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Acculturative stress negatively impacts maternal depressive symptoms in Mexican-American women during pregnancy

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Abstract

Background—Mexican-American women exhibit high rates of prenatal maternal depressive symptoms relative to the general population. Though pregnant acculturated Mexican-American women experience cultural stressors such as acculturation, acculturative stress and discrimination that may contribute to elevated depressive symptoms, the contribution of these socio-cultural correlates to depressive symptomology is unknown.

Method—Ninety-eight pregnant women of Mexican descent were recruited from a community hospital clinic during their first trimester. Women completed surveys about acculturation, acculturative stress, perceived discrimination, general perceived stress, and maternal depressive symptoms as well as the potential protective factor of Mexican cultural values.

Results—Women who experienced greater acculturative and perceived stress, but not perceived discrimination or acculturation, reported significantly elevated depressive symptoms during pregnancy. Also, women who experienced greater acculturative stress identified with a mixture of Mexican and American cultural values. However, only the Mexican cultural value of respect was protective against maternal depressive symptoms while adhering to the Anglo value of independence and self-reliance was a risk factor.

Limitations—A limitation in the study is the cross-sectional and descriptive self-report nature of the work, underscoring the need for additional research. Moreover, physiological measures of stress were not analyzed in the current study.

Conclusions—Results point to acculturative stress, above other cultural stressors, as a potential intervention target in culturally competent obstetric care. These findings have implications for maternal mental health treatment during pregnancy, which likely affects maternal-fetal

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Conflict of Interest

None of the authors report a conflict of interest

Contributors

Dr. D'Anna-Hernandez and Brenda Aleman designed the study and all authors contributed to the protocol. Ana-Mercedes Flores and Brenda Aleman managed the literature searches and performed preliminary analyses. Dr. Hernandez-D'Anna undertook the final statistical analysis and wrote the first draft of the manuscript. All authors contributed to and have approved the final manuscript.

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programming and may favorably affect perinatal outcomes in the vulnerable Mexican-American population.

Keywords

pregnancy; mother; immigrant; perinatal; mood

Maternal depression during the perinatal period is a debilitating illness which negatively influence maternal health, child development and family functioning (O'Hara and Swain, 1996). It is estimated to affect approximately 10–15% of women in the general population (O'Hara and Swain, 1996), however the rate of maternal depression in Mexican-American mothers is substantially higher, ranging from 17–59% (Beck, 2006; Heilemann et al., 2004; Zayas et al., 2002). Mexican-American women not only experience general negative life events (Zayas et al., 2002) that may contribute to depressive symptomatology in the perinatal period, but also experience a variety of cultural specific stressors that may contribute these high rates of maternal depression. These cultural stressors include acculturation, the multidimensional process of cultural and psychological change following contact between cultural groups (Sam and Berry, 2010) acculturative stress, the stressors associated with the acculturative process (Berry, 2006) and perceived discrimination, negative attitudes towards or unjust treatment of individuals of a particular group (Williams et al., 2003). However, the relative contribution of each of these factors to maternal mental health during pregnancy apart from perceived general life stress in Mexican-American women is unclear. This work aims to identify the socio-cultural correlates of maternal depression in vulnerable pregnant Mexican-American women as well as identify potential protective cultural factors. This research will add to an understanding of the risk factors that make women of Mexican descent more susceptible to negative perinatal outcomes and have implications for culturally competent care.

Mexican-American women experience high levels of general life stressors in addition to cultural stressors in the perinatal period (Beck, 2006; Heilemann et al., 2004; Zayas et al., 2002). Mexican-American mothers are more likely to be single, less educated, younger and of lower socioeconomic status than their Caucasian counterparts (Bernstein, 2007; Faisal-Cury et al., 2004; Morris-Rush et al., 2003; Rini et al., 1999), all of which are significant risk factors for maternal depression (Beck, 2006; Halbreich, 2005). Depression during pregnancy often goes undiagnosed in the general population and may be more so in the Mexican-American community where barriers to the provision of medical treatment as well as social and/or financial barriers are present (Ojeda and McGuire, 2006). In addition, pregnant Mexican-American women report less resiliency resources (i.e. self-esteem, optimism), which are associated with healthier perinatal outcomes, than Caucasian women (Rini et al., 1999). Thus, Mexican-American women may experience increased general life stressors that put them at risk for depression during pregnancy.

