Original Article

Household food insecurity is associated with depressive symptoms among low-income pregnant Latinas

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Abstract

Latinas experience high rates of poverty, household food insecurity and prenatal depression. To date, only one USA study has examined the relationship between household food insecurity and prenatal depression, yet it focused primarily on non-Latina white and non-Latina black populations. Therefore, this study examined the independent association of household food insecurity with depressive symptoms among low-income pregnant Latinas. This cross-sectional study included 135 low income pregnant Latinas living in Hartford, Connecticut. Women were assessed at enrolment for household food security during pregnancy using an adapted and validated version of the US Household Food Security Survey Module. Prenatal depressive symptoms were assessed using the Center for Epidemiological Studies Depression Scale. A cut-off of ≥21 was used to indicate elevated levels of prenatal depressive symptoms (EPDS). Multivariate backwards stepwise logistic regression was used to identify risk factors for EPDS. Almost one third of participants had EPDS. Women who were food insecure were more likely to experience EPDS compared to food secure women (OR = 2.59; 95% CI = 1.03–6.52). Being primiparous, experiencing heartburn and reporting poor/fair health during pregnancy, as well as having a history of depression were also independent risk factors for experiencing EPDS. Findings from this study suggest the importance of assessing household food insecurity when evaluating depression risk among pregnant Latinas.

Keywords: depression, food insecurity, Hispanic, Latina, pregnancy.

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Introduction

Prenatal depression is a growing concern in the United States. Between 2 and 21% of pregnant women are diagnosed with major depression and 8–31% are estimated to experience elevated levels of depressive symptoms (Bennett *et al.* 2004). Pregnant women with low socio-economic status (SES) are disproportionately affected. Up to 38% of pregnant women with low SES have been found to suffer from major depression and up to 51% experience elevated levels of depressive symptoms (Bennett *et al.* 2004). Among pregnant women with low SES, ethnic/racial disparities in the prevalence of depression symptoms have been documented. Low-income pregnant Latinas experience higher rates of prenatal depressive symptoms compared to non-Latinas whites (Jesse & Swanson 2007) and similar rates compared with African Americans (Zayas *et al.* 2002; Jesse & Swanson 2007).

Few studies have examined the determinants of prenatal depression among Latinas. In addition to poverty, other risk factors for elevated prenatal depressive symptom levels that have been documented among pregnant Latinas include not having a partner (Davila *et al.* 2009), having a history of depression/suicidal thoughts (Lara *et al.* 2009), more stress (Jesse & Swanson 2007), unplanned and unwanted pregnancy (Rich-Edwards *et al.* 2006), young maternal age (Rich-Edwards *et al.* 2006) and lack of social support (Robertson *et al.* 2004; Rich-Edwards *et al.* 2006). Acculturation (Davila *et al.* 2009), defined as 'the process by which immigrants adopt the attitudes, values, customs, beliefs, and behaviors of a new culture' (Abraido-Lanza *et al.* 2004), and education (Lara *et al.* 2009) have been cited as potential risk factors; however, results from various studies have been inconsistent.

Household food insecurity, defined as the limited ability to acquire nutritionally adequate and safe foods in socially acceptable ways (Anderson 1990), has also been linked with depressive symptoms in several published studies (Whitaker *et al.* 2006; Huddleston-Casas *et al.* 2009; Lent *et al.* 2009). The majority of evidence associating household food insecurity and maternal mental health status, including depression, has been conducted among non-pregnant populations (Whitaker *et al.* 2006; Huddleston-Casas *et al.* 2009; Lent *et al.* 2009). Only one study has examined the relationship between household food insecurity and depressive symptoms among a sample of pregnant women in the United States (Laraia *et al.* 2006). That cross-sectional study included predominately non-Latina white and non-Latina black pregnant women from households at or below 400% of the poverty line living in North Carolina (Laraia *et al.* 2006). Psychological factors including depression, perceived stress and anxiety were found to be associated with household food insecurity in a dose-response relationship, showing that symptoms increased as food insecurity status worsened (Laraia *et al.* 2006). Independent of other psychological factors, prenatal depression was also found to be a strong predictor of household food insecurity among this sample.

