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A prospective study of perinatal depression and trauma history in pregnant minority adolescents

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Abstract

OBJECTIVE—Adolescent pregnancy is common and minority adolescents are at high risk. We sought the following: (1) to prospectively assess prevalence of antenatal depression (AND) and postpartum depression (PPD) in minority adolescents and (2) to examine the association of social support and adjustment, trauma, and stress on depression status.

STUDY DESIGN—A total of 212 pregnant adolescents were recruited from public prenatal clinics and administered a prospective research survey during pregnancy and 6 weeks postpartum. Depression was measured using the Edinburgh Postnatal Depression Scale. Univariate, bivariate, and multivariable analyses were performed using logistic regression to assess predictors of AND and PPD.

RESULTS—In our cohort, 20% screened positive for AND and 10% for PPD. The strongest predictor of PPD was AND (odds ratio [OR], 4.89; $P < .001$). Among adolescents with trauma history, there was a 5-fold increase (OR, 5.01) in the odds of AND and a 4-fold increase (OR, 3.76) in the odds of PPD. AND was associated with the adolescent's poor social adjustment ($P < .001$), perceived maternal stress ($P < .001$), less social support ($P < .001$), and a less positive view of pregnancy ($P < .001$). PPD was significantly associated with primiparity ($P = .002$), poor social adjustment ($P < .001$), less social support and involvement of the baby's father ($P < .001$), and less positive view of pregnancy ($P < .001$).

CONCLUSION—Significant independent risk factors for PPD include AND, view of pregnancy, and social support. Trauma history was highly prevalent and strongly predicted AND and PPD. Point prevalence decreased postpartum, and this may be due to transient increased social support following the birth, warranting longer follow-up and development of appropriate interventions in future work.

Keywords

adolescents; perinatal depression; postpartum depression; pregnancy; trauma

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Adolescent pregnancy is a burdensome public health issue in the United States with a prevalence of 10% of adolescent girls under the age of 21 years.¹⁻³ In 2008, there were 68 adolescent pregnancies per 1000 women in the United States, and this was a record low.¹ The recent decline in prevalence may be primarily attributed to improved contraceptive use.⁴ However, the US adolescent pregnancy rate is among the highest in the developed world, more than twice as high as Canada and Sweden.⁵

There are significant risks associated with adolescent pregnancy including poor maternal weight gain, preterm birth, pregnancy-induced hypertension, low birth-weight, and neonatal death.^{6,7} Most adolescent pregnancies are unintended,⁸ and this places adolescent mothers and their children at increased risk for depression, poverty, abuse, and neglect⁹⁻¹³ during both pregnancy and postpartum.⁹

These negative outcomes are exacerbated in women who are characterized as low income and racial/ethnic minority status, which are common demographic characteristics of adolescent mothers.^{3,10} Adolescent mothers face significant obstacles including the simultaneous developmental tasks of adolescence and parenting an infant,¹ leading to increased risk of depression, emotional and behavioral problems, and parenting difficulties.¹²⁻¹⁵

Perinatal depression

Depression during pregnancy (antenatal [AND]) and postpartum depression (PPD) have a prevalence of 10–15% in adult women¹⁶⁻²⁰ and are associated with significant morbidity to the mother, the newborn, and the family.^{16, 21} Despite the significant public health impact of perinatal depression (PND), the risk factors and prevalence of PND in adolescent mothers have not been well described, nor are they part of standard clinical care. Existing estimates for the prevalence of PND in all populations of adolescent mothers ranges from 16% to 44%.²² However, these estimates are severely limited because they come from small samples of adolescent mothers using cross-sectional survey designs and do not include Spanish-speaking adolescents.

The rate of PND in minority adolescents is estimated to be greater than 40%.²² Prior studies have reported that adolescents are more likely to be depressed if they have poor social support, increased stress, and low self-esteem.^{9,13,23,24} Limitations of these prior studies include small sample sizes of typically less than 100 women, retrospective design, and/or limited measures of depression. To date, no study has assessed multiple risk factors to create a model for examining the risk for PND in adolescent mothers. Our study location in North Carolina presented a unique opportunity to assess PND in minority adolescents. In the state capital of Raleigh, (Wake County) in 2010, adolescent women (younger than 20 years of age) reported 1116 live births (44.8% racial/ethnic minority).²⁵

Study-specific aim

To address the gaps in knowledge described above, the aims of our study were 2-fold: (1) to prospectively estimate the prevalence of depression status and severity of comorbid psychiatric symptoms in pregnant adolescents at 2 time points: time 1, during pregnancy (12–40 weeks' gestation), and time 2, at 6 weeks postpartum; and (2) to examine risk factors for PND including association of trauma history, functional impairment, social support, social adjustment, self-efficacy, view of pregnancy, and current stressors in adolescent mothers at these 2 time points. We hypothesized that a history of trauma and poorer social support would be associated with increased prevalence of depression at both study time points.

