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Depressive Symptom Prevalence and Predictors in the First Half of Pregnancy

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Abstract

Introduction: Major depression during the peripartum (MDP) period carries significant public health impact due to the potential adverse effects on maternal, infant, and family outcomes.
Methods: As part of a larger longitudinal study, this cross-sectional observational study sought to build upon the current literature on the prevalence and predictors of depression in the early second trimester of pregnancy, as related to generally accepted risk factors and other less explored risk factors.
Results: The findings from this study suggest that in this sample of 230 black and white women at ~14 weeks gestation, ~19% endorsed depressive symptoms and that the most important predictors of depression in pregnancy were a preconception history of a mental health issue (*e.g.*, lifetime depressive episode) and perceived stress. Other relevant predictors were pregnancy-related anxiety, income, and stressful life events.
Conclusion/Clinical Relevance: It is important for clinicians not only to screen for MDP during prenatal visits by asking about current depressive, stress, and anxiety symptoms but also to identify patients at risk for MDP by asking simple questions about history of preconception/lifetime episodes of depression and stressful life events. Given the variance accounted for by lifetime depression, additional research into how clinicians may approach this important topic is warranted. For example, checklists given in the waiting room may be less likely to elicit endorsement compared with conversations aimed to normalize the range of depressive histories that may have relevance to obstetric health.

Keywords: depression, pregnancy, risk factors

Introduction

Depression is a leading cause of morbidity and disability.[1] In women, the incidence of depression peaks during the reproductive years, which increases the likelihood of symptom onset or relapse during or after pregnancy.[2,3] Major depression during the peripartum (MDP) period, defined by the Diagnostic and Statistical Manual of Mental Disorders 5th edition as a depressive episode occurring during pregnancy or within 4 weeks following delivery,[4] warrants empirical attention due to the high prevalence and the negative sequelae for women, their children, and their families.[5] Up to 20% of women may experience depressive symptoms during their pregnancy, and ~10% of pregnant women have symptoms which qualify as a major depressive disorder/episode.[6,7] Similarly, up to 20% of women experience major depressive episodes in the postpartum period.[8,9] Despite recent recommendations to screen for depressive symptoms in pregnancy,[10] depressive symptoms continue to be underidentified and undertreated in pregnant women.[6] A focus on onset of depression in pregnancy is important because strategies, which may intervene with symptoms and which provide women with tools for management of symptoms early in onset, may enhance prognosis for the woman, her child, and her family.[11,12] Furthermore, a more complete understanding of predictors of MDP may help clinicians identify women at risk so that prevention strategies may be implemented to enhance the health and well-being of women and their families.

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MDP carries significant public health impact due to the potential adverse effects on maternal, infant, and family outcomes. The possible maternal consequences of untreated depressive symptoms during pregnancy include poor self-care, altered nutrition, substance use/abuse, suicide, increased risk of postpartum depression, and increased risk of obstetric complications such as preterm birth.[13] Infants exposed *in utero* to maternal depression may be at risk for low birth weight and developmental delays.[3,14,15] Recent evidence suggests that maternal depression or stress during pregnancy is associated with brain morphology changes in young children[16] and the presence of persistent depressive symptoms often interferes with maternal-fetal/child attachment.[17] Furthermore, maternal depression may negatively impact family functioning and risk for future chronic physical and mental disease in partners and children.[15,18,19]

Given the importance of identifying women at risk for prenatal depression, much research has been conducted to identify demographic, time-related (*e.g.*, across gestational period), and psychosocial correlates and predictors of prenatal depression. Although some results are consistent, there is significant variability in findings across studies, which has been suspected to be due to variation in sampling (*e.g.*, results being compiled across studies conducted in primarily low-income clinics vs. private clinics; studies conducted with only one racial/ethnic group vs. studies with diverse samples; studies conducted in developing vs. developed countries).[15] There is clear evidence that history of depression (before pregnancy) contributes to risk for depression during pregnancy.[20] Furthermore, there is unequivocal evidence that U.S. mothers from a racial/ethnic minority group are at increased risk compared with white mothers, although it is unclear to what extent this difference is accounted for by socioeconomic correlates based on sampling, race-based discrimination,[21] differential validity in prenatal depression measurement tools across racial/ethnic groups, and whether such an effect persists in models that include history of depression (before pregnancy). Other risk factors that show univariate associations (or equivocal associations in multivariate models) with prenatal depression include education level, single parenthood, social support, history of abuse/current intimate partner abuse, general stress levels during pregnancy, and pregnancy-related complications.[9] Clearly, research aimed at further clarifying risk and protective factors of MDP is warranted, to address the high prevalence of depression during pregnancy and the myriad of associated negative correlates.

