Research paper

Subconstructs of the Edinburgh Postpartum Depression Scale in a postpartum sample in Mexico City

Julie D. Flom[a], Yueh-Hsiu Mathilda Chiu[a,b], Marcela Tamayo-Ortiz[c], Lourdes Schnaas[d], Paul C. Curtin[b], Rosalind J. Wright[a,b,e], Robert O Wright[b,e], Martha M Téllez-Rojo[f], Maria José Rosa[b,*]

[a] Department of Pediatrics, Kravis Children's Hospital, Icahn School of Medicine at Mount Sinai, New York, NY, USA
[b] Department of Environmental Medicine and Public Health, Icahn School of Medicine at Mount Sinai, One Gustave L. Levy Place, Box 1057, New York, NY 10029, USA
[c] National Council of Science and Technology, Mexico City, Mexico
[d] National Institute of Perinatology, Mexico City, Mexico
[e] Institute for Exposomic Research, Icahn School of Medicine at Mount Sinai, New York, NY, USA
[f] National Institute of Public Health, Cuernavaca, Morelos, Mexico

A B S T R A C T

Background: Postpartum depression is an important cause of morbidity in mothers and children. The Edinburgh Postpartum Depression Scale (EPDS), the most widely used self-reported measure of postpartum depression, was conceived as a one-dimensional measure. However, evidence that depressive symptoms may be experienced differentially across cultural and racial groups highlights the need to examine structural equivalence using factor analysis across populations. Variation in factor structure for the EPDS remains understudied in middle/low income countries.

Methods: We examined the factor structure of the EPDS assessed 6 months postpartum in 628 Mexican women in a longitudinal Mexico City birth cohort. We performed exploratory factor analysis (EFA) to determine the optimal fit in our sample and confirmatory factor analysis (CFA) to examine the fit of two- and three-factor models previously reported in Hispanic populations.

Results: The majority of participants had no more than high school education (77%), maternal age was 28 ± 5.4 years and the mean total EPDS score was 6.72 ± 5.8. Using EFA, we identified that the three-factor model provided the optimal fit, with subscales for depression, anxiety, and anhedonia. CFA confirmed that the three-factor model provided the best fit.

Limitations: The study population was lower SES, potentially limiting generalizability. The single administration of the EPDS measure in the postpartum period limited our ability to assess stability over time.

Conclusions: Better delineation of the multi-factorial structure of the EPDS will allow a more comprehensive understanding of psychological functioning in postpartum women and better inform diagnosis, management and policy.

1. Introduction

Postpartum depression (PPD) has profound consequences for the health of the mother as well as for the child, with impacts on attachment, infant growth and neurodevelopment as well as maternal mortality and subsequent mental health (Gelaye et al., 2016; Nieto et al., 2017; Surkan et al., 2011; Wisner et al., 2006). PPD is common worldwide with prevalence of depressive symptoms in the first year postpartum ranging from 6 to 38% in developed countries and 20 to 57% in developing countries (Lara et al., 2015; Norhayati et al., 2015).

PPD is a particular concern in low and middle income countries given that its prevalence is higher and resources for diagnosis and management are more limited (Lara et al., 2015; Place et al., 2016; Shrestha et al., 2016). Understanding patterns of depressive symptoms in the postpartum period would inform clinical practice, policy, and the development of screening tools and interventions to improve health outcomes.

Variations in the epidemiology of PPD by race/ethnicity have been seen in the United States (US) (Liu and Tronick, 2013), Asia and Africa (Fisher et al., 2012). In the US and United Kingdom (UK), studies have revealed higher rates of PPD in immigrants from non-English- speaking countries (Liu and Tronick, 2014; Onozawa et al., 2003), in particular women from Latin American countries (Liu and Tronick, 2013). In one US population, rates varied dramatically among Hispanic women by country of origin - immigrants from Mexico, Central America or South America had higher rates of PPD (32%) in comparison to immigrants from Puerto Rico or the Dominican Republic (17.24%), with much lower rates in US-born Hispanic women (7.14%) (Doe et al., 2017). There are fewer studies in Latin American countries including Mexico; however, the existing literature suggests the prevalence may be as high as 32% (de Castro et al., 2015; Lara et al., 2015).

Diagnosis of PPD involves presence of depressed mood and/or anhedonia (American Psychiatric Association, 2013) and there are several measures used in the literature that rely on clinical interview or self-report (Norhayati et al., 2015). Depressed mood reflects high negative affect whereas anhedonia reflects low positive affect with evidence that affective states vary by culture and race/ethnicity (Kanazawa et al., 2007). One of the most widely used scales to identify depressive symptoms in the postpartum period is the Edinburgh Postpartum Depression Scale (EPDS) (Cox et al., 1987), which has been validated in several populations and languages worldwide (Alvarado-Esquivel et al., 2016,2006; Gelaye et al., 2016; Howard et al., 2014; Norhayati et al., 2015).