Materials and Methods

We collected self-reported survey data at 2 time points (pregnancy and 6 weeks' postpartum) from 212 consecutive adolescent women presenting for care at a low-risk urban health department obstetrical clinic in Raleigh, NC, from July 2010 to August 2011. Eligible subjects were English- and Spanish-speaking pregnant adolescents between the ages of 12 and 20 years. The subjects were recruited and completed the first survey at a prenatal visit in the second or third trimester. The second survey was administered at the routine 6 week postpartum visit. There were 187 adolescent mothers who completed both surveys, reflecting an 88% retention rate. Twenty-five subjects were lost to follow-up after delivery or had incomplete data and are not included in this study.

The study was approved by the University of North Carolina Institutional Review Board Committee for the Protection of Human Subjects. All subjects gave informed consent and signed the Health Insurance Portability and Accountability Act release.

Measures

In addition to questionnaires to assess demographic information, medical history, and obstetrical history, the following instruments were included in either the antenatal survey or postnatal survey.

Edinburgh Postnatal Depression Scale

The 10 item Edinburgh Postnatal Depression Scale (EPDS) was developed specifically for assessing PPD and is one of the most commonly used and well-validated self-report instruments.^{18,26,27} A cutoff of score of 12 or greater on the EPDS has been consistently shown to be associated with major depression, when compared with a structured clinical interview.²⁶ The EPDS scores of 10–12 have been associated with an accurate diagnosis of minor depression. In our analysis, we used a cutoff score of 11 or greater as a positive screen.

Trauma inventory

Trauma history, including neglect and emotional and sexual and physical abuse history, was obtained by modifying a structured interview from previous research.^{28–31} Sexual abuse was defined as genital touching or vaginal or anal intercourse during which force or a threat of harm was present. In children younger than 13 years, the threat of force or harm was indicated by a 5 year age differential between the victim and perpetrator. Physical abuse was defined as incidents separate from sexual abuse that included life-threatening physical attack with the intent to kill or seriously injure or other physical abuse such as being beaten, kicked, or burned. A summary measure of number of cumulative categories of lifetime traumas was constructed.

Social support: Medical Outcomes Survey

The Medical Outcomes Survey (MOS) is a widely used scale considered universally applicable to assess social support with coefficient alphas greater than 0.91.³² The survey consists of 4 separate social support subscales and an overall functional social support index. Higher scores indicate higher levels of support.³³

Social adjustment scale self-report

We used the 9 question Social and Leisure Domain of the Social Adjustment Self-Report (SAS-SR).^{34,35} Questions address the performance at expected tasks, friction with others, interpersonal relationships, and feelings and satisfactions. Each item is scored on a 5 point

scale, with higher scores indicating poorer functioning. An internal consistency reliability of $\alpha = 0.76$ has been reported for the SAS-SR total score.³⁶

Social support from baby's father

Social support received from the baby's father was measured using an 8 item scale (DAD) that has good internal consistency of 0.90 and has been validated in an adolescent population.^{37,38} This measure addresses how much the baby's father has provided material support, assisted with tasks, listened to worries, and helped solve problems. Additional questions address how often the father had disappointed the mother or was critical or short tempered, and the final item assesses overall satisfaction with support from the baby's father.

Life stressors

The Everyday Stressors Index (ESI) is a 20 item instrument with good internal consistency designed to capture the level of daily stressors faced by mothers of young children.³⁹ It uses a 4 point scale that is summed for a total level of stress and assesses parenting concerns, quality/safety of living arrangements, finances/employment, health, and relationship issues.

General Self-Efficacy Scale

The 17 item General Self Efficacy Scale (GSES) measures general self-efficacy expectancies by addressing a willingness to initiate behavior, expend effort in completing the behavior and persistence in the face of adversity, and demonstrates excellent reliability with a reported Cronbach alpha coefficient of 0.86.^{40,41} A total score was calculated by summing the scores, with the higher total scores indicating higher levels of self-efficacy.

