

## Depressive Symptoms and Obesity/Weight Gain Factors Among Black and Hispanic Pregnant Women

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### Abstract

This study examined the relationships between depressive symptoms and obesity/weight gain factors in 56 Black and Hispanic pregnant women and the differences in these variables between the two ethnic groups. Of the women, 32% were likely depressed, 66% overweight/obese, and 45% gaining excessive gestational weight. Depressive symptoms were positively correlated with pre-pregnancy BMI ( $r = .268$ ,  $p = .046$ ), inversely related to gestational weight gain ( $r = -.329$ ,  $p = .013$ ), and not associated with excessive gestational weight gain. Black women were more likely to have excessive gestational weight gain than Hispanic women. Pre-pregnancy BMI and gestational weight gain data can be useful in identifying pregnant women with depression.

### Keywords:

Depression, gestational weight gain, obesity, pregnancy

## Depressive Symptoms and Obesity/Weight Gain Factors among Black and Hispanic Pregnant Women

Prenatal depression and obesity can compromise maternal and infant health. Among pregnant women, 25% have depressive symptoms (Bodnar, Wisner, Moses-Kolko, Sit, & Hanusa, 2009), over 50% are overweight or obese, and almost 50% gain excessive gestational weight during pregnancy (Hunt, Alanis, Johnson, Mayorga, & Korte, 2013). Maternal depression can cause preterm birth, delayed initiation in breastfeeding, and poor infant adaptive behavior (Grigoriadis, 2013). Overweight and obesity increase a woman's risks of gestational diabetes, pregnancy induced hypertension, and pre-eclampsia (Athukorala, Rumbold, Willson, & Crowther, 2010). Pregnant women gaining excessive gestational weight can develop several problems: gestational hypertension, difficult labor, having a baby larger than 4,000g, metabolic alterations in the baby, and maternal weight retention after delivery that can increase the likelihood of maternal future overweight and obesity (Crane, White, Murphy, Burrage, & Hutchens, 2009; Hoff, Cai, Okah, & Dew, 2009). Research investigating depression, obesity and weight gain in pregnant women is critical.

From previous studies investigating non-pregnant women, two phenomena are observed: there seems to be a positive bidirectional relationship between depression and obesity/weight gain; and obesity, body mass index [BMI], and weight gain are interchangeable in various studies (Atlantis & Baker, 2008; Blaine, 2008; Keddie, 2011). For instance, a 30-year longitudinal study found that, among women across their lifespan, depressed affect was associated with future weight gain as demonstrated in BMI and waist/hip circumferences (Sutin & Zonderman, 2012). On the other hand, among the 65,955 female registered nurses in the Nurses' Health Study followed from 1996 to 2006, those who were overweight or obese at

baseline were associated with an increased risk of reporting depression during the follow-up period (Pan et al., 2012).

Focusing on postpartum women, three studies found a positive relationship between postpartum depression and pre-pregnancy BMI (LaCoursiere, Baksh, Bloebaum, & Varner, 2006; Lacoursiere, Barrett-Corner, O'Hare, Hutton, & Varner, 2010) as well as postpartum depression and maternal gestational weight gain (Wright et al., 2013). Cline and Decker (2012), however, found an inverse relationship between postpartum depression and maternal gestational weight gain in a subgroup of obese women. The above studies were all cross-sectional and included women from 2 weeks to 6 months after delivery. Data from a longitudinal study showed that new onset of postpartum depression was associated with weight retention one year after delivery (Herring, 2008).

Research on pregnant women's obesity/weight gain has been greatly influenced by the 2009 Institute of Medicine's (IOM) gestational weight gain recommendations. According to the recommendations, underweight women (pre-pregnancy BMI < 18.5) are encouraged to have a total gestational weight gain of 28 to 40 pounds by the end of pregnancy. Normal weight women (pre-pregnancy BMI = 18.5-24.9) are expected to gain 25-35 pounds. Overweight women (pre-pregnancy BMI = 25.0-29.9) should gain 15-25 pounds, and obese women (BMI  $\geq$  30) 11-20 pounds. Three obesity/weight gain factors, therefore, are important when studying pregnant women: pre-pregnancy BMI, total gestational weight gain, and excessive gestational weight gain. Pre-pregnancy BMI is used to estimate a woman's weight status or body size before pregnancy in order for care providers to guide the woman's gestational weight management. Total gestational weight gain is the weight difference between body weight at the end of pregnancy and pre-pregnancy weight. Excessive gestational weight gain is determined when total

gestational weight gain exceeds the IOM weight gain range based on a pre-pregnancy BMI level.