Proper nutrition during pregnancy is vital to promoting optimal fetal development during pregnancy. Lower intakes of green leafy vegetables and fruits (Rao *et al.* 2001; Mikkelsen *et al.* 2006) as well as caloric and protein restriction (Kramer & Kakuma 2003) have been associated with suboptimal birth weights. Food insecurity has been linked to poorer dietary quality, with severe levels being linked to reductions in caloric intake. Among pregnant women, food insecurity has been associated with an increased risk of certain birth defects, including spina bifida and anencephaly (Carmichael *et al.* 2007), and has been shown to increase the likelihood of delivering a low birthweight infant (Borders *et al.* 2007). Examining food insecurity in the context of elevated prenatal depression symptoms is an important step towards understanding the psycho-emotional dimension of food insecurity during pregnancy. Therefore, the purpose of this study was to examine the association between household food insecurity and elevated levels of prenatal depressive symptoms among low-income pregnant Latinas. This study is highly relevant because Latina households living below the poverty line are at high risk for food insecurity (Nord *et al.* 2009). Latinas experience rates of household food insecurity almost twice as high as the national level (Nord *et al.* 2009), with rates as high as 46% being reported among pregnant Latinas (Herman *et al.* 2004).

Key messages

- The risk of experiencing elevated levels of prenatal depressive symptoms was significantly higher among food insecure pregnant Latinas compared to those who were food secure.
- Improving household food security can help women achieve proper nutrition and positive psycho-emotional health during pregnancy.
- Assessing household food insecurity can be an important step for health professionals to take when evaluating prenatal depression risk among pregnant Latinas.

Materials and methods

This study is based on analyses of baseline data from a prospective study conducted in Hartford, Connecticut, USA, from September 2005 through May 2007 evaluating household food insecurity, meal skipping, dietary intake patterns and pregnancy outcomes among low-income Latinas. The prospective study consisted of two prenatal interviews, a post-partum interview, and the review of delivery as well as birth medical records. Participants were recruited from local agencies and programmes including: maternal and infant service programmes (16.3%), other programmes and activities from a local community agency (13.2%), the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) (47.3%), an area hospital (2.3%), community clinics (1.6%), supermarkets and restaurants (3.9%), street and phone outreach (8.5%), elementary schools (1.6%) and friend/family referrals (5.4%). Women were eligible and invited to participate in the study if they were: (1) self-identified as Latina, (2) 4–8 months pregnant, (3) living in the Hartford area, (4) 18 years of age or older, (5) participating in WIC or eligible for WIC (i.e. household income ≤185% of the poverty level), (6) planning to deliver at one of the two city hospitals and (7) were not living in temporary housing at the time of the study.

Prior to administration of the baseline survey, eligible women were read the consent forms in their language of preference (English or Spanish) by trained bilingual, bicultural interviewers from the target community. Women that signed the consent form were enrolled in the study and given a copy to keep for their records. After obtaining informed consent, a baseline prenatal survey was administered in either English or Spanish. The prenatal survey collected data on socio-demographic characteristics (such as age, parity, marital status, income, food assistance participation, education and Latina sub-ethnicity), health (such as self-reported health status before and during pregnancy, self-reported history of physician diagnosed physical and mental health problems including depression, the presence of heartburn during pregnancy), accultura-

tion indicators (such as time lived in the United States, country of birth, language of preference), dietary intake, pregnancy intentions, current smoking status, drug/alcohol use, pre-pregnancy weight, weight gain knowledge and beliefs, infant feeding beliefs, depression symptoms and household food insecurity.

Household food insecurity was assessed using a 15-item adapted and validated version of the original 18-item US Household Food Security Survey Module for pregnant Latinas (Hromi-Fiedler *et al.* 2009a,b). The timeframe covered was the month before the baseline survey. Households were considered food secure if they did not answer affirmatively to any questions. Those who responded affirmatively to any questions were classified as food insecure. (Bickel *et al.* 2000)

Prenatal depressive symptoms were assessed using the Center for Epidemiological Studies Depression Scale (CES-D) (Radloff 1977). The CES-D is a 20-item questionnaire that asks participants to report the number of days in the past week that they had been experiencing specific symptoms such as being fearful or feeling lonely. A 4-point response scale is used to evaluate the frequency of each symptom (less than 1 day = 0; 1–2 days = 1; 3–4 days = 2 and 5–7 days = 3). Four questions are reverse scored. The response values are summated, with total scores ranging from 0 to 60. The CES-D has been validated with multiethnic samples including Mexican Americans (Roberts 1980). Studies have used a cut-off point of ≥16 to indicate high levels of depressive symptoms (Lara *et al.* 2009). Since some of the symptoms of depression are also characteristics of pregnancy (i.e. changes in appetite, fatigue), studies conducted among pregnant Latinas have used higher cut-off points (Davila *et al.* 2009). This study used a cut-off of ≥21, as recommended by Davila *et al.* (2009), to indicate elevated levels of depressive symptoms within our population.