Postpartum Adjustment Questionnaire

We used the 9 item New Baby Subscale of Postpartum Adjustment Questionnaire (PPAQ) to assess the mother's relationship with her baby. The PPAQ has good reliability (coefficient alpha is 0.75).⁴² Most items were scored on a scale of 1 to 5, with higher scores indicating poorer functioning. Scores for all 9 items were summed to calculate an overall score.

Statistical methods

Analyses were conducted using SAS statistical software (SAS Inc., Cary, NC). In our sample of adolescent mothers, we performed descriptive statistics that included percent tabulations for categorical variables and means with SDs for continuous variables. The statistical significance level was set at $P < .05$, and there were no corrections for multiple comparisons. Our primary outcome measure was depression status as defined by a positive score on the EPDS (11 or greater) in both the prenatal and postpartum surveys. Bivariate analyses were conducted using χ^2 statistics for categorical variables and analysis of variance for continuous variables to compare the depression status in both the prenatal and postpartum groups to the sum scores of the measures of social adjustment (SAS), social support (MOS and DAD), life stressors (ESI), trauma history, and general self-efficacy (GSES). We also compared depression status with how positively the pregnancy was viewed by the adolescent mother and compared trauma history with the adolescent's perception of self-efficacy and social adjustment. Finally, we performed multivariable logistic regression analyses to identify predictors of AND and postpartum PPD.

Results

Demographic characteristics

Table 1 describes the demographic characteristics for our study cohort and compares the characteristics of the depressed (EPDS score of 11 or greater) vs nondepressed (EPDS score less than 11) adolescent mothers at the antenatal assessment. Respondents averaged 18 years of age and 87% were self-identified as a minority group (37% African American and 46% Latina). The vast majority (89%) reported never being married. Approximately 24.5% of the respondents reported completing high school and 50.3% reported partial completion of high school. Most respondents were living in poverty, with approximately 80% having an annual household income of less than \$30,000 per year. Subjects reported high rates of physical and sexual abuse, with 50% reporting a history of at least 1 traumatic event. Importantly, a history of abuse or trauma emerged as the only statistically significant demographic variable that differed between groups (depressed vs nondepressed adolescent mothers) at the first antenatal assessment (71.73% of depressed vs 44.4% of nondepressed, $P < .005$).

With regard to obstetrical history, most of the respondents were primiparous (74.7%) and 92% delivered a term infant (gestation of 37 weeks or longer). At the postpartum assessment, although 32% of the respondents reported having resumed sexual activity, the majority (61%) were not using birth control.

Diagnosis of depression during pregnancy and postpartum

The Figure depicts the depression status based on the EPDS scores during pregnancy and postpartum. We defined an EPDS score of 11 or greater as a positive screen for depression because we wanted to capture a significant degree of depressive symptoms including both minor and major depression.²⁶ The average time point for completion of the prenatal survey was during the late second trimester, and 20.1% had a positive screen for depression. At the 6 week routine postpartum assessment, 10.3% had positive screen for depression. Therefore, there was a decrease of nearly 50% in the rate of depression between the prenatal data collection and the postpartum data collection among our respondents.

Relation of perception of pregnancy, trauma history, and social support

We then examined the relation between depression status during both pregnancy (Table 2) and postpartum (Table 3) and measures of social support and other psychosocial variables. We observed that social support increased at the postpartum visit in terms of both support from the father of the baby as measured by the DAD (1.05; $P = .03$) and general social support (0.13; $P = .03$) as measured by the MOS.

We calculated correlation coefficients and observed that AND was significantly associated with poor social adjustment ($r = 0.45$, $P < .001$), perceived maternal stress ($r = 0.36$, $P < .001$), and trauma history ($r = .20$, $P = .007$). Conversely, there was a significant inverse association between AND and social support ($r = -0.41$, $P < .001$), how positive the adolescent viewed her pregnancy ($r = -0.45$, $P < .001$), and maternal self-efficacy ($r = -0.27$, $P = .002$).

We also examined these associations with PPD. PPD was significantly associated with primiparity ($r = 0.23$, $P = .002$), poor social adjustment ($r = 0.40$, $P < 0.001$), stress ($r = 0.35$, $P < 0.01$), and poor postpartum adjustment ($r = 0.23$, $P = .002$). Conversely, PPD had a significant inverse association with increased social support ($r = -0.56$, $P < .001$), how positive the adolescent viewed her pregnancy ($r = -0.27$, $P < .001$), and involvement of the baby's father ($r = -0.32$, $P < .001$).