To date, only a few studies have investigated the relationship between depression and obesity/weight gain in pregnant women and study findings are mixed. Inconsistent findings are probably due to the fact that various instruments are used in measuring depression. Some instruments, such as the Center for Epidemiological Studies Depression Scale, include more somatic symptoms than others (e.g., Edinburgh Postpartum Depression Scale) (Marcus, 2009). Somatic symptoms (appetite change, fatigue, and sleep disturbance) are manifested in depressed individuals, but these symptoms are also considered normal pregnancy-related changes. Inconsistent findings also are attributable to the timing of which depression and weight are measured during pregnancy. Further, studies without adopting the most recent IOM weight gain recommendations may define excessive weight gain differently.

Carter, Wood-Baker, and Brownwell (2000) found no significant relationship between prenatal depression and pre-pregnancy BMI when pre-pregnancy BMI data were retrospectively collected 4 months postpartum and depression was measured during pregnancy with the Center for Epidemiological Studies Depression Scale. Claesson, Josefsson, and Sydsjö (2010) found that depression, reflected in the Edinburgh Postpartum Depression Scale score, was not associated with gestational weight gain, but their study included only obese pregnant women. A positive relationship between major depression disorder, assessed with a structured interview guide, and pre-pregnancy BMI, however, was reported by Bodnar et al (2009). Webb, Siega-Riz, and Dole (2008) also found that more depressive symptoms, measured with the Center for Epidemiological Studies Depression Scale, were associated with a higher ratio of observed gestational weight gain over expected weight gain. Neither study finding a positive relationship between depression and obesity/weight gain in pregnant women used the most recent 2009 IOM

recommendations.

Black women are 2.25 times more likely than White women to be overweight or obese and the risk for overweight and obesity in Hispanic women is 1.36 times that of White women (Vahratian, 2009). The representation of Black and Hispanic pregnant women in previous studies that examined prenatal depression and obesity/weight gain has been limited, with as many as 80% of study samples being White women (Bodnar et al, 2009; Carter, Wood-Baker, & Brownell, 2000; Webb, Siega-Riz, & Dole, 2008). In the two previous studies with a large proportion of Black and Hispanic women, no correlation between depression and pre-pregnancy BMI or depression and gestational weight gain was found (Sangi-Haghpeykar, Lam, & Raine, 2013; Walker & Kim, 2002). These two studies, however, measured depression right after delivery before women were discharged from the hospital.

Clearly, there is a need to research depression and obesity/weight gain in pregnant women, particularly in minority pregnant women. The purposes of this study was to use the 2009 IOM recommendations to examine depression and obesity/weight gain in a group of low income Black and Hispanic pregnant women. This study had two specific aims: (1) to examine the respective relationships of depressive symptoms to pre-pregnancy BMI, gestational weight gain, and excessive gestational weight; and (2) to compare depressive symptoms, pre-pregnancy BMI, gestational weight gain, and excessive gestational weight between Black and Hispanic pregnant women.

## **METHODS**

A cross-sectional design was used for this study, which was approved by the institutional review board of Indiana University. Data were collected between August 2012 and January 2013.

## **Participants and Settings**

Women included in this study were English- or Spanish-reading and speaking pregnant women who were at least 18 years old, self-identified as Black or Hispanic as a race, and registered in one of the prenatal clinics of two community health centers in a large Midwest City. Exclusion criteria were pregnant women who had had psychiatric or mental health disorders that interfered with meaningful communication, or who were unable to speak or read English or Spanish. The two community health centers provided internal medicine, obstetric, and pediatric clinic services for resource-poor populations in the surrounding neighborhoods, and both health centers belonged to a county safety net health system. One of the two community health centers served a large number of Spanish-speaking patients.

A social worker in each of the two prenatal clinics helped recruit study participants. The social workers gave pregnant women a cover letter in English or Spanish that described the purpose of the study and what a study participant would be asked to do. When a woman indicated her interest, a research assistant obtained consent and then administered the instruments. The social worker in the clinic with the large number of Spanish-speaking pregnant women was bilingual, and she assisted with translation when needed.

A total of 87 women participated in this study; however, only 56 women had complete pre-pregnancy weight and height information for BMI calculation. Data analysis was based on these 56 subjects. Those women who did not provide pre-pregnancy weight and height information were more likely to be Hispanic (90% vs. 10%), have lower scores on the Edinburgh Depression Scale (mean 4.9 vs. 7.66), and not to have completed high school (72% vs. 26%) than the women who provided these data.