Mexican-Americans also experience varying degrees of cultural stressors which can adversely affect their mental health. Acculturation of Mexican immigrants in the US culture has deleterious health effects, including increased rates of cardiovascular disease, obesity, diabetes (Daviglius et al., 2012; Lara et al., 2005) and mental health disorders (Ortega et al.,

2000; Vega et al., 1998). This is especially significant at a time of greater vulnerability such as pregnancy. In the perinatal period, acculturation of women of Mexican descent is associated with low-birth weight (Beck, 2006), declines in breastfeeding (Rassin et al., 1993; Rassin et al., 1994) and an increased risk of prenatal anxiety (Campos et al., 2007) and postpartum depression in most (Heilemann et al., 2004; Martinez-Schallmoser et al., 2003), but not all studies (Beck et al., 2005; Campos et al., 2007), highlighting discord in the field. There is a need to analyze acculturation beyond the proxy measures of language and birthplace as acculturation is a multidimensional bidirectional process in which groups may modify their core beliefs as a result of cultural contact (Lara et al., 2005; Sam and Berry, 2010). In addition, given the association between acculturation with adaptation to stress (Caplan, 2007), current research focuses on acculturative stress as a more relevant potential risk factor contributing to mental health outcomes than acculturation. Acculturative stress may play a significant role beyond acculturation in risk for adverse perinatal outcomes in women of Mexican descent.

Acculturative stress refers to the stress associated with acculturative experiences and cultural adaptation (Berry, 2006). Acculturative stress draws on an individual's resources necessary for the adjustment to a new culture (Driscoll and Torres, 2013; Roysircar-Sodowsky and Maestas, 2000). For example, adopting new behaviors and customs while maintaining and/or losing those of the home culture may produce family conflict or group marginalization (Castillo et al., 2008). Previous work suggests acculturative stress is the underlying source of the adverse health consequences on the Mexican population (Crockett et al., 2007; Hovey, 2000). Little work has addressed the role of acculturative stress on maternal mental health. Early studies have found acculturative stress was positively related to depressive symptoms in late pregnancy and postpartum period in adolescent Mexican-American mothers (Zeiders et al., 2014), but not during pregnancy in an older sample (Walker et al., 2012). Thus, more work is needed to understand the direct role of acculturative stress on maternal mental health with implications for promoting healthy perinatal outcomes in the vulnerable Mexican-American population.

Discrimination is another potentially stressful phenomenon associated with adverse health outcomes (Pascoe and Richman, 2009). Recent work in Latinos suggests that depressive symptoms increase following a discriminatory experience (Torres and Ong, 2010). Other cultural stressors may be working with discrimination to exacerbate these outcomes. For example, acculturative stress mediates the relationship between discrimination and psychological stress in a largely Mexican-American sample (Torres et al., 2012). However, in pregnant Mexican-American women greater levels of discrimination along with marginalization from Anglo culture, but not acculturative stress, predicted elevated depressive symptoms in mid pregnancy (Walker et al., 2012). Further research is needed to identify the contribution of these factors to maternal depression during the first trimester of pregnancy in Mexican-American women. If identification of what in particular is stressful about cultural adaptation is determined, then potential protective factors may be uncovered. Adherence to Mexican native values, rather than the adjustment of values to match American values may serve as a protective factor against health complications for Mexican-American women (Morales et al., 2002). Identification of the roles of acculturation,

acculturative stress and perceived discrimination early in pregnancy may lead to culturally competent prenatal care in the fast-growing Mexican-American population.

