

Depressive Symptoms among Pregnant Women Screened in Obstetrics Settings

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ABSTRACT

Objectives: This study aimed to describe the prevalence of depressive symptomatology during pregnancy when seen in obstetric settings, the extent of treatment in this population, and specific risk factors associated with mood symptoms in pregnancy.

Methods: A total of 3472 pregnant women age 18 and older were screened while waiting for their prenatal care visits in 10 obstetrics clinics using a brief (10 minute) screening questionnaire. This screen measured demographics, tobacco and alcohol (TWEAK problem alcohol use screening measure), and depression measures, including the Center for Epidemiological Studies-Depression scale (CES-D), use of antidepressant medications, past history of depression, and current treatment (i.e., medications, psychotherapy, or counseling) for depression.

Results: Of women screened, 20% ($n = 689$) scored above the cutoff score on the CES-D, and only 13.8% of those women reported receiving any formal treatment for depression. Past history of depression, poorer overall health, greater alcohol use consequences, smoking, being unmarried, unemployment, and lower educational attainment were significantly associated with symptoms of depression during pregnancy.

Conclusions: These data show that a substantial number of pregnant women screened in obstetrics settings have significant symptoms of depression, and most of them are not being monitored in treatment during this vulnerable time. This information may be used to justify and streamline systematic screening for depression in clinical encounters with pregnant women as a first step in determining which women may require further treatment for their mood symptoms. As elevations in depressive symptomatology have been associated with adverse maternal and infant outcomes, further study of the impact of psychiatric treatment in gravid women is essential.

INTRODUCTION

ALMOST ONE WOMAN IN FOUR will experience depression at some point in her life,¹ most

commonly during the childbearing years.^{2,3} Women who experience depressive symptoms associated with childbearing are at greatly increased risk for future depressions over a 5-year period.⁴⁻⁶

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Self-reported maternal mood symptoms during pregnancy have been associated with poor birth outcomes, including low birth weight, increased risk of premature delivery, and pre-eclampsia in the mother,^{7,8} as well as with impaired health functioning for the mothers.⁹ Antenatal mood symptoms often predate postpartum depression,¹⁰ and mood difficulties in women with infants are associated with poor outcomes in their children.

Zuckerman et al.¹¹ found a significant association between maternal elevated Center for Epidemiological Studies-Depression (CES-D) scores during pregnancy and inconsolability and excessive crying in their infants. Beginning in the first few months of life, maternal depressive symptomatology has been shown to affect responsiveness to the child,¹² behavioral problems, and delayed cognitive and linguistic development.¹³⁻¹⁵ Many studies exploring postpartum illness do not differentiate between research diagnostic criteria for major depression and minor depression. There has been ample research in nonpregnant women to suggest that minor depression, not of sufficient duration or severity to meet the criteria for a major depressive episode, has a significant and disabling impact.¹⁶⁻¹⁹

Although there have been advances in psychopharmacological and psychotherapeutic treatment for depression, many pregnant women do not seek treatment. A recent study of mental health issues in pregnancy found that only 1 in 5 women with a psychiatric disorder in obstetrics settings had evidence of treatment in the medical charts.²⁰ Another investigation found that a diagnosis of depression was made in only 0.8% of childbearing women based on a review of diagnostic codes across a large hospital system.²¹ Studies to date have not directly examined the utility of screening for antenatal depression in obstetrics settings for optimizing rates of identification and appropriate treatment. However, the U.S. Preventive Task Force concluded recently that screening for depression in adults in primary care can improve rates of detection and treatment when adequate follow-up mechanisms are in place in the setting.²² At this point, there are no clear guidelines for appropriate treatment of antenatal and postnatal depression. However, Wisner et al.²³ have presented a risk-benefit decision-making model that incorporates a number of factors, including the risks and benefits of medication use and attitudes and

preferences of the patient, her family, and her obstetrician. The antenatal visit may provide an ideal venue for initial screening and intervention, as (1) the perinatal period is a high risk time for the emergence of depressive symptoms and (2) most pregnant women will seek prenatal care at some point during their pregnancy.

Identification of risk factors for elevated depression in pregnancy may help to target screening efforts. Previous studies have found personal and family history of mood disorder, marital conflict, younger age, and limited social support with greater number of children to be risk factors for depression in pregnancy.^{24,25} A recent study also found scores on a substance abuse screening measure to be significantly associated with antenatal depression, as measured by the Edinburgh Postnatal Depression Scale.²⁶ Other data have shown a link between depression in pregnancy and substance abuse, including smoking.^{27,28} Depression in pregnancy has been linked to lower educational attainment, unemployment, and marital status, particularly in lower-income women.²⁹ A prior history of depression is perhaps the strongest predictor of future depression.³⁰ The risk of postpartum depression in women who have histories of depression is high, with estimates ranging from 25% to 50%.²⁴

As antenatal depressive symptoms may have a negative impact on both mother and infant and may predispose women to the development of postpartum depression, three research questions were addressed in this study. First, we examined the prevalence of elevated depressive symptomatology in pregnant women as identified by screening in obstetrics settings. Second, we examined rates of reported receipt of formal treatment (i.e., medications, psychotherapy, or counseling) for depression among those who may be considered at risk for depression. Finally, we examined demographic and psychosocial risk factors associated with elevated depressive symptomatology during pregnancy in obstetrics settings.