## **Measures**

### *Depression*

The Edinburgh Postnatal Depression Scale (Cox, Holden, & Sagovsky, 1987) was used to measure prenatal depressive symptoms. This scale, which has been shown to be valid and reliable in samples of pregnant women (Claesson, Josefsson, & Sydsjö 2010; Frederick, Williams, Sales, Martin, & Killien, 2008), includes 10 items on a 4-point Likert response format from 0 to 3 and assesses a woman's depressive symptoms in the past seven days. For instance, a pregnant woman could select one of the four choices, such as "*As much as I ever did*," "*Rather less than I used to*," "*Definitely less than I used to*," or "*Hardly at all*," to describe her mood related to the statement, "I have looked forward with enjoyment to things." The Edinburgh Depression Scale produces a score range of 0 to 30, with a higher score indicating more depressive symptoms. The scale developers suggested a score cutoff of  $\geq 10$  for possible depression, and that level was used in our study. At this cutoff level, the Edinburgh Scale demonstrates 100% sensitivity for detecting major depression and 82% specificity for correctly excluding those that do not have major depression (Claesson, Josefsson, & Sydsjö, 2010). Previous studies using this scale on pregnant and postpartum women reported Cronbach's alphas of .80 and .82, indicating good internal reliability (Bogaerts, et al., 2012; Cline & Desker, 2012). In our study, Cronbach's alphas were .88 for the English scale and .84 for the Spanish version. Both total score and binary outcome (likely depressed vs. not depressed) were included in the analysis.

### *Pre-pregnancy BMI*

Pre-pregnancy BMI was calculated based on self-reported pre-pregnancy weight and height. Pre-pregnancy BMIs were grouped into underweight (BMI < 18.5), normal weight (BMI = 18.5 to 24.9), overweight (BMI = 25 to 29.9), and obese (BMI  $\geq 30$ ). They were further

dichotomized into a binary category: overweight/obese vs. not overweight/obese. The overweight/obese group included women whose pre-pregnancy BMIs were 25 or greater and the non-overweight/obese group included women with a pre-pregnancy BMI of less than 25. Both continuous and categorical pre-pregnancy BMIs were used in analysis. Self-reported weight may be slightly lower than actual weight, but researchers believe its reliability generally is high (Frederick, Williams, Sales, Martin, & Killien, 2008).

### *Gestational Weight Gain*

We calculated a pregnant woman's gestational weight gain in pounds by subtracting pre-pregnancy weight from current weight at the time of data collection. For instance, if a pregnant woman's pre-pregnancy body weight was 120 pounds and she weighed 140 pounds when she was 27 weeks of gestation at the time of our data collection, then her gestational weight gain was  $140 - 120 = 20$  pounds.

### *Excessive Gestational Weight Gain*

We adopted trimester-specific expected weight gain ranges developed by Fontaine, Hellerstedt, Dayman, Wall, and Sherwood (2012) in order to decide if a pregnant woman had excessive gestational weight gain. The 2009 IOM weight gain recommendations include total weight gain allowed at the end of pregnancy and average weekly weight gain for the second and third trimesters. Based on these recommendations, Fontaine et al. estimated a range of total weight gain for the first (up to 12 weeks gestation), the second (13-27 weeks), and the third (28-40 weeks) trimesters by a woman's pre-pregnancy BMI. In our study, we compared gestational weight gain to Fontaine et al. expected trimester total gestational weight gain ranges and categorized weight gain as less than normal gain (below the expected weight gain range), normal gain (within the expected weight gain range), or excessive gain (exceeding the expected weight



gain range). A binary outcome was further created: excessive gestational weight gain vs. no excessive gestational weight gain. Women with less than normal gain or normal gain were combined into the group of no excessive gestational weight gain.

### **Data Analysis**

Data analysis was performed by using the Statistical Package for the Social Sciences (SPSS) software version 20. Means and standard deviations were calculated for continuous data. Frequencies and percentages were calculated for categorical data. For the first study aim, Pearson correlation coefficients ( $r_p$ ) were used to examine the relationships of depressive symptoms to pre-pregnancy BMI and gestational weight gain (all in continuous data format) and Spearman's rank correlation coefficient ( $r_s$ ) was calculated to estimate the direction and magnitude of the relationship of depressive symptoms to excessive gestational weight gain (binary variable).