Given the importance of early identification of depressive symptoms in pregnancy to initiate appropriate treatment of MDP and minimize adverse maternal, child, and family outcomes, this study sought to build upon the current literature on the prevalence and predictors of depression in the early second trimester of pregnancy, as related to generally accepted risk factors (*e.g.*, stress, anxiety, lifetime depressive episodes)[22,23] and other less-explored risk factors (*e.g.*, age, race, income, nature of social support).[24–26] The study goals were to (1) evaluate the predictors of depression in the early second trimester of pregnancy; and (2) explore prevalence of depression in white and black women in early second trimester of pregnancy in the study's sample using two methods: symptoms consistent with a clinical diagnosis and a self-report tool of depressive symptom severity.

Materials and Methods

Design

This cross-sectional observational study evaluated psychosocial data collected in pregnant women in early second trimester, as part of a larger study (the Pregnancy, Race, Environment, and Genes [PREG] study) designed to explore how environmental and social exposures contribute to interindividual differences in the timing of birth. A sample of 230 women receiving prenatal care in obstetric clinics in Richmond, VA was recruited from 2013 to 2016 *via* word of mouth, flyers, clinician referral, and direct approach by a research nurse in obstetric clinic waiting rooms. If pregnant women expressed interest, they were provided with a brief summary of the study and a study brochure. Informed consent was obtained at the time of enrollment and women were compensated for their time to complete a 60–90-minute questionnaire. Answers were recorded on a tablet computer, using an electronic data management software.

Participants

All women were between 18 and 40 years of age with singleton pregnancies before 24 weeks gestational age who self-identified as non-Hispanic/non-Middle Eastern and as either Caucasian or African American. Due to the parent study inclusion criteria, women could not be using illicit drugs or assisted reproductive technology and had to be absent of a diagnosis of diabetes, HIV, and autoimmune disorders.

Study measures

All measures, including race, were based on self-report. Depression symptoms were assessed using the Composite International Diagnostic Interview Short Form (CIDI-SF) and the Symptom Checklist-27 (SCL-27). Anxiety and stress were assessed using the Pregnancy-Related Anxiety (PRA) Questionnaire, the Perceived Stress Scale (PSS), the Prenatal Social Environment Inventory (PSEI), and Pregnancy Risk Assessment Monitoring System (PRAMS). Social support was measured using the Medical Outcomes Study Social Support Survey (MOSSSS), respectively. Each instrument is summarized below.

Composite International Diagnostic Interview Short Form.

Two items from the CIDI-SF were used to represent a screening for depressive symptoms in pregnancy—endorsement of experiencing loss of interest (anhedonia) or feeling sad/blue/depressed for a 2-week period during the current pregnancy.[27] The full CIDI-SF depression scale for the purposes of meeting diagnostic criteria was not used in this study because it could not differentiate between symptoms during pregnancy or before pregnancy.

Symptom Checklist-27.

The SCL-27[28] uses a 5-point Likert-type scale (0–4) to assess symptoms of depression, somatization, anxiety, phobic anxiety, and sleep difficulty in the past month. Exploratory factor analysis was performed to confirm the loading and grouping of items was appropriate for use in a pregnant population. The depressive subscale was used in the present analyses, which was composed of 10 items with a possible score range of 0–40, and had acceptable internal consistency (alpha = 0.89).