A protocol was developed by a bilingual, bicultural licensed social worker to assist interviewers in identifying participants' risk of severe depression and refer them to bilingual mental health resources. Human Subjects Committees from the University of Connecticut, Hartford Hospital, Saint Francis Hospital

and Medical Center and the Hispanic Health Council approved this study.

Of the 138 participants that completed the baseline prenatal survey, three did not respond to the CES-D questions and thus were excluded from these analyses.

The Statistical Package for the Social Sciences (SPSS) for Windows (version 15.0) was used for univariate, bivariate and multivariate analyses. Bivariate correlations, chi-square and *t*-test analyses were conducted to examine the associations between elevated level of prenatal depressive symptoms (cutoff ≥21) and household food insecurity (food insecure vs. food secure), demographic characteristics, socio-economic factors, perceived health measures (self-reported health during pregnancy and presence of heartburn during pregnancy), pre-gravid BMI, smoking status, drug/alcohol use and depression history. Factors that were associated with elevated prenatal depressive symptoms at the $P \leq 0.10$ level in the bivariate analyses were included in the backwards stepwise regression model. Odds ratios (OR) and the corresponding 95% confidence interval (CI) were reported for logistic regression analyses. Findings were considered significant if they excluded the value of 1.0. Marginally significant findings included the value of 1.0 with a *P*-value ≤0.1. The goodness-of-fit of the logistic regression model was assessed with the Hosmer-Lemeshow test. Correlations between variables (Table 1) indicated that only a few were weakly related, suggesting that multi-collinearity was not a factor in the model.

Results

Participants were on average 25 years old, had lived in the United States longer than 11 years, lived in four-member households, and had three people supporting them during their pregnancy (Table 2). More than two-thirds of participants were multi-parous and enrolled in the WIC programme. Almost two-thirds of participants had been recruited in their second trimester of pregnancy, had less than a high school education and were of Puerto Rican descent. Over half were bilingual, did not have a partner, and reported household participation in the Supplemental Nutri-

Table I. Correlation matrix among independent variables[†]

Variables	Household food security	Parity	Heartburn	Health	Hx of depression	Latina subgroup	Marital status	SNAP participation
Household food security	–							
Parity	0.003	–						
Heartburn	0.059	-0.126	–					
Health	0.081	0.124	0.075	–				
Hx of depression	-0.027	-0.109	0.137	0.072	–			
Latina subgroup	0.029	-0.027	-0.157	0.090	-0.143	–		
Marital status	0.098	-0.125	0.141	0.008	0.118	-0.318**	–	
SNAP participation	0.015	0.162	-0.250**	0.064	-0.121	0.496**	-0.218*	–
Social support	0.091	-0.081	0.076	0.142	0.190*	-0.088	0.164	-0.166

*Significant correlation at $P \leq 0.05$; **Significant correlation at $P \leq 0.01$; [†]Spearman correlation was used. Variables were coded as: Household food security (food insecure = 0/food secure = 1); Parity (primiparous = 0/multiparous = 1); Heartburn (yes = 0/no = 1); Health (poor or regular = 0/good, very good or excellent = 1); Hx of depression (yes = 0/no = 1); Latina subgroup (other Hispanic Latina = 0/Puerto Rican Latina = 1); Marital status (no partner = 0/partner = 1); Social support was a continuous variable.

Table 2. Participant demographic, socioeconomic, and health characteristics for the whole sample and by depression status

