poverty Level (FPL; U.S. Department of Health and Human Services, 2013). Mother’s county of residence was categorized as rural if she lived in a county with less than 60 persons per square mile according to the 2010 census.

Statistical Techniques

To confirm the results of previous studies, prevalence rates of postpartum depressive symptoms and stressful life events, including intimate partner violence, were calculated among the analysis sample of AI/AN mothers. Bivariate logistic regression was conducted to examine the association between each covariate and postpartum depressive symptoms separately among the analysis sample. Multivariable logistic regression was then conducted using a backwards elimination technique to determine which covariates were statistically significantly associated with postpartum depressive symptoms among AI/AN women. The initial multivariable model included each of the four categories of stressful life events, intimate partner violence, and the seven other covariates previously described and listed in Table 1. Multivariable logistic regression was run and the covariate with the least significant association to self-reported depressive symptoms was removed from the model. This process was repeated until only covariates with a significance of p -value < 0.05 remained in the model. Unless otherwise noted, all frequencies are unweighted and all percentages are weighted. Stata 11.0 was used to account for the three stage complex survey weighted design.

RESULTS

Among the 298 non-Hispanic AI/AN respondents, 29.7% experienced self-reported depressive symptoms 13-24 months postpartum. In terms of stressful life experiences, 68.0% reported financial events, 60.8% reported emotional events, 45.8% reported partner-related events, 37.9% reported traumatic events, and 18.7% reported intimate partner violence (see Table 1).

Table 1
Prevalence of self-reported depressive symptoms and stressful life events including intimate partner violence 13-24 months postpartum among non-Hispanic AI/AN mothers of 2 year olds in Oregon who had not been pregnant again since the birth of the index child, Oregon PRAMS-2, 2004-2007 births ($n = 298$)

Covariate	Unweighted Frequency	Weighted Percentage
Postpartum Depressive Symptoms	85	29.7%
Partner-related stressful life events	132	45.8%
Separated or divorced from partner	45	14.5%
Argued with spouse or partner more than usual	100	34.3%
Traumatic stressful life events	106	37.9%
Became homeless	22	7.8%
Was in a physical fight	20	6.8%

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Table 1, Continued
Prevalence of self-reported depressive symptoms and stressful life events including intimate partner violence 13-24 months postpartum among non-Hispanic AI/AN mothers of 2 year olds in Oregon who had not been pregnant again since the birth of the index child, Oregon PRAMS-2, 2004-2007 births (n = 298)

Covariate	Unweighted Frequency	Weighted Percentage
Traumatic stressful life events		
Spouse, partner or self went to jail	28	9.4%
Someone very close had a problem with drinking or drugs	91	31.7%
Financial stressful life events	193	68.0%
Moved to a new address	100	33.3%
Lost own job	33	11.4%
Spouse or partner lost job	44	15.8%
Had a lot of bills they couldn't pay	143	48.9%
Emotional stressful life events	178	60.8%
Family member was hospitalized	132	46.5%
Were very sick themselves	66	22.3%
Someone very close to them died	83	28.8%
Intimate partner violence	49	18.7%
Verbal abuse	41	14.5%
Limitation of contact with friends or family	18	6.4%
Prevention of access to income	12	3.9%
Physical abuse	19	6.0%
Sexual abuse	1	0.4%

Among the 298 non-Hispanic AI/AN respondents, women with the following characteristics were the most likely to have reported depressive symptoms 13-24 months postpartum: those who experienced intimate partner violence, those with low or no social support, those with less than a 12th grade education, those who are < 20 years old, those who experienced at least one traumatic stressful life event, and those who experienced at least one partner related stressful life event (see Table 2).

In bivariate logistic regression analyses, all four categories of stressful life events including intimate partner violence were significantly associated with self-reported postpartum depressive symptoms. In addition, low maternal education, low household income, low maternal social support, and single marital status were associated with postpartum depressive symptoms. In multivariable logistic regression analyses, the covariates that were significantly associated with self-reported postpartum depressive symptoms were having had at least one partner-related stressful life event (AOR 2.40, 95% confidence interval 1.34-4.30) or at least one traumatic stressful life event (AOR 2.11, 95% confidence interval 1.17-3.79; see Table 2).