Prenatal Social Environmental Inventory. The 41-question version of the Prenatal Social Environmental Inventory[29,30] was used to measure exposure to stressful life events. For each question, participants indicated whether or not they had ever experienced the event (*e.g.*, a member of your family died; you were ill for a week or more). Higher scores on a possible range of 0–41 are indicative of increasing types of stressful events experienced. Some studies group the sums into tertiles, such that a score of 0–6 suggests low stress, 7–11 suggests moderate stress, and a score of 12 or higher suggests high stress.[31] The Cronbach's alpha for the PSEI scale in this study was 0.82.

Perceived Stress Scale. The PSS (10 questions) was used to measure perceived stress and the degree it interfered with life and daily activities using a 5-point Likert-type scale, with 0 indicating ''never'' and 4 indicating ''very often.''[32] Possible scores range from 0 to 40. In addition to questions about perceived stress (*e.g.*, *In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?*), there are also questions about coping (*e.g.*, *In the last month, how often have you found that you could not cope with all the things that you had to do?*). The Cronbach's alpha for the PSS in this study was 0.78.

PRA Questionnaire. The PRA Questionnaire (10 questions) was used to assess the amount of time spent concerned about different fears, primarily childbirth, and fetal health.[33] Each question was assessed using a 4-point Likert-type scale with 0 indicating that the specific concern was not present at all and 3 indicating that the concern was present ''a lot of the time'' (possible range: 0–30). The Cronbach's alpha for the PRA in this study was 0.85.

Medical Outcomes Study Social Support Survey. The MOSSSS (19 questions) was used to measure the amount and quality of social support.[34] Each question used a 5-point Likert-type scale, with 1 indicating ''none of the time'' and 5 representing ''all of the time'' (possible range: 19–95). The Cronbach's alpha for the MOSSSS in this study was 0.98.

Pregnancy Risk Assessment Monitoring System. The PRAMS was developed by the Centers for Disease Control to collect state-specific information.[35] It was used to assess not only health-related knowledge, attitudes, and behaviors but also type of medical insurance and personal health history.

Statistical analysis

Categorical data are presented as a percentage; normally distributed continuous data are presented as a mean and standard deviation, and discrete data or non-normally distributed data are presented as a median with an interquartile range. Both logistic and linear regressions were used to assess the impact of demographic, preconception health, and psychosocial environment variables as well as descriptive data of current symptoms of depression measured by CIDI-SF and SCL. For all statistical analyses, SAS 9.4 was used, and an alpha of less than 0.05 was considered statistically significant.

Logistic regression was used to fit models predicting the probability of CIDI-SF depression. First univariate and then multivariate logistic regression analysis was used to identify independent predictors of CIDI-SF depression. Variables with a p-value <0.20 on univariate analysis were entered into a multivariate logistic regression model with backwards elimination to determine a final model with significant predictors. Overall model fit was tested using the Hosmer–Lemeshow goodness-of-fit-test. Discrimination was assessed using the area under the receiver operating characteristic curve (AUC) and the misclassification rate. Similarly, linear regression was used to fit models predicting the continuous SCL depression score. First simple and then multiple regression models were used to identify independent predictors of SCL depression score. Variables with a p-value <0.20 on univariate analysis were entered into a multivariate regression model with backwards elimination to determine a final model with significant predictors. Overall model fit was assessed using the R-squared statistic and a Likelihood Ratio test.

Results

The demographic characteristics of the 230 study subjects are presented in Table 1. On average, the women were ~29 years old ($M = 28.93$, SD = 5.13) with a gestational age between 14 and 15 weeks ($M = 14.40$, SD = 5.73). About one half of the subjects self-identified as African American (53%), married, cohabiting or in a relationship (82%), employed at least part-time (76%), and had at least some college education (67%). Twenty-four percent of the subjects had a