Next, we performed multivariable logistic regression for both AND and PPD. In the antenatal multivariable logistic regression (Table 4), trauma history (odds ratio [OR], 5.01; 95% confidence interval [CI], 1.34–18.70; $P < .02$), how positive the pregnancy was viewed (OR, 0.48; 95% CI, 0.28–0.83; $P < .008$), and social support as measured by the MOS (OR, 0.35; 95% CI, 0.16–0.76; $P < .008$) emerged as significant independent risk factors for PND in a cohort of adolescent mothers. Similarly, in the postpartum multivariable logistic regression (Table 5), trauma history (OR, 3.76; 95% CI, 1.46–9.66; $P < .006$), how positive the pregnancy was viewed (OR, 0.43; 95% CI, 0.27–0.69; $P < .001$), and social support as measured by the MOS (OR, 0.55; 95% CI, 0.32–0.93; $P < .03$) also emerged as significant independent risk factors for PPD in our study sample. Moreover, AND emerged as the largest risk factor for PPD (adjusted OR, 4.89; 95% CI, 1.78–13.43; $P < .0001$).

Comment

Our cohort comprised adolescent mothers seeking prenatal care at a health department obstetrical clinic and represents 1 of the largest prospective studies of low-income adolescent mothers conducted to date. We found that 20% had a positive screen for depression as measured by the EPDS during pregnancy and 10% had a positive screen at 6 weeks postpartum. Consistent with the literature in both adolescent and adult women, AND emerged as the strongest predictor of PPD in this adolescent cohort.¹⁸ Interestingly, in our cohort, the estimates of the point prevalence of perinatal depression are markedly lower than the many previous estimates in adolescent mothers. The 50% reduction in the prevalence of depression between the prenatal and postpartum visit is also noteworthy and has important implications for the clinical assessment and management of adolescent mothers.

First, many studies of adolescent mothers have focused only on identifying PPD.⁴³ Second, a recent metaanalysis of studies examining outcomes for infants of mothers with AND showed alarming differences between the neonates of depressed mothers and mothers who did not experience AND including increased risk for low birthweight and preterm birth.⁴⁴ Third, waiting until the postpartum period to screen for depression is problematic. Forman et al⁴⁵ found that treating PPD alone is not sufficient to repair the disruption in the mother-infant relationship. Therefore, it is critically important for screening to begin during pregnancy to identify and treat AND and PPD in adolescent mothers because of the increased risk of negative health and developmental outcomes without the additional risk and burden of perinatal depression.

The high prevalence of trauma and abuse in this population (~50%) warrants careful consideration because a history of trauma was a significant predictor of AND and PPD. This rate of abuse is double that reported in the general population of women.⁴⁶ Among the adolescents with a trauma history, there was a 5-fold increase (OR, 5.01) in the odds of having prenatal depression and a 4-fold increase (OR, 3.76) in the odds of having PPD.

These data speak to the importance of obtaining a careful trauma history during pregnancy and assessing for ongoing risk of trauma and violence in this at risk population. Our sample is comprised almost exclusively of low-income minority adolescents, including almost half who are Latina. This may contribute to differences from previous samples influenced by cultural and ethnic factors that require further evaluation in future research.

One possible explanation for the differences in estimates of perinatal depression in the present study is that PND was assessed at only 1 time point during pregnancy and then again in the early (6 weeks) postpartum period. However, our data demonstrate that the adolescent's negative perception of pregnancy and insufficient social support are significant risk factors for PND. We found that less social support, poorer perception of the pregnancy, and less maternal self-efficacy were associated with increased likelihood of depression

during pregnancy. In the postpartum period, less social support, poorer perception of the pregnancy, and less involvement of the baby's father were all associated with greater risk for PPD.

Our results demonstrate that general social support and support from the baby's father increase at the 6 week postpartum time point; however, we hypothesize that this time period may represent a supposed honeymoon period, possibly because of a transient mobilization of social support once the baby arrives and the excitement over the birth of the baby. This may help to explain the lower rate of PPD (as compared to AND) in our study.