The purpose of the present study was to investigate the unique influence of acculturation, acculturative stress and perceived discrimination independent from general stress as well as with general perceived stress in the model on maternal mental health in pregnant Mexican-American mothers. It was hypothesized that acculturative stress and perceived discrimination would be associated with increased symptoms of depression, over and above acculturation and general perceived stress. It was also expected that adherence to Mexican cultural values would be protective against maternal depressive symptoms during early pregnancy. Lastly, adherence to Mexican cultural values would moderate the relationship between the effects of acculturative stress and perceived discrimination on symptoms of maternal depression.

Methods

Sample

One hundred and fifteen Mexican and Mexican-American pregnant women (ages 18–45) were recruited from a local community clinic during their first trimester to complete this study. Eligibility criteria to participate in the study included being of Mexican descent, non-smoking and without current illicit drug use. Visits occurred at normally scheduled obstetrics clinic appointments between July 2012 and April 2014. The clinic is a part of a community health clinic network in which 77% of patients are racial/ethnic minorities, and half of patients are uninsured (NCHS, 2013). All participants provided informed consent and all procedures were approved by the California State University San Marcos Institutional Review Board. Four participants withdrew from the study due to a lack of available time, three participants reported miscarriages, three participants switched their care to other clinics, two participants moved away and five participants were not reachable after the initial study visit. A final sample size of 98 mothers were evaluated.

Procedure

All participants were recruited between 10–15 weeks pregnant. At the first study visit (<15 weeks gestation) participants completed self-administered surveys on all demographic variables and as well culture-related questionnaires. Women returned for an additional visit between 15–17 weeks gestation to assess mental health symptoms. All measures were offered both in Spanish and English. Measures previously validated in Spanish were used or when necessary measures were translated and then back translated by native Spanish-speaking staff.

Maternal acculturation status

Acculturation was assessed by the multidimensional Acculturation Rating Scale for Mexican Americans-Revised (ARMSA-II) (Cuellar et al., 1995). This self-report scale has been used to study birth outcomes in Latinas (Jones and Bond, 1999) and is currently the most relevant measure of acculturation (Beck, 2006). The ARMSA-II consists of the Anglo Orientation Subscale (30 items) and the Mexican Orientation Subscale (18 items). This scale has been

used to study culturally competent care during pregnancy (Jones et al., 2001) and postpartum period (Beck, 2006). In the current study, the assimilation score is reported. Participants answered on a scale from 1 (not at all) to 5 (extremely often or almost always). An example question is “My friends while I was growing up were of Anglo origin.”

Acculturative Stress

The Societal, Attitudinal, Environmental, and Familial Acculturative Stress Scale (SAFE) is a 24-item self-report scale used to assess acculturative stress. The SAFE has assessed acculturative stress in relation to depression in Mexicans (Hovey and Magaña, 2002; Shatell et al., 2008). Participants answer on a 5 point Likert scale from “Not stressful” to “Extremely stressful” and higher scores indicate more acculturative stress. For example, one of the questions states: “It bothers me that family members I am close to do not understand my new values.” The SAFE has demonstrated discriminant validity from general life stress (Kiang et al., 2010; Kroon Van Diest et al., 2014) and good reliability amongst Latinos and Mexican-Americans specifically ($\alpha = .89-.88$) (Fuentes and Westbrook, 1996; Hovey, 2000).

Perceived discrimination

The Discrimination Stress Scale (DSS) is a 14-item scale that evaluates perceived racial/ethnic discrimination in everyday life due to ethnic minority status. Participants choose from a range of responses on a 4-pt Likert Scale from 1 (never) to 4 (very often) with good internal consistency ($\alpha = .92$) (Flores et al., 2008). An example question is “How often are you treated rudely or unfairly because of your race or ethnicity?” Higher scores represent a self-report of experiencing greater racial/ethnic discrimination and are associated with increased physical and mental health symptoms among Mexican-origin adults (Flores et al., 2010) and youth (Flores et al., 2008).