To accomplish the second study aim about comparing study variables between Black and Hispanic women, the Student t test was used when compared variables were continuous data, and the Chi-square test was used when depression (likely depressed vs. not depressed), pre-pregnancy BMI (overweight/obese vs. not overweight/obese), gestational weight gain (excessive vs. not excessive) were in a binary format. The Student t and Chi-square tests were also performed to examine differences between Black and Hispanic women in continuous and categorical demographic and obstetric data when appropriate. All statistical tests were set at the .05 level of significance.

## **RESULTS**

Detailed demographic and obstetric information is presented in Table 1. Of the 56 women, 55% were Black and 45% were Hispanic, their average age was 26 years old, and about

one half had at least a high school education. Of the women, only 21% were pregnant for the first time and many were in their second (50%) or third (39%) trimester of pregnancy. A high percentage (70%) of the women was enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children or WIC. The mean pre-pregnancy BMI of these women was 27.2; 45% were overweight, 21% were obese, and 45% had excessive gestational weight gain. Of the women, 32% scored at or above 10 on the Edinburgh Scale and therefore were considered likely depressed. A small percentage of women was told by a doctor to have mood problems (14%) or received treatment for the problems (7%) before pregnancy.

### **Relationships among Studied Variables**

Correlations among the variables are presented in Table 2. Depressive symptoms were positively correlated with pre-pregnancy BMI ( $r_p = .268$ ,  $p = .046$ ), inversely related to gestational weight gain ( $r_p = -.329$ ,  $p = .013$ ), and not associated with excessive gestational weight gain. Because gestational weight naturally increases as pregnancy advances, we did a post hoc regression analysis to control for gestational weeks or trimesters of pregnancy. The regression analysis still showed that depressive symptoms remained inversely related to gestational weight gain. We also did subgroup analysis and found that the only significant correlation was in Black women about the inverse relationship between depressive symptoms and gestational weight gain ( $r_p = -.410$ ,  $p = .022$ ).

### **Comparisons of Studied Variables between Black and Hispanic Women**

Black and Hispanic women were different on many demographic and obstetric characteristics (Table 3). Black women were relatively more likely to have completed high school or higher education and be employed. Hispanic women, on the other hand, were more likely than Black women to have planned the index pregnancy, plan to breastfeed, and have a

history of more pregnancies.

Depressive symptom score (8.2 vs. 7.0), pre-pregnancy BMI (28.0 vs. 26.2) and gestational weight gain (16.4 vs. 13.2 lbs.) were not statistically different between Black and Hispanic pregnant women. Black women, however, were significantly more likely to have excessive gestational weight gain than Hispanic women (58% vs. 28%,  $X^2(1) = 5.062$ ,  $p = .02$ ).

## DISCUSSION

This study examined the relationships of depressive symptoms to pre-pregnancy BMI, gestational weight gain, and excessive gestational weight gain, respectively, in Black and Hispanic pregnant women recruited from two community health centers, as well as compared these variables between the two ethnic groups.

Depressive symptoms in our study were positively correlated with pre-pregnancy BMI. This positive relationship was also found in previous studies that included adult non-pregnant women (Blanchard, 2009; Ketti, 2011; Pan et al., 2012), postpartum women (LaCoursiere, Barrett-Connor, O'Hare, Hutton, & Varner, 2010), or pregnant women (Bodnar et al., 2009). One previous study, however, did not find such a relationship when pre-pregnancy BMI was collected four months after delivery (Carter, Wood-Baker, & Brownell, 2000). Although our study could not determine a causal relationship, an assumption may be made: a high BMI before pregnancy could be a risk factor for developing depression during pregnancy. Further analysis in our study (data not reported in the results section) showed that more overweight/obese pregnant women (35%) scored at 10 or higher on the Edinburgh Scale than those who were not overweight/obese (26%). Collecting a pregnant woman's pre-pregnancy BMI in the first prenatal visit may be necessary because such data can add to the assessment of possible depression.

Cline and Decker (2012) found an inverse relationship between depression and

gestational weight gain among obese women. We also found depressive symptoms to be inversely correlated with gestational weight gain and this negative relationship was especially significant in Black pregnant women. Many women believe that weight gain is a positive sign for a healthy and growing baby and pregnancy is the only time to eat what they want (Groth & Kearney, 2009). More weight gain, therefore, may offer pregnant women some satisfaction and comfort and shield them from developing depressive symptoms. Carter, Wood-Baker, and Brownell (2000) proposed that when increased weight is acceptable to a woman during pregnancy, higher weight will be less likely to cause depression. Black women are believed to be more accepting of being overweight and do not view the weight as a problem (Blanchard, 2009), which may help explain the inverse relationship between depressive symptoms and gestational weight gain found in Black women in our study. This inverse relationship, however, could also be because a high level of depression may have contributed to low gestational weight gain in our study sample. Depression may cause poor appetite, low energy, and inadequate self-care ability necessary for a pregnant woman to attend to her nutrition needed for gaining gestational weight. This inverse relationship indicates assessing weight gain and depression simultaneously is needed.