Future work needs to include a thorough investigation of the cultural and ethnic factors that may contribute to how the adolescent and her family cope with the baby's arrival. Subsequent research should account for symptoms across pregnancy and should extend longer into the postpartum period. Past studies have shown that risk for depression increases after 2 months postpartum.¹⁶ We hypothesize that longitudinal follow-up through the first year postpartum in this population would result in decreased social support beyond that seen in the early postpartum period (at 6 week time point) and subsequently demonstrate increased rates of depression.

The present study has a number of limitations. First, our sample assessed adolescent mothers during pregnancy and the early postpartum period but did not include multiple assessments during pregnancy or long-term postpartum follow-up. Second, although our study used validated self-report measures, it did not assess prepartum psychiatric functioning or include a structured clinical psychiatric interview. Third, we assessed only the adolescent mothers and did not assess the attitudes/perceptions of the father of the baby or other family members who could play a prominent role in the life of the adolescent. Fourth, our trauma measure is retrospective, and thus, there is a possibility of memory biasing reporting.⁴⁷ Fifth, we did not correct for multiple comparison and tested many hypotheses.

Clinical implications and future directions

Adolescent pregnancy is a highly significant public health issue in the United States, especially among low-income minority populations. Four of five pregnancies in adolescents are unintended,³ and the resulting consequences and risks associated with adolescent pregnancy are enormous including poor birth outcomes and the perpetuation of high rates of poverty, trauma/abuse, and lack of education. Comorbid perinatal depression is common in adolescent mothers and requires careful evaluation and targeted treatment with attention to both pregnancy and the postpartum period. In particular, obstetrical providers are in a unique position to identify adolescent mothers during routine prenatal care who suffer from AND. Screening during pregnancy is strongly recommended to mitigate adverse birth and postpartum outcomes.

In conclusion, our study demonstrates the critical need to comprehensively screen adolescent mothers for current depressive symptoms, histories of trauma and abuse, and current social support. Moreover, the degree of social support may change over the course of the pregnancy and postpartum period, necessitating ongoing follow-up. Future work should focus on developing differentiated and targeted treatment interventions for minority adolescents, with attention placed on relevant cultural and ethnic factors.

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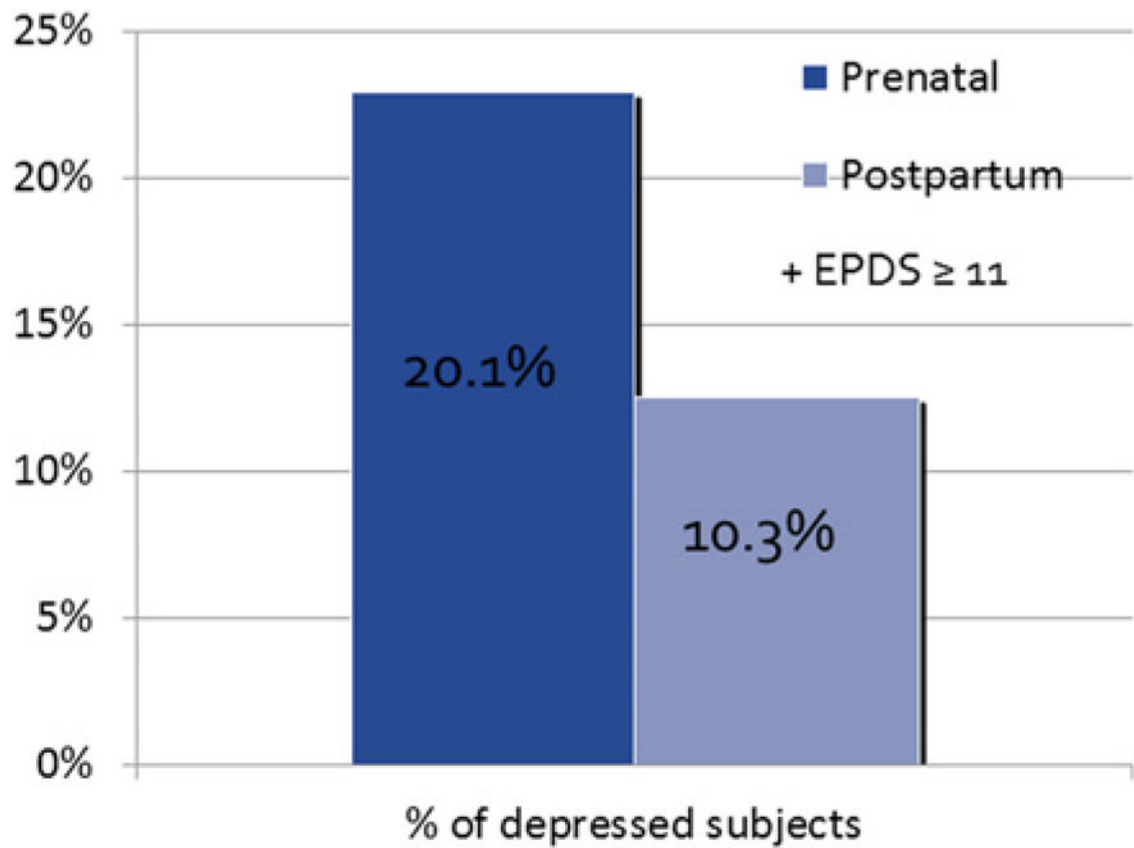