Characteristics	Whole sample ($N = 135$)		Levels of depressive symptoms				P value[†]
			None/low level ($n = 93$)		Elevated* ($n = 42$)		
	N	Mean (SD)	n	Mean (SD)	n	Mean (SD)	
Maternal age, y	135	25.24 (5.65)	93	25.65 (5.76)	42	24.36 (5.36)	0.221
Amount of time lived in U.S., y	134	11.65 (9.45)	93	12.29 (10.04)	41	10.19 (7.89)	0.196
Household size, including participant	134	4.01 (1.76)	92	3.92 (1.67)	42	4.19 (1.95)	0.418
# of people giving support during pregnancy	135	3.02 (1.16)	93	3.19 (1.08)	42	2.64 (1.27)	0.010
	N	%	n	%	n	%	P value[‡]
Latina subgroup							
Non-Puerto Rican Latina	47	34.8	37	78.7	10	21.3	0.071
Puerto Rican	88	65.2	56	63.6	32	36.4	
Pregnancy trimester							
2nd	87	64.9	62	71.3	25	28.7	0.376
3rd	47	35.1	30	63.8	17	36.2	
Parity							
Primiparous	40	29.6	23	57.5	17	42.5	0.064
Multiparous	95	70.4	70	73.7	25	26.3	
Education							
Less than high school	83	63.8	59	71.1	24	28.9	0.392
High school or greater	47	36.2	30	63.8	17	36.2	
WIC participation							
Yes	113	83.7	80	70.8	33	29.2	0.278
No	22	16.3	13	59.1	9	40.9	
SNAP participation[§]							
Yes	77	57.0	48	62.3	29	37.7	0.058
No	58	43.0	45	77.6	13	22.4	
Marital status							
No partner	69	51.1	42	60.9	27	39.1	0.040
Partner	66	48.9	51	77.3	15	22.7	
Language preference							
English	4	3.0	2	50.0	2	50.0	0.389
Spanish	56	41.8	42	75.0	14	25.0	
Both	74	55.2	49	66.2	25	33.8	
Insurance status							
Uninsured	46	34.1	35	76.1	11	23.9	0.194
Insured	89	65.9	58	65.2	31	34.8	
Self-reported health during pregnancy							
Poor/fair	42	31.6	19	45.2	23	54.8	0.000
Good/very good/excellent	91	68.4	72	79.1	19	20.9	
Wanted pregnancy intentions							
Unwanted	44	33.3	27	61.4	17	38.6	0.234
Wanted	88	66.7	63	71.6	25	28.4	
Planned pregnancy intentions							
Unplanned	88	66.7	59	67.0	29	33.0	0.692
Planned	44	33.3	31	70.5	13	29.5	
Heartburn during pregnancy							
Yes	92	68.1	56	60.9	36	39.1	0.003
No	43	31.9	37	86.0	6	14.0	
Pregravid BMI							
Underweight	7	5.6	6	85.7	1	14.3	0.642
Normal weight	48	38.7	31	64.6	17	35.4	
Overweight	43	34.7	31	72.1	12	27.9	
Obese	26	21.0	17	65.4	9	34.6	
Smoking at enrolment							
Yes	16	11.9	9	56.3	7	43.8	0.245
No	119	88.1	84	70.6	35	29.4	
History of depression							
Yes	18	13.3	7	38.9	11	61.1	0.003
No	117	86.7	86	73.5	31	26.5	
Alcohol use during pregnancy							
Yes	4	3.0	1	25.0	3	75.0	0.056
No	130	97.0	91	70.0	39	30.0	
Household food insecurity							
Food insecure	49	36.8	29	59.2	20	40.8	0.057
Food secure	84	63.2	63	75.0	21	25.0	

CES-D, Center for Epidemiological Studies Depression Scale; SNAP, Supplemental Nutrition Assistance Program; WIC, Special Supplemental Nutrition Program for Women, Infants, and Children; *Indicated by a value of ≥21 on the CES-D; [†]Student *t*-tests were conducted to determine differences between groups; [‡]Chi square analyses were conducted to determine differences between groups; [§]Individuals below 130% of the poverty level are eligible and enrollees receive cash assistance for food support.

tion Assistance Program (SNAP). Almost one-third of participants were uninsured, reported their health during pregnancy as poor or fair and reported the current pregnancy as unwanted. Over two-thirds had not planned their current pregnancy and reported experiencing heartburn during pregnancy. Almost 56% of participants were overweight or obese before pregnancy. Nearly 12% reported currently smoking, 13% reported a history of depression and 3% reported drinking alcohol during pregnancy. Almost 37% of participants reported experiencing household food insecurity during the month prior to the baseline survey.

Ninety-nine per cent of participants reported experiencing at least one depressive symptom in the week prior to the baseline survey. Severity ranged from 1 to 47 with 31% reporting elevated levels of depressive symptoms (CES-D $\geq$ 21). Bivariate results showed that participants were more likely to experience elevated levels of depressive symptoms (EPDS) if they: did not have a partner, experienced heartburn during pregnancy, reported being in poor or fair health during pregnancy, had a history of depression and had fewer people supporting them. Participants

of Puerto Rican descent, primiparous, or reported household participation in the SNAP programme tended to be more likely than their counterparts to experience EPDS. Participants who experienced food insecurity in the month prior to the baseline survey tended to be more likely than those who were food secure to report EPDS. Finally, participants who reported drinking alcohol during pregnancy also tended to be more likely than those who did not drink during pregnancy to report EPDS, however, since the sample size of women who reported drinking alcohol was very small ($n = 4$), this variable was not included in the multivariate logistic regression model.