General Perceived Stress

The Perceived Stress Scale (PSS) (Cohen et al., 1983; Cohen et al., 2006) is a 14-item scale that assesses stress-related feelings and thoughts during the past month. Participants answer on a 5 point Likert scale from “Never/Rarely” to “Very Often.” The PSS has been used with Latino caregivers (Gallagher-Thompson et al., 2006) and pregnant and postpartum Latinas (Mann et al., 2010). For example, one of the questions states: “How often have you felt that things were going your way?”

Mexican Cultural Values

To identify potential protective cultural factors, the Mexican American Cultural Values Scale for Adolescents and Adults (MACVS) (Knight et al., 2010) was used. This scale is composed of nine subscales, six of which assess Mexican orientation/enculturation (Familism-Support, Familism-Obligations, Familism-Referent, Respect, Religion, and Traditional Gender Roles), and three that assess Mainstream Values/Acculturation (Material Success, Independence and Self Reliance, and Competition and Personal Achievement subscales). The items are on a 5-point Likert scale that range from “Not at all agree” to “Completely Agree.” This scale has been used with families to evaluate perceptions of key

values and the underlying processes of cultural change and dual cultural adaptation (Knight et al., 2010; Roosa et al., 2010) with strong construct validity (Knight et al., 2010).

Maternal Depressive Symptoms

Maternal depressive symptoms were measured using the Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977) at the 15 to 17 weeks gestation visit. This scale contains 20 items that ask about depression symptoms in the past week on a four-point scale. After reverse scoring of several items, the score is used to assess levels of distress. A score > 16 indicates a clinically significant level of psychological distress (Radloff, 1977). The CESD has been previously used to assess depressive symptoms in low-income immigrant Mexican women (Mendenhall and Jacobs, 2012) and in pregnant Latinas (Davila et al., 2009).

Statistical Analysis

Correlations were used to determine associations of the continuous variables age, body mass index (BMI), years of education, income, and parity with acculturation, acculturative stress, perceived discrimination and maternal mental health. One-way analyses of variance (ANOVAs) were used to determine the effects of the categorical variables employment status and marital status on acculturation, acculturative stress, discrimination and maternal mental health. None of the demographic variables were associated with either acculturation or mental health (data not shown), except for maternal age and years of education and years in the US (see Results). Thus maternal age and years of education and years in the US were included as covariates in the following analyses.

To capture acculturation, acculturative stress, perceived discrimination, perceived stress and maternal depressive symptoms, all measures were evaluated as continuous variables. Acculturation, acculturative stress, perceived discrimination and cultural values were correlated to determine their relationship to one another during pregnancy. To identify the unique contribution of each cultural stressor on maternal depressive symptoms, three separate multiple linear regressions with covariates and each cultural stressor (acculturation, acculturative stress, discrimination) as the predictors of maternal depressive symptoms. To determine the model best explaining maternal mental health, one multiple linear regression analysis with maternal depressive symptoms as the dependent variable and acculturation, acculturative stress, discrimination and perceived stress all entered as independent variables was computed. An additional multiple linear regression analysis assessed the relationship between adherence to cultural values and covariates as predictor (independent) variables on maternal depressive symptoms (the dependent variable) to determine if adherence to Mexican cultural values were protective. Lastly, separate moderation interaction analyses were then conducted to determine if adherence to each cultural value moderated the relationship between acculturative stress and maternal depressive symptoms. These analyses were conducted using a commercial statistical package, SigmaStat 3.0 (SPSS Inc., Chicago).