FIGURE 1.

FIGURE Depression status by EPDS Score during pregnancy and postpartum
EPDS, Edinburgh Postnatal Depression Scale.

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TABLE 1

Demographic variables comparing depressed vs non-depressed adolescent mothers

Variable	Depressed (EPDS 11 or greater)	Nondepressed (EPDS less than 11)	P value
Age, y	18.4 years	18.2	.41
Race (% minority)	89.2% minority	86.3%	.79
Marital status (% never married)	91.4%	88.2%	.77
Relationship status	37.8% cohabitating with partner	47.6%	.36
Parity (% primiparous)	74.0%	75.7%	.99
Unplanned pregnancy	78.0% unplanned	86.5%	.19
Household income (% less than \$30K annually)	79.0%	89.0%	.22
School status (% not in school)	69.0%	69.4%	.99
Work status (% unemployed)	74.3	77.3	.83
Trauma history	71.73% with physical or sexual trauma	44.4% with physical or sexual trauma	.0047
Contraception	64.9% not using at postpartum visit	60.0% not using at postpartum visit	.71
Sexual activity	32.4% active at postpartum visit	32.6% active at postpartum visit	.99
Breast vs bottle feeding	41.7% exclusively bottle feeding	44.9% exclusively bottle feedings	.86

Meltzer-Brody. Perinatal depression in minority adolescents. *Am J Obstet Gynecol* 2013.

TABLE 2

Correlation between prenatal depression and psychosocial assessment measures

Assessment measure	r	P value
Trauma history	0.20	.007
Social support	-0.41	<.001
How positive pregnancy viewed	-0.45	<.001
Maternal self-efficacy	-0.27	.002
Social adjustment	0.45	<.001
Life stressors	0.36	<.001

Meltzer-Brody. Perinatal depression in minority adolescents. *Am J Obstet Gynecol* 2013.

TABLE 3

Correlation between postpartum depression and psychosocial assessment measures

Assessment measure	r	P value
Primiparous	0.23	.002
Social support	-0.56	<.001
How positive pregnancy viewed	-0.27	<.001
Social adjustment	0.40	<.001
Life stressors	0.35	<.01
Postpartum adjustment	0.23	.002
Involvement of baby's father	-0.32	<.001

Meltzer-Brody. Perinatal depression in minority adolescents. *Am J Obstet Gynecol* 2013.

TABLE 4

Multivariable logistic regression of independent risk factors for prenatal depression reported in ORs

Variable	OR	95% CI	P value
Trauma history	5.01	1.34–18.70	.017
How positive pregnancy viewed	0.48	0.28–0.83	.008
Social support (MOS)	0.340	0.0.16–0.76	.008

CI, confidence interval; *MOS*, Medical Outcomes Survey; *OR*, odds ratio.

Meltzer-Brody. Perinatal depression in minority adolescents. *Am J Obstet Gynecol* 2013.

TABLE 5

Multivariable logistic regression of independent risk factors for PPD reported in ORs

Variable	OR	95% CI	P value
Trauma history	3.76	1.46–9.66	.006
How positive pregnancy viewed	0.431	0.27–0.686	<.001
Social support (MOS)	0.549	0.32–0.93	.03

CI, confidence interval; *MOS*, Medical Outcomes Survey; *OR*, odds ratio; *PPD*, postpartum depression.

Meltzer-Brody. Perinatal depression in minority adolescents. *Am J Obstet Gynecol* 2013.