Multivariate logistic regression results showed that for five of the six variables, the risk increased when covariates were added to the model. Additional analyses indicated that this was due to the distribution pattern of the covariate risk factors within each of the variables (data not shown). In the adjusted model, the odds of the participant experiencing EPDS in the week preceding the baseline survey were 2.6 higher among those experiencing food insecurity than those who were food secure (Table 3). Women who were primiparous were at higher risk of having EPDS than

Table 3. Unadjusted and adjusted odds ratios for factors associated with elevated levels of prenatal depressive symptoms*

	Unadjusted			Adjusted		
	N	OR	95% CI	N	OR	95% CI
Household food security						
Food insecure	49	2.07	0.97–4.40	48	2.59	1.03–6.52
Food secure	84	1.00		83	1.00	
Parity						
Primiparous	40	2.07	0.95–4.50	38	3.78	1.39–10.27
Multiparous	95	1.00		93	1.00	
Heartburn during pregnancy						
Yes	92	3.96	1.52–10.34	88	4.56	1.45–14.30
No	43	1.00		43	1.00	
Self-reported health during pregnancy						
Poor/fair	42	4.59	2.08–10.11	40	5.24	2.03–13.57
Good/very good/excellent	91	1.00		91	1.00	
History of depression						
Yes	18	4.36	1.55–12.25	18	5.04	1.45–17.55
No	117	1.00		113	1.00	
Latina subgroup						
Non-Puerto Rican Latina	47	0.47	0.21–1.08	44	0.40	0.14–1.15
Puerto Rican	88	1.00		87	1.00	

OR, odds ratio; CI, confidence interval; *Backward stepwise logistic regression. Variables eliminated from the model were marital status, SNAP enrolment status, social support. Hosmer-Lemeshow fitness *P*-value = 0.453 (chi-square = 7.80, d.f. = 8).

those who were multi-parous. Women who had heartburn during pregnancy and women who reported their health as being poor or fair during pregnancy were more likely to experience EPDS. A history of depression was a strong risk factor for experiencing EPDS. Finally, the odds of experiencing EPDS were 60% lower if the participant was not of Puerto Rican descent. Although this last finding was marginally significant in the multivariate logistic regression analyses, it remained in the final model as a contributing covariate.

Variables that were significant in the bivariate analyses but that did not remain in the multivariate model were: marital status, SNAP participation and social support. Each step of the backward elimination logistic regression procedure was analyzed closely to ensure the robustness of the analytical process. There were three elimination steps. In the first step, marital status ($P = 0.574$) was eliminated. In the second step, SNAP participation was eliminated ($P = 0.362$). In the third step, social support was eliminated ($P = 0.244$). In all instances, the variables eliminated had, by far, the highest P value and eliminating them did not affect the overall fit of the model at each step. Thus, the backward elimination process was found to be very robust.

Discussion

Few published studies have examined food insecurity among pregnant women (Herman *et al.* 2004; Bitler *et al.* 2005; Laraia *et al.* 2006; Borders *et al.* 2007; Carmichael *et al.* 2007), with only one focusing on the association between household food insecurity and mental health, including depression. To our knowledge, our study is the first to examine the association between household food insecurity and depressive symptoms among pregnant Latinas.

Findings from this study suggest that household food insecurity is an important risk factor for elevated prenatal depressive symptoms among low-income Latinas. Previous qualitative research we conducted with the target population found that food insecurity contributes to maternal stress during pregnancy (Hromi-Fiedler *et al.* 2009b). Food insecure pregnant women worry about having enough food to feed themselves, their unborn children, and their family

(Hromi-Fiedler *et al.* 2009b). Food insecurity can force a pregnant woman to make heartbreaking choices between feeding herself and her unborn child or feeding her family (Hromi-Fiedler *et al.* 2009b). The stress of constrained economic resources and subsequent limited access to food could contribute to feelings of helplessness and distress during pregnancy, symptoms of depression. Since maternal depression has been found to be associated with stress during pregnancy (Woods *et al.* 2009), the link between household food insecurity and depression may be explained by the increased stress created by lack of money and limited access to food during pregnancy.

Chronic health problems, including heartburn, have been linked to poorer quality of life and mental health problems including depression (Pacini *et al.* 2005). The mechanism by which heartburn leads to depression is not clear, however, heartburn has been shown to lead to sleep problems (Pacini *et al.* 2005) and vital exhaustion (i.e. symptoms of fatigue, irritability and demoralization) (Naliboff *et al.* 2004), which could affect mood, appetite and behaviours subsequently leading to elevated levels of depressive symptoms.