Results

Sample characteristics

All women in this study self-identified as Hispanic/Latino and were of Mexican ancestral origin. The mean age ($\pm$ standard deviation) of mothers in this study was 27.48 ± 5.50 years. Parity ranged from 0–6 with a mean parity of ($\pm$ standard deviation) of 1.64 ± 1.42 . In addition, the mean time ($\pm$ standard deviation) women reported being in the US was 15.88 ± 7.54 years and almost 40% of sample women reported depressive symptoms over the clinical cutoff of 16 for the CESD. All other maternal demographics are included in Table 1.

Maternal age was significantly negatively correlated with acculturation (Assimilation Score on ARMSA-II) indicating that less acculturated women were more likely to be older ($r = -0.396$, $p < 0.001$; Pearson's correlation). In addition, increased acculturation was associated with spending more years in the US ($r = 0.601$, $p < 0.001$). Lastly, women who were more likely to be educated (higher years of education) were reported to have less acculturative stress ($r = -0.326$, $p = 0.001$; Pearson's correlation), more depressive symptoms ($r = -0.239$, $p = 0.018$) as well as higher acculturation levels ($r = 0.387$, $p < 0.001$). No other demographic variables were associated with other cultural or mental health variables, thus age, years of education, and years spent in the US were included as covariates in further analyses.

Relationship between maternal cultural stress variables and maternal mental health

Separate multiple linear regressions, while controlling for age, income, years of education, and years spent in the US, revealed that independently, increased acculturative stress ($R^2 = 0.248$, $\beta = 0.204$, $t = 4.853$, $p < 0.001$), perceived discrimination ($R^2 = 0.122$, $\beta = .257$, $t = 2.602$, $p = 0.011$) and perceived stress ($R^2 = 0.312$, $\beta = 0.512$, $t = 2.602$, $p < 0.001$), but not acculturation ($R^2 = 0.057$, $\beta = -0.006$, $t = -0.380$, $p = 0.970$) were related to greater levels of depressive symptoms in the first trimester.

Multiple linear regression analysis to determine if cultural stressors are related to maternal depressive symptoms with general perceived stress in the model revealed two predictors accounting for maternal depressive symptoms while controlling for covariates: acculturative and perceived stress (Table 2). Higher levels of acculturative stress and general perceived stress, but not acculturation or perceived discrimination, predicted elevated depressive symptoms.

Relationship between maternal cultural stress and protective cultural variables

Table 3 represents the correlations between the cultural stressors of acculturation (ARMSA-II), acculturative stress (SAFE), perceived discrimination (DSS) and cultural values (MACVS). Being more acculturated was associated with less adherence to the Mexican cultural value of family religion, but not with acculturative stress or perceived discrimination. Perceived discrimination was positively correlated with acculturative stress only and was not related to acculturation. Acculturative stress was also positively correlated with adherence to both the Mexican cultural values of gender roles and the Anglo cultural value of material success.

Protective cultural variables and maternal mental health

When all 9 cultural value subscales were entered together into a multiple linear regression while controlling for age, income, years in the US, none of the Anglo or Mexican cultural values predicted maternal depressive symptoms during pregnancy ($R^2 = 0.130$, $p = 0.412$).

Moderation analysis of interaction between cultural values and stressors on maternal mental health

There was a significant moderation of adherence to the Mexican cultural value of respect on the relationship between acculturative stress and depressive symptoms ($R^2 = 0.346$, $p = 0.019$; MLR), such that mothers who reported more acculturative stress and valued respect less had more depressive symptoms in early pregnancy (Figure 1).

In addition, there was a marginally significant moderation of adherence to the Anglo cultural value of independence and self-reliance on the relationship between acculturative stress and depressive symptoms ($R^2 = 0.324$, $p = 0.050$; MLR), such that mothers who reported less acculturative stress and valued independence and self-reliance reported elevated depressive symptoms (Figure 2).