Black pregnant women in our study were more at risk than Hispanic women to exceed the IOM recommended gestational weight gain (58% vs. 28%). Black women were different from Hispanic women in many demographic and obstetric factors, which, together with their higher rates of overweight/obesity (71% vs. 60%) may indirectly or directly have made the Black pregnant women more susceptible to excessive gestational weight gain.

Even though we found significant relationships of depressive symptoms to pre-pregnancy BMI and gestational weight gain, we lack data to explain their pathways. We suggest that future

research include theoretically based potential physiological (e.g., appetite, metabolic diseases) or psychosocial factors (e.g., self-efficacy for healthy eating and physical activity, cultural belief) that might explain how depression mediates or moderates obesity/weight gain or vice versa in pregnant women.

### **Practice Implications**

Assessing a pregnant woman's weight and depression should be included in prenatal care because a large number of women are affected by depression and overweight/obesity. Our study identified 32% of pregnant women with a depression score indicative of depression, 45% being overweight, 21% obese, and 45% gaining excessive gestational weight. Assessing weight and depression during first and subsequent prenatal visits help care providers to intervene when weight or depression seems to be deviant from the norm. Pre-pregnancy BMI and gestational weight gain are correlated with depression; these weight-related data may alert care providers to perform depression assessment for a pregnant woman and depression data may also warn providers of potential weight issues in the woman.

Teaching pregnant women about weight gain and depression is also critical. Pregnant women should be informed of depressive symptoms and the amount of pregnancy weight to gain based on their body size. Just like knowing one's own cholesterol level or blood pressure, a pregnant woman should be encouraged to monitor changes in her gestational weight and mood. High energy intake and low physical activity contribute to excessive gestational weight gain (Stuebe, Oken, & Gillman, 2009). Health professionals in healthcare settings or community programs, therefore, are challenged to develop culturally relevant interventions for pregnant women to engage in healthful diet and physical activity before conception and during pregnancy in order to avoid unnecessary weight accumulation. Further, support and referral for treatment

should be considered for pregnant women with depression and not gaining enough gestational weight.

Promoting healthy mothers and babies needs to be a team and community effort. About 70% of the pregnant women in our study were enrolled in the WIC program. Since WIC service and other community outreach programs interact with pregnant women, they would be great assets to these women by offering routine or periodical weight and depression assessment, teaching and counseling. We excluded, especially, many Hispanic pregnant women in our study because these women did not know their pregnancy height or weight. An out-of-the-box suggestion would be that having free weight and height scales available in public areas, such as grocery or drug stores, so that women who cannot afford weight/height scales can do self-assessment as frequently as they shop.

### **Limitations**

There were several limitations to our study. The small sample size may limit this study's power to detect additional significant relationships among variables or differences in variables between groups. Pre-pregnancy BMI was based on self-reported data, and recall bias may have influenced the accuracy of those data. However, previous studies also used self-reported pre-pregnancy weight and height. It is difficult to access a woman's objective weight and height records before she has become pregnant. Another limitation of the study was that gestational weight gain did not represent the total weight a pregnant woman had gained for her whole pregnancy. It might be that some women gained more or less after our data collection point. However, collecting weight gain data before the end of pregnancy allowed us to assess weight gain in each trimester. Furthermore, the pregnant women were recruited from two community health centers in one geographical area, and study findings may not be generalizable to pregnant

women in other care settings. Finally, a high percentage of women (26%) did not know their pre-pregnancy height and weight. These missing data might have increased selection bias.

### CONCLUSION

In conclusion, we found depressive symptoms to be positively correlated with pre-pregnancy BMI and negatively related to gestational weight gain in Black and Hispanic pregnant women. Furthermore, Black women were relatively at more risk for excessive gestational weight gain. Assessing pre-pregnancy BMI and gestational weight gain may help identify depressed pregnant women. Interventions to help pregnant women reduce depressive symptoms and adhere to the IOM recommended weight gain need to be culturally and ethnically relevant.