Table 2
Self-reported depressive symptoms 13-24 months postpartum among non-Hispanic AI/AN mothers of 2 year olds in Oregon, Oregon PRAMS-2, 2004-2007 births (n = 298)

Risk Factor	n (unweighted)	% Depressed (weighted)	Bivariate OR (95% CI)	Multivariable OR (95% CI)
Total	298			
Partner-Related Stressful Life Events ^{a,*}				
Yes	132	43.5%	2.92 (1.70-5.00)	2.40 (1.34-4.30)
No	166	20.8%	Referent	Referent
Traumatic Stressful Life Events ^{b,*}				
Yes	106	44.4%	2.66 (1.56-4.54)	2.11 (1.17-3.79)
No	192	23.1%	Referent	Referent
Financial Stressful Life Events ^{c,*}				
Yes	193	39.5%	3.68 (1.95-6.94)	
No	105	15.1%	Referent	
Emotional Stressful Life Events ^{d,*}				
Yes	178	35.6%	1.76 (1.01-3.07)	
No	120	23.9%	Referent	
Intimate Partner Violence*				
Yes	49	51.8%	3.07 (1.59-5.92)	
No	244	25.9%	Referent	
Pregnancy Intention				
Pregnancy Unintended	128	36.1%	1.63 (0.96-2.75)	
Pregnancy Intended	168	25.8%	Referent	
Maternal Social Support [†]				
None/Low Support	32	51.7%	2.70 (1.23-5.93)	
Moderate/High Support	264	28.4%	Referent	
Maternal Age at Birth				
<20 years old	24	44.2%	1.93 (0.83-4.80)	
20 to 34 years old	232	29.0%	Referent	
>=35 years old	42	34.8%	1.31 (0.62-2.78)	
Marital Status [†]				
Not Married	137	39.8%	2.27 (1.33-3.86)	
Married	161	22.6%	Referent	
Maternal Education [†]				
Less than 12th grade	33	49.4%	2.85 (1.28-6.32)	
12th grade or GED	95	32.4%	1.28 (0.72-2.29)	
More than 12th Grade	169	26.2%	Referent	
Household Income [†]				
<=100% Federal Poverty Level	111	42.5%	2.54 (1.47-4.39)	
>100% Federal Poverty Level	172	22.6%	Referent	
Maternal Residence at Child's Birth				
Rural County	137	30.3%	Referent	
Urban County	161	31.8%	1.08 (0.64-1.81)	

^a Partner-Related Stressful Life Events: separated/divorced, argued more than usual

^b Traumatic Stressful Life Events: homeless, physical fight, went to jail, problem with drinking/drugs

^c Financial Stressful Life Events: moved, lost job, lot of bills

^d Emotional Stressful Life Events: family member hospitalized, very sick, someone close died

*13-24 months postpartum

[†] At 24 months postpartum

Not all columns of unweighted numbers add up to 298 because of unanswered questions.

DISCUSSION

Three main themes will be included in the following discussion. These include causes of postpartum depression among AI/AN women, including historical and current trauma, methods of detection and diagnosis of postpartum depression, and treatment of postpartum depression and other mental health conditions among AI/AN communities.

Since colonial times, European-Americans throughout North America, including the Pacific Northwest, have made and broken treaties with American Indians, established and abolished reservations, and vacillated between extermination and assimilation of AI/AN people. In Oregon, tribes were confined to reservations as early as 1840 (Haines, 1950). Twentieth century federal assimilation policy for selected tribes led to decreased economic opportunities and decreased social supports. For example, the Klamath tribes in southern Oregon were relatively wealthy in the early 1950s from harvesting timber on their lands (Haynal, 2000). The Klamath tribes were terminated in 1954, leading to tribal members being cut off from services for education, health care, housing, and related resources. Termination directly caused decay within the tribe, including poverty, alcoholism, high suicide rates, low educational achievement, disintegration of the family, poor housing, high school dropout rates, disproportionate numbers in penal institutions, increased infant mortality, decreased life expectancy, and loss of identity (Clements, 2009).

High Prevalence of Postpartum Depressive Symptoms and Stressful Life Events Among AI/AN Women

We found high levels of postpartum depressive symptoms and stressful life events, including intimate partner violence, among AI/AN women 13-24 months after a live birth. Findings from previous studies on the prevalence of depression among AI/AN communities have been mixed, with some finding rates lower than the general population (Beals et al., 2005; Brett et al., 2008) and some finding rates higher (Duran et al., 2004; Wei et al., 2008). Findings from previous studies on stress experienced by AI/AN communities have also yielded mixed results (Manson, Beals, Klein, & Croy, 2005; Sarche, Tafoya, Groy, & Hill, 2017).

Low maternal education, low household income, and low maternal social support were associated with postpartum depressive symptoms in bivariate analysis but were not in the final model due to a lack of statistical significance. We found that partner-related stressful life events

(separated/divorced or arguing) and traumatic stressful life events (homeless, fighting, jail, drinking/drug use) were statistically significantly associated with postpartum depressive symptoms. The behavioral effects of alcohol and drugs for many AI/ANs have followed the historical trauma of shame, fear, and anger that has passed from one generation to the next as a consequence of federal policies to displace AI/ANs and assimilate them away from reservations. Our findings point toward the need for upstream interventions to decrease postpartum depression. Our study seems to be the first to have studied self-reported postpartum depressive symptoms among AI/AN women in the second postpartum year.