The EPDS is a 10-item scale which was constructed as a unidimensional tool to screen for postpartum depression (Cox et al., 1987). However, several studies have demonstrated that, rather than providing a raw score applicable solely to postpartum depression screening, the EPDS identifies multiple dimensions of postpartum psychological functioning, specifically depression, anxiety and anhedonia (Hartley et al., 2014; Matthey et al., 2013; Phillips et al., 2009). This is supported by evidence that positive EPDS screens have been associated with other mental health disorders including anxiety (Milgrom et al., 2005) and that specific items on the scale can discriminate between depression and anxiety (Phillips et al., 2009). There is a growing body of literature analyzing the optimal factor structure, with the best fit often seen for two- or three-factor solutions that include depressive symptoms as well as symptoms of anxiety and/or anhedonia.

A growing body of literature demonstrates variability in factor structure across race/ethnicity and culture (Chiu et al., 2017; Hartley et al., 2014; King, 2012; Kozinszky et al., 2017; Shrestha et al., 2016). In a study of Hispanic women in the US, Hartley et al. reported a two-factor structure of depressive and anxiety symptoms as the best fit (Hartley et al., 2014). Chiu et al. investigated the EPDS factor structure in a multi-ethnic urban Boston sample and reported a three-factor model as the best fit for all race/ethnicities but identified differences in loading of specific items for Hispanic women compared to white and African American women (Chiu et al., 2017). The observed differences across studies have been attributed to differences in cultural and linguistic translation, study population, at what point in time during the perinatal period the questionnaire was administered and statistical methodology (Shrestha et al., 2016). Additionally, there are cultural differences in depression phenotypes and recent data supports that the prevalence of depression and anhedonia varies by race/ethnicity (Liu and Tronick, 2014).

Given that maternal mental health conditions are amenable to intervention and have enormous implications for health outcomes, it is important to accurately characterize these disorders to inform decision making on a clinical and policy level (Place et al., 2016; Lara et al., 2015; Wainberg et al., 2017). Understanding the factor structure of the EPDS in native Mexican women is critical to better understand the epidemiology of postpartum mental health conditions including depression and anxiety in this population and to develop and implement interventions on a population scale to improve outcomes through prevention, diagnosis and treatment.

The EPDS has been validated treating it as a unidimensional scale to screen for postpartum depression in native Mexican populations. To our knowledge, no study to date has evaluated the underlying factor structure in this population, specifically whether individual items associate with postpartum anxiety, anhedonia or other mental health conditions. Therefore, the main aim of the present study is to evaluate the factor structure of the EPDS in native Mexican women in a large prospective birth cohort in Mexico City, Mexico. We hypothesized that a 2- or 3-factor model, using identical EPDS items as previous studies, would demonstrate the best fit in this population. In this study, we 1) perform an exploratory factor analysis (EFA) to identify the optimal number of factors to explain variability in EPDS and 2) use confirmatory factor analysis (CFA) to determine the number of factors that best fit our data and to better understand the underlying structure of the EPDS in this cohort of native Mexican women.

2. Methods

2.1. Study participants

Participants in this study were from Programming Research in Obesity, Growth, Environment and Social Stressors (PROGRESS), which recruited pregnant women who were receiving health services and prenatal care through the Mexican Social Security System (Instituto Mexicano del Seguro Social –IMSS) between July 2007 and February 2011. The women had to meet the following eligibility criteria in order to participate: less than 20 weeks gestation, at least 18 years old, planned to stay in Mexico City for the next 3 years, reported no medical history of heart or kidney disease, had telephone access, did not consume alcohol daily, and reported no use of any steroid or anti-epilepsy medications.

For the PROGRESS cohort, 3898 women were approached, 3274 were eligible and 1057 (32% of those eligible) agreed to participate (Burris et al., 2013). Following birth, 815 mother-child dyads had at least one follow-up visit and 628 (77%) women completed the Spanish version of the EPDS (Cox et al., 1987) which was previously validated in Mexican populations (Oquendo et al., 2008; Ortega et al., 2001) at 6 months postpartum. The 10-item EPDS asks about symptoms in the past 7 days including: "1: I have laughed and been able to see the funny side of things", "2: I have looked forward with enjoyment to things", "3: I have blamed myself unnecessarily when things went wrong", "4: I have been anxious or worried for no good reason", "5: I have felt scared or panicky for no very good reason", "6: Things have been getting on top of me", "7: I have been so unhappy that I have had difficulty sleeping", "8: I have felt sad or miserable", "9: I have been so unhappy that I have been crying", and "10: The thought of harming myself has occurred to me". Participants rate the severity or frequency of each item based on 4 levels scored from 0 indicating the most favorable condition to 3 indicating the least favorable condition for each item. Total scores can potentially range from 0 to 30.

Sociodemographic information was collected at enrollment through a questionnaire. Thirteen variables were used to classify study families into six levels based on the socioeconomic status (SES) index created by the Asociación Mexicana de Agencias de Investigación de Mercados y Opinión Pública (AMAI) (Carrasco, 2002). These levels were then collapsed into low, medium, and high socioeconomic status. Maternal age at delivery was derived from mother's date of birth and child's date of birth which was extracted from the medical record. Procedures were approved by institutional review boards at the Harvard School of Public Health, Icahn School of Medicine at Mount Sinai, and the Mexican National Institute of Public Health. Women provided written informed