Table 1. Demographics

Variable	*% (n/total) or mean (SD), (n = 230)*
Age (years)	28.93 (5.13)
Gestational age (weeks)	14.40 (5.73)
Race	
White	47% (109/230)
Black	53% (121/230)
Relationship status	
Married or cohabitating	57% (129/227)
In a relationship	25% (57/227)
Single or separated or never married	18% (41/227)
Employment status	
Full-time	43% (97/227)
Part-time or student	33% (76/227)
Unemployed	24% (54/227)
Household income	
<$10k	31% (60/196)
$10k–$60k	45% (89/196)
$60k–$100k	14% (28/196)
>$100k	10% (19/196)
Education	
Less than high school	12% (26/222)
High school	21% (47/222)
Some college or college degree	47% (105/222)
Some graduate school or graduate degree	20% (44/222)
Living arrangement	
Alone	5% (11/226)
With partner/spouse/children	76% (172/226)
With friend/roommate/other	19% (43/226)

household income in excess of $60,000, while only 5% of the subjects lived alone.

Relevant preconception health history and current symptoms are summarized in Table 2. Fourteen percent of the subjects endorsed ''Yes'' on a question regarding whether they reported visiting a healthcare worker in the 12 months before pregnancy for symptoms of depression or anxiety, 20% endorsed ''Yes'' regarding being depressed or anxious in the 3 months before pregnancy, and 35% of the study subjects reported a lifetime history of depression. Nineteen percent reported episodes of feeling sad/blue for at least 2 weeks during the current pregnancy and 13% reported an episode of loss of interest/anhedonia during the current pregnancy. Eight percent reported both depressive symptoms. A SCL depression scale score of 11 was determined to be most related to meeting the depression criteria on the CIDI-SF (sensitivity 43%; specificity 85%); this score suggests an individual is at least moderately affected by depressive symptoms. Close to 20% of participants met this threshold of depressive symptoms on the SCL-27 depression subscale. Other studies have suggested a cutoff score of 17,[36] but there is no currently recognized standard cutoff score. The average score for stressful life events (on the PSEI) was 6.92, which falls on the line between low to moderate prenatal stress (typically considered to be a score of 7–11); this score is a few points lower than the mean score found in other studies using this scale, typically with populations of pregnant women presenting to an emergency department for care[31] or experiencing preterm birth.[30] The average score on the PSS was 13.81, which falls within the normal range for reproductive-age females,[32] and within the range of means (*e.g.*, 9–22) reported in other large-scale prospective observational studies of healthy pregnant women in the second trimester.[37,38] The mean pregnancy-specific anxiety score (on the PRA) was 6.55, similar to other studies of healthy pregnant women.[39,40] White participants had a lower percentage of subjects who endorsed the two CIDI-SF depressive symptom items than black participants (5% vs. 12%), although this difference was not statistically significant ($\chi^2 = 3.49$, 1 d.f., $p = 0.062$).

After screening using univariate logistic regression/linear regression, variables significant at $p < 0.05$ were entered into backward elimination regressions. The variables used for the backwards elimination logistic regression were as follows: race, marital status, employment status, education, history of visiting a healthcare provider in the past 12 months for depression or anxiety, history of depression or anxiety in the 3 months before pregnancy, lifetime history of a depressive episode, depression score on the SCL subscale, and scores on