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Table 1. Demographic, Obstetric, and Weight Information of the Studied Pregnant Women (N = 56)

	M (SD)	n (%)
Age	26.3 (6.3)	
Number of pregnancy	2.3 (2.0)	
Pre-pregnancy BMI	27.2 (6.1)	
Depression mean score	7.7 (5.3)	
Ethnicity		
Black		31 (55%)
Hispanic		25 (45%)
High school education or higher		31 (55%)
Employed		28 (50%)
Gestational weeks at interview		
1 <sup>st</sup> trimester (up to 12 wks)		6 (11%)
2 <sup>nd</sup> trimester (13 to 27 wks)		28 (50%)
3 <sup>rd</sup> trimester (28 to 42 wks)		22 (39%)
First pregnancy		12 (21%)
Planned pregnancy		23 (41%)
Plan to breastfeed		44 (79%)
Enrolled in WIC		39 (70%)
Smoking during pregnancy		5 (9%)
Told by doctor to have mood problems before pregnancy		8 (14%)
Treatment for sadness before pregnancy		4 (7%)
Likely depressed (depression score $\geq 10$ )		18 (32%)
Pre-pregnancy weight status based on BMI		
Underweight		2 (4%)
Normal weight		17 (30%)
Overweight		25 (45%)
Obese		12 (21%)
Gestational weight gain against recommendation		
Less than normal gain		13 (23%)
Normal gain		18 (32%)
Excessive gain		25 (45%)

Table 2. Correlations among Depressive Symptoms, Pre-pregnancy BMI, Gestational Weight Gain, and Excessive Gestational Weight Gain

	Depressive symptoms r (p)	Pre-pregnancy BMI r (p)	Gestational weight gain r (p)
Whole group ( n = 56)			
Pre-pregnancy BMI	.268* (.046)		
Gestational weight gain	-.329* (.013)	-.249 (.064)	
Excessive gestational weight gain <sup>a</sup>	-.037 (.788)	.137 (.315)	.671** (<.001)
Black ( n = 31 )			
Pre-pregnancy BMI	.217 (.240)		
Gestational weight gain	-.410* (.022)	-.097 (.605)	
Excessive gestational weight gain <sup>a</sup>	-.059 (.754)	.084 (.653)	.695** (<.001)
Hispanic ( n = 25 )			
Pre-pregnancy BMI	.123 (.558)		
Gestational weight gain	-.085 (.685)	-.289 (.161)	
Excessive gestational weight gain <sup>a</sup>	-.112 (.595)	.154 (.461)	.606** (<.001)

\*Correlation is significant at the .05 level (two-tailed)

\*\* Correlation is significant at the .001 level (two-tailed)

a: Coefficients were based on Spearman's rho; all others were from Pearson correlation

Table 3. Comparisons of Demographic/Obstetric History, Depressive Symptoms, Pre-pregnancy BMI, Gestational Weight Gain, and Excessive Weight Gain between Black and Hispanic Women

	Black N = 31 n (%)	Hispanic N = 25 n (%)	p
High school education or higher	21 (68%)	10 (40%)	.04*
Employed	20 (65%)	8 (32%)	.02*
First pregnancy	9 (29%)	3 (12%)	.12
Planned pregnancy	7 (23%)	16 (64%)	.002*
Plan to breastfeed	20 (65%)	24 (96%)	.004*
Enrolled in WIC	26 (71%)	17 (68%)	.81
Smoking during pregnancy	5 (16%)	0 (0%)	.06
Told by doctor to have mood problems before pregnancy	5 (16%)	3 (12%)	.72
Treatment for sadness before pregnancy	4 (13%)	0 (0%)	.12
Likely depressed (depression score $\geq 10$ )	10 (32%)	8 (32%)	.98
Pre-pregnancy BMI as overweight or obese	22 (71%)	15 (60%)	.39
Excessive gestational weight gain	18 (58%)	7 (28%)	.02*
	M (SD)	M (SD)	
Age	24.5 (5.8)	27.2 (6.8)	.30
Number of pregnancy	1.9 (1.7)	2.9 (2.1)	.045*
Gestation in weeks	26.0 (9.0)	22.5 (9.0)	.15
Depression mean score	8.2 (5.6)	7.0 (4.9)	.38
Pre-pregnancy BMI	28.0 (6.9)	26.2 (4.8)	.29
Gestational weight gain in pounds	16.4 (16.1)	13.2 (19.3)	.50

\*indicates significant at the level of .05