The Life Course perspective provides a framework to understand the impact of a variety of stressors over multiple generations (Fine & Kotelchuck, 2010). The stressful life event questions on the PRAMS-2 survey are an imperfect proxy for chronic stress. The assessment of chronic stress would probably be improved by adding information about perceived discrimination, as asked on a few PRAMS surveys. Most of the work about chronic stress and racism has explored chronic stresses experienced by Black women, but it is possible that the chronic stresses experienced by AI/AN women are associated with similar outcomes. For AI/ANs in the U.S., the relationship with Europeans has been very stressful. Many of our respondents and their ancestors likely endured forced assimilation, poverty, and racism (Brown, 1970; Dunbar-Ortiz, 2014). Federal boarding schools in Oregon began in the 19th century and “focused on the destruction of Native languages and cultures and the enforcement of assimilation policies” (Collins, 2015). The removal of one to three generations of children to boarding schools has resulted in parents who do not have the parenting and coping skills that many who grew up with their parents and grandparents possess. Likewise, federal policies displaced AI/ANs onto reservations that lacked capital to support economies with education, training, jobs, and natural resources. These factors all contribute to lost hope and depression among mothers of young children.

More Early Detection for Postpartum AI/AN Women Who Experience Stressful Life Events

We found an association, in the second postpartum year, between depressive symptoms and two types of stressful life events (partner-related and traumatic). Our findings are consistent with previous research about depression in the first postpartum year (Gross et al., 2002; Herrick, 2000; O’Hara, 1995), but no research has explored stressful life events and depression after the

first postpartum year. Other covariates which had significant bivariate associations with postpartum depressive symptoms did not survive in the final multivariable model. This may be due to collinearity between similar types of stress or demographic variables. Of note is the fact that the covariates which did not survive the multivariable modelling include chronic types of stress such as having low social support, being unmarried, having low education, and being low income.

Clinicians should increase efforts to systematically screen for intimate partner violence, other stressful life events, and depression throughout the first and second postpartum year and facilitate connection with behavioral health, community, and social service resources to help women during pregnancy and the postpartum period. Researchers should also explore whether any of the following activities lead to decreased stressful life events: programs to increase father involvement; prenatal providers routinely screening for partner-related issues; and programs to increase social support for the mother from either family members or peer support groups.

Clinical Implications

We found that 29.7% of AI/AN women in the sample reported depressive symptoms during their second postpartum year. To the extent to which providers screen for postpartum depression, that screening is usually done in the first three postpartum months. Our findings imply that the period for screening should be expanded at least through the second postpartum year.

Screening alone is not sufficient to reduce rates of postpartum depression. The USPSTF recommends screening adults for depression when staff-assisted depression care supports are in place to assure accurate diagnosis, effective treatment, and follow-up (O'Connor, Whitlock, Beil, & Gaynes, 2009; U.S. Preventive Task Force, 2009). They found that “primary care depression screening programs were likely to be effective when other staff provided part of the depression care, such as assessment and monitoring in coordination with the primary care provider’s treatment, or when extra efforts were made to enroll patients in specialty mental health treatment” (O'Connor et al., 2009).

Many communities have insufficient capacity to provide care for women with postpartum depression. There is need for increased funding of the Indian Health Service (IHS) and urban programs within IHS. Providers screening postpartum women will need to develop systems to

help women who have been screened and diagnosed. Many providers will need further training to increase their ability to provide care for depressed women. IHS has supported efforts to integrate behavioral health care with primary care across Indian Country through the Improving Patient Care collaborative since 2006 (IHS, 2010). Incentives such as those being directed at the formation of Accountable Care Organizations (Coordinated Care Organizations in Oregon) and Patient Centered Medical Homes may help providers to develop integrated behavioral health and primary care practice models in an effort to increase availability of services. Unfortunately, these systems do not integrate with the Indian health system so almost all Indian health providers are excluded from the process. Accountable Care Organizations could learn from integrated care that IHS has been delivering since 1955.

A 2012 (Urban Indian Health Institute, 2012) review of literature about depression among AI/ANs does not focus on pregnancy-related depression but makes broad suggestions about prevention and treatment of depression for all AI/ANs. Their suggestions include: including family and community; incorporating traditional knowledge of health and spirituality; using prevention and treatment methods that focus on active skills building; integrating screening and treatment with prevention or primary care; and expanding cultural competency of mental health providers. They recommend further research into the relative effectiveness of Western mental health treatment methods versus more culturally-grounded approaches to treatment. They also recommend further research into pathways to care and help-seeking behaviors of AI/ANs to explore barriers to care.