Table 2. Preconception Health Status and Current Symptoms

	% (n/total), mean (SD) or median [range]
Preconception health history	
Reports having visited healthcare worker at some point in 12 months before pregnancy for depression or anxiety (PRAMS item)	14% (32/230)
Reports felt depressed at some point in 3 months before pregnancy (PRAMS item)	16% (37/230)
Reports experienced anxiety at some point in 3 months before pregnancy (PRAMS item)	16% (36/230)
Reports experiencing either depression or anxiety in 3 months before pregnancy (PRAMS item)	20% (47/230)
Reports a lifetime history of a depression episode (2 weeks of feeling sad/blue/depressed) before current pregnancy	35% (77/220)
Previous pregnancies (PRAMS item)	
0 pregnancies	37% (86/230)
1–2 pregnancies	28% (65/230)
3–5 pregnancies	25% (58/230)
>5 pregnancies	9% (21/230)
Median number of previous pregnancies [range]	2 [0–13]
Social support (MOSSSS total score)	3.93 (1.10)
Current symptoms	
During this pregnancy, reports having one key depressive symptom: feeling sad/blue/depressed for 2 weeks) (CIDI-SF)	19% (43/223)
During this pregnancy, reports having one key depressive symptom: loss of interest/anhedonia (CIDI-SF)	13% (29/216)
During this pregnancy, reports two key depressive symptoms: feeling sad/blue and anhedonia (CIDI-SF)	8% (18/215)
White Participant with two depressive symptoms in pregnancy	5% (5/105)
Black Participant with two depressive symptoms in pregnancy	12% (13/97)
Participants with depression score ≥11 on self-report subscale (SCL; possible range 0–40)	20% (45/230)
Average depressive symptom score on self-report subscale (SCL; possible range 0–40)	6.50 (6.71)
Stressful life events (PSEI; possible range 0–41)	6.92 (5.09)
Perceived stress (PSS; possible range 0–40)	13.81 (6.95)
Pregnancy-related anxiety (possible range 0–30)	6.55 (5.39)

CIDI-SF, Composite International Diagnostic Interview Short Form; MOSSSS, Medical Outcomes Study Social Support Survey; PRAMS, Pregnancy Risk Assessment Monitoring System; PSEI, Prenatal Social Environment Inventory; PSS, Perceived Stress Scale; SCL-27, Symptom Checklist-27.

Table 3. Final Multivariable Logistic Regression Models Predicting Depressive Symptoms on CIDI

Variable	*Estimate*	*Std Err*	*Wald* χ^2	p	*OR (95% CI)*
Income	−1.2319	0.3886	10.05	0.0015	0.292 (0.136, 0.625)
Lifetime history of a depression episode	2.3312	0.7789	8.96	0.0028	10.290 (2.236, 47.357)
Perceived stress (PSS)	0.1690	0.0643	6.92	0.0085	1.184 (1.044, 1.343)

AUC = 0.93, Sensitivity = 81% and specificity = 95%; overall misclassification rate = 5%; analytic $n = 183$.
AUC, area under the receiver operating characteristic curve.

the PSEI, PSS, and PRA. The variables used for the backwards elimination linear regression were as follows: age, living arrangement, history of visiting a healthcare provider in the past 12 months for depression or anxiety, history of depression or anxiety in the 3 months before pregnancy, lifetime history of a depression episode, and scores on the SCL depression subscale, PSEI, PSS, and PRA.

Logistic regression was used to determine predictors of depressive symptoms on the CIDI-SF items and one model arose, as shown in Table 3, which consisted of three predictors: lower income, lifetime history of a depression episode (whether the individual reported feeling sad, blue, or depressed for 2 weeks at some point in her lifetime before the pregnancy), and a higher score in perceived stress (on PSS). Due to coding issues and missing data, the analytic n of this model is $n = 183$. This model had an AUC of 0.93 with a sensitivity of 81% and a specificity of 95% with a misclassification rate of 5% (Hosmer and Lemeshow Goodness of Fit Test for this model: $\chi^2 = 5.09$, 8 d.f., $p = 0.7482$). As depicted in Table 4, we arrived at a multivariable model using linear regression to determine predictors of depression on the SCL subscale. This model had an R^2 value of 0.5025 and an adjusted R^2 value of 0.4933, with an analytic $n = 220$. Predictors included a lifetime history of a depression episode and higher scores in stressful life events (PSEI), perceived stress (PSS), and PRA.

Discussion

The aims of this study were to evaluate the prevalence of depression in early second trimester of pregnancy using items on a clinical diagnostic tool (CIDI-SF) and a self-report tool of symptom severity (SCL-depression) and to identify other relevant demographic, preconception health, or prenatal psychosocial predictors of depression. The findings from this study suggest that, in this sample of 230 black and white women at ~14 weeks gestation, MDP is as prevalent as depicted in the current literature and that the most important predictors of depression in pregnancy in this sample was preconception mental health history (a lifetime history of depressive symptoms) and perceived stress. Other relevant predictors were income, PRA, and stressful life events.