Most studies conducted in the United States on depression among pregnant Latinas have focused on Mexican Americans (Davila *et al.* 2009; Lara *et al.* 2009), with only a few focusing on other Latina subgroups (Zayas *et al.* 2002, 2003), and none of them comparing Latina subgroups. Our findings that Puerto Rican Latinas tended to be more likely to experience elevated levels of depressive symptoms compared with non-Puerto Rican Latinas deserves discussion due to the effect size of the association and the unique nature of the results. The difference in prenatal depressive symptom risk between Latina subgroups in our sample may be due to acculturative stress. We conducted additional analyses between Puerto Rican Latinas and non-Puerto Rican Latina subgroups (not shown) using accepted proxy indicators of acculturation including country of birth (USA vs. non-USA born), amount of time lived in the United States and language preference (English, Spanish, both), which showed that Puerto Rican Latinas in our sample were more acculturated than non-Puerto Rican Latinas. Other studies conducted

among foreign-born and USA-born Mexicans have linked higher acculturation to elevated levels of prenatal depressive symptoms (Davila *et al.* 2009); therefore, among our sample acculturative stress appears to be a reasonable explanation.

There were some limitations to this study. The cross-sectional nature of our data did not enable us to disentangle the direction of the association between household food insecurity and prenatal depressive symptoms. Consistent with published findings (Whitaker *et al.* 2006; Huddleston-Casas *et al.* 2009; Lent *et al.* 2009), we examined household food insecurity as a risk factor for elevated prenatal depressive symptoms. Qualitative research has shown that depression inhibits employment seeking behaviours that can subsequently worsen food security status (Lent *et al.* 2009). The bidirectional nature of the relationship between household food insecurity and depression can only be disentangled through prospective studies. To date, only one study has examined the bidirectionality of the relationship between household food insecurity and depression, yet this was conducted among non-pregnant women (Huddleston-Casas *et al.* 2009). Therefore, prospective studies are needed among pregnant women to understand better the bidirectional relationship between household food insecurity and prenatal depression.

The sample size in our study had enough statistical power to detect a significant relationship between household food insecurity, primiparity, heartburn during pregnancy, poor/fair health during pregnancy and a history of depression with elevated prenatal depressive symptoms. A larger sample size may have found other factors significantly associated with elevated prenatal depressive symptoms that were not able to be detected in our study due to a small sample size. Thus, null findings need to be interpreted with caution.

Finally, this study was conducted among a population of predominately pregnant Puerto Rican Latinas living in the Hartford area of Connecticut. Statistics from national studies indicate that more than 65% of Latinas in the United States are of Mexican descent, while 9% are of Puerto Rican descent (USA Census Bureau 2006). Therefore, findings from this study can only be generalized to other populations of pregnant Latinas that have characteristics similar to those in this study.

The findings from this study have important implications for health care professionals. Prenatal depression has negative consequences for maternal health, birth outcomes, as well as infant health and development. Prenatal depression has been linked to adverse maternal behaviours during pregnancy including alcohol use, drug use, smoking and low gestational weight gain (Zuckerman *et al.* 1989). Pregnant women with prenatal depression are at risk for developing pre-eclampsia, delivering pre-term and having a low birthweight infant (Steer *et al.* 1992). These women also are more likely to experience post-partum depression and exhibit poor maternal-infant interactions leading to subsequent child behavioural problems. Assessing household food insecurity during prenatal visits using a valid measure such as the 15-item adapted version of the US Household Food Security Survey Module (Hromi-Fiedler *et al.* 2009a,b) can be an important first step for health professionals to take to ensure low-income pregnant women are provided with information that would help improve their household food insecurity situation. Health professionals can also ensure that these women leave their early prenatal visits with the paperwork and guidance needed to help them enrol in WIC during pregnancy. Providing low-income, WIC eligible women with the information needed to enrol in WIC during pregnancy will increase the chances that women will have more access to healthy foods during pregnancy, thus buffering food insecurity (Herman *et al.* 2004). Household food insecurity is indeed an important contributor to sub-optimal maternal, infant and child mental and physical health during the lifecycle, especially among vulnerable groups such as low-income Latinas. Ensuring food insecure women are identified and helped during pregnancy could improve maternal mental health, subsequently leading to healthier mental and physical health outcomes for women and their children.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

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