Discussion

As Mexican-Americans report high levels of maternal depressive symptoms, this study aimed to delineate the roles of acculturation, acculturative stress and discrimination in maternal mental health during pregnancy in Mexican-American women. In summary, maternal depressive symptoms were associated with greater maternal acculturative stress and perceived stress, but not acculturation or perceived discrimination. These factors were also associated with a constellation of Anglo and Mexican cultural values. However, adherence to Mexican cultural values protected against the negative effects of acculturative stress on maternal depression whereas adherence to Anglo cultural values increased the risk of depressive symptoms. This work suggests that acculturation to mainstream culture poses risks for the mother/child dyad during pregnancy that may be driven by acculturative stress in Mexican-American women. Identification of protective cultural practices could promote healthier maternal outcomes for vulnerable populations.

Maternal depressive symptoms were adversely affected by cultural stressors in the current study. However, when considered together, the greatest impact on maternal depressive symptoms early in pregnancy was realized by a combination of acculturative and perceived stress. This is one of the first studies to consider the effects of acculturative stress as a unique stressor apart from perceived stress on maternal mental health. Acculturative stress has been related to adverse mental health outcomes in a variety of other populations, including farmworkers (Hovey, 2000) and in other races and ethnicities (Kroon Van Diest et al., 2014; Sirin et al., 2013). However, acculturation was not found to affect maternal depressive symptoms in the current study. There is a discord in the perinatal research in regards to the relationship between acculturation and perinatal outcomes likely due to the inconsistent measurement of acculturation. Studies that use proxy measures of acculturation such as language preference, generation status, length of US residence and birthplace often

present conflicting results in relation to birth outcomes (English et al., 1997; Guendelman and English, 1995), including maternal depression (Beck et al., 2005; Heilemann et al., 2004; Martinez-Schallmoser et al., 2003). For example, postpartum depression was elevated in Mexican born women who spent their childhoods in the US, however birthplace was not related to depression (Heilemann et al., 2004). Unlike acculturative stress, these proxy measurements of acculturation do not take into account the individuals' perception of self-acculturation or their perceptions of the stresses associated with adaptation between two cultures.

While discrimination during pregnancy is associated with adverse perinatal outcomes in mixed race minority populations (Bennett et al., 2010; Earnshaw et al., 2013), the current study showed that discrimination is also a risk factor for elevated maternal depressive symptoms in pregnant Mexican American women in particular. However, when acculturative stress was included in the model, only acculturative stress remained predictive of maternal depressive symptoms. This work points to acculturative stress as a more potent psychosocial risk factor for maternal mental health than discrimination. Though discrimination and acculturative stress are different concepts (Dawson and Panchanadeswaran, 2010), it is possible that discrimination may contribute to acculturative stress (Dawson and Panchanadeswaran, 2010; Finch et al., 2001). Furthermore, in the Mexican-American population, the adverse effects of discrimination on both physical (Finch et al., 2001) and mental (Torres et al., 2012) health have been shown to occur via acculturative stress. Together this work highlights the potential role of acculturative stress as a mechanism by which discriminatory experiences may adversely affect behavioral and mental health, emphasizing the need to address acculturative stress in culturally sensitive obstetric care.

As conflicts in cultural values likely play a large role in cultural adaptation and thus acculturative stress, the contribution of Anglo and Mexican cultural values to cultural stressors were evaluated in the current study. Acculturative stress in particular was associated with adherence to both Mexican and Anglo values, such as gender roles and material success, respectively. The Mexican value of gender roles refers to the traditional ideas that young females need more protection and supervision than males or traditional males vs. females roles within a family regarding childcare (Knight et al., 2010). These ideas are reflected in the MACVS in the sample example item "Men should earn most of the money for the family so women can stay home and take care of the children and the home" (Knight et al., 2010). Such traditional gender roles are suggested to underlie Mexican orientation and contribute to coping strategies (Villarruel et al., 2009). However, acculturation coupled with strong Mexican identity has been shown to be associated with marital conflict for Mexican women (Flores et al., 2004; Negy and Snyder, 1997, 2007) likely related to power struggles over traditional roles (Casas and Ortiz, 1985; Flores et al., 2004). Thus, it may be acculturative stress is related to redefining marital expectations and gender roles while attempting to maintain tradition. As beliefs, actions, social pressures and expectations may not align in acculturated individuals and differ across generations (Su et al., 2010), this conflict could be contributing to psychological distress in Mexican-American mothers. On the other hand, the Anglo value of material success refers to prioritizing of earning money or measurable success in terms of goods. For example, a sample question