Table 4. Final Multivariable Linear Regression Models Predicting Symptom Checklist Depression

Variable	*Estimate*	*Std Err*	t	p
Lifetime history of a depression episode	2.4289	0.6910	3.51	0.0005
Stressful life events (PSEI)	0.3878	0.0727	5.33	<0.0001
Perceived stress (PSS)	0.3048	0.0533	5.71	<0.0001
Pregnancy-related anxiety	0.2367	0.0636	3.72	0.0003

$R^2 = 0.5025$; adjusted $R^2 = 0.4933$; analytic $n = 220$.
PSEI, Prenatal Social Environment Inventory.

Close to 20% of women in this study endorsed feeling sad, blue, or depressed for at least 2 weeks during the current pregnancy, which is the first question of the CIDI diagnostic survey and is a commonly used screening question in clinical practice. Similarly, 13% of participants endorsed feelings of loss of interest/anhedonia during the pregnancy. The incidence rate dropped to ~8% when requiring endorsement of both symptoms on the CIDI-SF: endorsing feelings of sad/blue and loss of interest/anhedonia, which is consistent with nationally representative studies in the literature about depression rates in pregnancy.[7,41,42] However, this rate change from 20% to 8% with the addition of a single question warrants a closer look. From a clinical perspective, it may be important to pay attention to women who have depressive symptoms even if they do not have both symptoms. Given the relationship between the onset of symptoms during pregnancy and the risk of postpartum depression, researchers and clinicians alike may need to maintain a heightened awareness of the potential for symptoms to worsen and/or eventually impact daily life, family functioning, and other negative sequelae. There may be great clinical utility to giving attention to ''subthreshold'' levels of depression in early pregnancy, which warrants further attention in future studies examining trajectories of depression throughout pregnancy. Of note, ~35% of the pregnant women in our study reported a lifetime history of a depressive episode. This rate is similar to the reported rates of lifetime depressive episodes in the literature (*e.g.*, ~16% in the general population, with incidence twice as high in women as in men).[43]

The only demographic factor which maintained significance for predicting depressive symptoms in the model was income. Given the established relationship between income and stress, the presence of this factor in the model is unsurprising. Previous studies have identified a number of factors related to depression in pregnancy, including age, current life stressors, history of depression or anxiety, nonwhite race, lower socioeconomic status, low social support, and ambivalence about pregnancy among others.[8,22,23,42–45] However, in the current study, most of these other variables were unrelated to both the clinical symptoms of depression on the CIDI-SF items and the self-reported symptom severity measure (SCL-depression). Variables related to relationship (*e.g.*, relationship status, living with a partner) were the only demographic variable with a significant relationship with depression on the SCL scale, yet, they did not remain significant in the models. Although not a demographic factor, perhaps related to relationship status, the perception of social support (MOSSSS) did have a relationship with depression on the SCL scale; however, this too did not

remain in the final models. Of note, previous studies that include both white and black participants are equivocal regarding whether demographic factors such as age and socioeconomic status are accurate predictors of depression.[24–26] The current study differed from the many other similar studies in the following ways: several studies gathered survey data late in pregnancy (*e.g.*, average gestational age 24 weeks, 33 weeks, and ''third trimester'')[8,23,45]; one study did not report gestational age at all[42]; several studies asked women to recall pregnancy details when they were in postpartum phase (*e.g.*, 72 hours after delivery)[44]; and most studies were conducted with a majority of white women.[8,44,45]