Although many women have little contact with their own providers during the first and second postpartum years, they have multiple visits with their pediatric provider for well child care. An encouraging new approach to care for women with postpartum depression is to have pediatricians screen, refer, and treat mothers when they bring their children for well child care. The American Academy of Pediatrics (AAP) encourages pediatricians to implement postpartum depression screening, referral, and treatment (Earls, 2010). Recent work has found that this approach is effective (Chaudron, Szilagyi, Campbell, Mounts, & McInerney, 2007; Chaudron et al., 2004; Olson et al., 2005; Sheeder, Kabir, & Stafford, 2009). The Oregon Pediatric Society (the Oregon chapter of the AAP) trains primary care providers to screen mothers for postpartum depression (Oregon Pediatric Society, n.d.). More recently, the AAP Committee on Native American Child Health (CONACH) has assessed IHS, Tribal, and urban Indian clinical practices

in the Northwest, including Oregon, in their ability to provide this care and encouraged efforts to improve pediatric-based screening for maternal depression. Another opportunity for accessing AI/AN mothers in order to identify and address postpartum depression is through home visiting programs, such as the Maternal, Infant, and Early Childhood Tribal Home Visiting program. These programs have demonstrated success in improving the parenting skills and mental health of AI/AN mothers (Barlow et al., 2015; Lyon et al., 2015).

Resiliency and Traditional Spiritual Practices as Protective Factors

While clinical intervention is a crucial component of addressing the high prevalence of postpartum depression among AI/AN women in Oregon, traditional cultural and spiritual practices that build on resilience are also important protective factors that must be considered. Multiple studies have found that AI/AN individuals who participate in traditional cultural and spiritual practices have lower rates of mental health conditions such as depression (Kading et al., 2015, Shendo et al., 2012; Wexler, 2006). In addition, interventions to address depression among AI/AN individuals have been found to be more successful when they incorporate traditional cultural practices and support in addition to treatments such as psychotherapy and pharmaceutical intervention (Gone, 2009; Gone & Alcántara, 2007). One of the key components of involving traditional culture in interventions to address depression among AI/AN women is that these practices develop resiliency, which helps to offset the impact of stressful life events (Kirmayer, Dandeneau, & Williamson, 2011; Tsethlikai & Rogoff, 2013). Ensuring that the strengths of AI/AN communities are leveraged by including traditional culture, practices, and spirituality as key components of any depression intervention will facilitate the best possible mental health outcomes for AI/AN women in Oregon.

Limitations

The main limitation of this study is that it is cross sectional since both the independent and dependent variables are assessed for the second postpartum year, and the lack of temporality means we therefore cannot assess causality. We believe that it is more likely that depressive symptoms result from, rather than cause, stressful life events. Another limitation is that all data is self-reported; however, the validity of self-report, specifically for PRAMS methodology, has been found to be superior to interview for certain exposures and behaviors (Beck et al., 2002). A

further limitation is that the weighted response rate in PRAMS-2 for AI/AN women was 27.6%. Other limitations of the methodology included being unable to determine if the maternal county of residence at 25 months postpartum was the same as at birth (for the purpose of calculating rurality) and how many mothers < 20 years of age experienced intimate partner violence. In addition, the PRAMS and PRAMS-2 survey questions are not developed to be specifically culturally responsive to AI/AN women. Further research could involve evaluating the appropriateness of these surveys among AI/AN women and the potential development of a culturally specific survey. A final limitation of the study is that the generalizability of the findings to AI/AN women outside of Oregon are not clear.

Strengths

The main strength of this study is that it is a population-based random sample of AI/AN residents who had a live birth in Oregon. Our results are therefore generalizable to all Oregon AI/AN women. Another strength is that due to the structure of the follow-back survey, we were able to explore depressive symptoms in the second postpartum year. Additionally, the survey design allows inquiry about stressful life events in the second postpartum year. Finally, the study helps to fill a gap in the literature on the effects of stress on depressive symptoms in the second postpartum year among AI/AN mothers.

CONCLUSIONS

AI/AN women in Oregon are at high risk of postpartum stressful life events and depression. Women who have experienced partner-related and traumatic postpartum stressful life events are at significantly increased risk for postpartum depressive symptoms. Providers should systematically screen pregnant and postpartum women for stressful life events in addition to routine screening for depression at least through the second postpartum year. Women who are found to have depressive symptoms should be referred for care; integration of primary care and behavioral health in the provider's office can help facilitate coordinated care for postpartum depression. Pediatric providers should be enlisted to screen mothers for depression and refer them for treatment when young children come for well child care. Further research is needed to explore whether early detection and remediation of stressful life events can decrease postpartum depression.

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