would be “Money is the key to happiness.” Financial and material successes are often viewed as common acculturative pressures (Gans, 2006; Samnani et al., 2013). Previous work suggests those who acculturate might consider economic prosperity and collection of material goods as marks of success in US culture (Knight et al., 2010) and/or be more likely to assimilate (Samnani et al., 2013). However, even if valued, not having material goods and being of low socioeconomic status has been linked to an increase of mental health disorders (Muntaner et al., 2004). Thus one that values material goods, but may not yet be able to reach this goal, may experience higher levels of psychological and acculturative stress.

Identification with cultural values may buffer the effects of cultural stressors on mental health symptoms during pregnancy. A traditional value, respect, was protective in the current study in the relationship between acculturative stress and maternal depressive symptoms. The MACVS respect subscale refers to intergenerational respect and mainly children’s respect for their parents. A sample item is “Children should always be polite when speaking to any adult” (Knight et al., 2010). Respect in this case may contribute to familism defined as the traditional view of obligation, loyalty and dedication to family members (Sabogal et al., 1987). Familism has been shown to buffer against depressive symptoms in parents and is related to strong social support (Hayden et al., 2013; Ornelas and Perreira, 2011). Social support in the Mexican-American population may serve as a useful coping strategy against cultural values. For example, in Mexican-American youth with more Anglo orientation, social support buffered against the negative effects of discrimination on mental health (Brittian et al., 2013). Conversely, in the current study, the Anglo value of independence and self-reliance placed lower acculturated individuals at risk of elevated maternal depressive symptoms. Independence and self-reliance are considered individualistic values that are high amongst Americans (Morling and Lamoreaux, 2008; Oyserman et al., 2002). Though independence and self-reliance can be associated with resilience (Moorhouse and Calabiano, 2007), in the traditionally collectivistic Mexican culture, these Anglo values may be associated with less support and place individuals at risk for mental health issues during the perinatal period. For example, postpartum women of Mexican descent who reported high levels of independence and self-reliance also exhibited elevated maternal depressive symptoms (Heilemann et al., 2004). Thus, perhaps those who identify with traditional Mexican cultural values may have increased levels of social support or traditional coping styles that may buffer against the effects of maternal depression.

While this study points the importance of acculturative stress in maternal depressive symptoms, there were limitations to the current study. First, depressive symptoms in the current study were only collected once during early in pregnancy. Work has suggested that depressive symptoms both change and are stable during pregnancy and often decrease in the postpartum period (Dipietro et al., 2008; Heron et al., 2004). In addition, this may vary depending on population, thus further longitudinal analysis of depressive symptoms in the Mexican-American population overtime may pinpoint when during pregnancy acculturative stress may most adversely affect maternal depressive symptoms. In addition, the sample size was relatively small (n=98) and more participants could have shed light on the role of cultural stressors on maternal mental health. Lastly, the current study consisted of self-report data alone (maternal depression and cultural stressors). The investigation of physiological mechanisms related to depression (cortisol, inflammation) could have added more validity to

the study. However, useful information regarding the relationship between acculturative stress and the buffering effects of Mexican cultural values on maternal depressive symptoms was gained.