Preconception mental health, particularly a lifetime history of a major depressive episode, was clearly an important predictor of MDP in the current study. Vulnerability to recurrent depression is common and has been attributed to dysregulations related to neurobiological, cognitive, epigenetic, and other factors.[46,47] In addition, current psychosocial health status, including life stressors (PSEI), perceived stress (PSS), and PRA, was related to depressive symptoms in the sample. Our study sample appears to be a representative sample, given that the mean scores on the PSEI, PSS, and PRA were similar to those in other observational studies of generally healthy pregnant women,[37–40] which supports our assertion that these risk factors are important to consider by clinicians. Although lifetime history of major depressive episode and perceived stress were the strongest predictors of MDP, the results of this investigation highlight these other proximal risk factors for depression. There are many reasons why pregnant women at risk for depression may not identify themselves as having a history of depression: for example, stigma, fear of being labeled, lack of insight or knowledge about the condition, desire to avoid past difficulties, or attribution of depressive symptoms to another cause (*e.g.*, physical illness, fatigue, stress, or nervous problem). Thus, although they did not emerge as strong multivariate predictors across measures of depression, the more proximal risk factors, including life stressors and PRA, may be easier for some women to discuss. Providers would do well to consider these topics (assessment of life stressors and PRA) for ongoing monitoring with pregnant women. These findings are largely consistent with results of other studies, in which stress and anxiety are common comorbidities with depression symptoms.

There are a number of limitations to this study. First, the CIDI and SCL are less commonly administered during pregnancy and postpartum than questionnaires such as the EPDS and CES-D or PHQ9.[9] However, this is counterbalanced by the fact that the current study was able to evaluate depression as complex and heterogeneous, instead of a unidimensional construct, with the availability of both clinical diagnostic criteria and self-report of symptom severity measures. Furthermore, the two items used to represent depressive symptoms on the CIDI-SF are commonly used in clinical practice. Second, the study's sample size was small, which can limit generalizability of findings. However, the study contributes to the literature because the majority of other studies relating to MDP collect data on depressive symptoms either very late in pregnancy (*e.g.*, third trimester)[47,48] or only in the postpartum period.[49–52] Of the recent studies in the United States, which evaluated symptoms before the third trimester of pregnancy, the sample sizes range from $n = 215$[53] to $n = 1735$.[54]

Implications for Practice

Of great relevance to clinicians who work with pregnant women, findings from this study would suggest that two of the most important screening questions for depression in pregnancy are whether a woman has had a history of a depressive episode at any point in her lifetime and what her perceived stress levels are. This finding may contribute to the body of knowledge about the use of simple screening questions and about timing of screening in pregnancy. Despite the growing awareness of the importance of screening for perinatal depression,[5,10] the presence of depressive symptoms during pregnancy is often overlooked and undertreated. African American women, in particular, are often underidentified.[55,56] Research also is lacking regarding the ideal timing and screening interval during pregnancy.[10] The current recommendation from the American College of Obstetricians and Gynecologists is that screening for depressive symptoms should occur at least once at some point during the perinatal period, yet, clinicians are more likely to screen during the postpartum period than during pregnancy.[5] Recent evidence suggests that a third to half of women with postpartum depressive symptoms or postpartum depressive episode had an undetected prenatal onset.[57,58] Although there are a number of validated screening tools with suggested clinical cutoff scores (*e.g.*, the Edinburgh Postnatal Depression Scale [EPDS] is considered to be an accurate screening test for major depressive disorder at a cutoff score of 13), not all clinicians regularly administer screening tools during pregnancy, hence, it may be most clinically relevant to ask two simple questions: about preconception/lifetime episodes of depression (risk factor discussed above) and about experiences of feeling sad/blue or anhedonic or stress in the past 2 weeks.

Conclusion

This study contributes to the body of knowledge regarding prevalence and predictors of MDP. Lifetime history of depression and perceived stress levels were the strongest predictors of MDP in this study. However, in clinical practice, many pregnant women may not report a history of depression for a variety of reasons (*e.g.*, fear of stigma, avoidance, and cost of treatment). Thus, clinicians should be prepared to consider related topics (assessment of life stressors, perceived stress, income concerns, and PRA) for ongoing monitoring with pregnant women. Given the variance accounted for by lifetime depression, additional research into how clinicians may approach this important topic is warranted. For example, checklists given in the waiting room may be less likely to elicit endorsement compared with conversations aimed to normalize the range of depressive histories that may have relevance to obstetric health. Future research is warranted not only to evaluate longitudinal prevalence and predictors of depression during pregnancy but also to explore differences in clinical presentation and underlying biological patterns throughout pregnancy and into the postpartum period.

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