This study points to acculturative stress along with general perceived stress and other cultural stressors as significant risk factors for adverse maternal mental health symptoms in pregnant Mexican-American women. Assessment of information related to acculturative stress may provide a means for assessing risk for perinatal outcomes in this vulnerable population. In addition, identification with traditional Mexican cultural values may promote advantageous coping skills or highlight social networks relevant to combat against depressive symptoms during pregnancy. Further work should investigate the specific stressors of acculturative stress as well as the physiological mechanisms by which this may be affecting the mother/child dyad in the vulnerable Mexican-American population. Assessment of acculturation status during the perinatal period may inform culturally based interventions optimizing perinatal outcomes in Mexican-American women. In addition, traditional cultural values may provide a useful intervention point for culturally competent mental health care during pregnancy.

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Figure 1.

Interaction between acculturative stress and Mexican cultural values. In early pregnancy, there was a significant interaction between acculturative stress levels and Mexican cultural value of respect on maternal depressive symptoms ($R^2 = 0.346$, $p = 0.019$; MLR). Maternal depressive symptoms were elevated when acculturative stress was high and the Mexican cultural value of respect was low. For graphical representation only, dichotomous categories of levels of acculturative stress levels and cultural values were created via median splits.

Figure 2.

Interaction between acculturative stress and Anglo cultural values. In early pregnancy, there was a marginally significant interaction between acculturative stress levels and the Anglo cultural values of independence and self-reliance on maternal depressive symptoms ($R^2=0.324$, $p=0.050$; MLR). Maternal depressive symptoms were low when both acculturative stress and the Anglo cultural value of independence and self-reliance were low. For graphical representation only, dichotomous categories of levels of acculturative stress levels and cultural values were created via median splits.

Table 1

Maternal characteristics

Characteristic	N	%
Age		
19	9	9.2
20–29	56	57.2
30–39	31	31.6
40	2	2.0
Employment status		
Unemployed	53	54.1
Part-time	29	29.6
Full-time	16	16.3
Years of education		
<12	39	39.8
12	50	51.0
>12	9	9.2
Marital status		
Married	32	32.7
Living together, not married	42	42.9
Not living together, not married	21	21.4
Separated	3	3.0
Family Income		
<\$10,000	4	4.1
\$11,000–\$20,000	28	28.6
\$21,000–\$30,000	39	39.8
\$31,000–40,000	14	14.3
>\$41,000	13	13.2
CESD score		
<16	59	60.2
>16	39	39.8
Parity		
Primiparous	12	12.3
Multiparous	86	87.7

Table 2

Variables identified by multiple linear regression analysis as explaining maternal depressive symptoms (CESD) early in pregnancy (n=98).

Predicted variable	R ²	Explanatory variables	Standard coefficient*	t	Sig* (p)
CESD	.386	Maternal age	0.100	0.941	0.349
		Years in the US	−0.035	−0.301	0.764
		Income	−0.142	−1.417	0.160
		Acculturation	0.059	0.471	0.639
		Perceived Discrimination	0.090	1.004	0.318
		Perceived Stress	0.394	4.274	<0.001
		Acculturative Stress	0.267	2.629	0.010

Bold indicates significant predictor variable, p<0.05.

Table 3

Correlations between cultural stressors and cultural values

Variables	SAFE	DSS	ARMSA
1. Acculturative Stress (SAFE)	1	0.380***	−0.159
2. Perceived Discrimination (DSS)	0.380***	1	−0.031
4. Acculturation (ARMSA)	−0.159	−0.031	1
5. Family Support	0.143	0.001	0.028
6. Family Obligations	0.153	−0.033	0.042
7. Family Referent	0.112	−0.166	−0.052
8. Respect	0.136	−0.063	0.147
9. Religion	0.128	0.050	−0.339*
10. Gender Roles	0.393***	0.061	−0.126
11. Material Success	0.312*	−0.013	−0.046
12. Independence & Self-reliance	0.151	0.084	0.109
13. Competition & personal achievement	0.177 [†]	−0.023	−0.172

[†]p=0.07,

*p<0.05,

**p<0.001