MATERIALS AND METHODS

Procedures

As part of an ongoing intervention project, pregnant women were screened in obstetrics clinics while waiting for their prenatal care visit. A

total of 3472 pregnant women were screened in 10 obstetrics clinics in southeastern Michigan. All pregnant women were approached by research staff in the waiting area of the clinics and asked to participate, and 90% of all women approached agreed to complete the screening survey. Women who chose not to participate refused further contact with the research assistant after the initial approach. Therefore, it was not possible to collect information on their characteristics. Confidentiality was maintained by the use of randomly chosen study code numbers, and all procedures were approved by the University of Michigan Medical School Institutional Review Board. Screening measures included demographic information, ratings of overall health, lifetime and recent depression, current distress (CES-D), risk drinking (TWEAK), and use of prescription medications.

Participants

Demographic characteristics of participants are shown in Table 1. A wide range of ages was sampled (18–46 years, mean 28.6 (SD 6.0)). The racial/ethnic distribution of our sample closely reflects that of our screening county.³¹ Women were screened in the clinical settings at an average of 25 weeks of gestation (SD 10.4), with a range of 3–41 weeks. Most women were married, and most reported educational attainment beyond high school.

Measures

The screening questionnaire consisted of items assessing demographic characteristics (age, marital status, employment status, educational attainment, parity, weeks gestation, racial/ethnic status), health behaviors during pregnancy (such as overall physical health rated on a 5-point scale from poor to excellent), and use of alcohol and tobacco. Women were asked to indicate whether they had taken medication for depression in the past 2 years, whether they were currently taking the medication, and whether they had discontinued the medication as a result of becoming pregnant or during pre-pregnancy planning. The screening questionnaire also included the TWEAK as an alcohol screener.³² The TWEAK has been found to demonstrate good sensitivity and specificity in screening for risk drinking in women and during pregnancy,³³ using a cutoff score of 2. It is a 5-item measure, from which a total severity score may be derived.

TABLE 1. DEMOGRAPHIC AND HEALTH-RELATED CHARACTERISTICS OF STUDY SAMPLE ($n = 3472$)

| <i>Characteristic</i> | <i>Result</i> |
|----------------------------------|-------------------------|
| Maternal age (years) | 28.6 ± 6.0 ^a |
| Parity | 0.87 ± 1.1 ^a |
| Weeks pregnant at screening | 25 ± 10.4 ^a |
| Cigarettes smoked per day | 0.38 ± 1.0 ^a |
| Marital status (%) | |
| Married | 74 |
| Live-in partner | 10 |
| Never married | 13 |
| Divorced | 1.4 |
| Separated | 1.3 |
| Widowed | 1 |
| Race/ethnicity (%) | |
| Caucasian | 73 |
| African American | 13.3 |
| Asian American | 5.7 |
| Hispanic/Latina | 2.4 |
| Native American | 0.7 |
| Other | 2.4 |
| Education (%) | |
| < 8th grade | 0.6 |
| Grades 9–11 | 8 |
| High school graduate | 22 |
| Some college | 19 |
| College graduate | 28 |
| Beyond college | 23 |
| Employed (%) | |
| No | 41 |
| Part time | 19 |
| Full time | 40 |
| Elevated TWEAK score (%) | |
| No | 89.7 |
| Yes | 10.3 |
| Elevated depressive symptoms (%) | |
| No | 79.6 |
| Yes | 20.4 |

^aMean ± SD.

Current depressive symptomatology was measured by the CES-D. The CES-D is used widely as a screening instrument to detect depression in nonclinical populations and has been found to have adequate sensitivity in identifying a diagnosis of major depression based on an interview using the Structured Interview for the DSM-III-R in a primary care population of adult men and women.³⁴ Items on the CES-D cover the previous 7 days and are rated on a 4-point scale. A total score is derived by summing the ratings across the 20 items. Good internal consistency (Cronbach's alpha = 0.84) has been found for the CES-D in the general population³⁵ and with pregnant women (0.88–0.91).³⁶ The standard cutoff point of 16 was used to determine elevated distress.³⁷ This cutoff point has been used as an indicator of clin-

ically significant elevated depressive symptomatology in community samples³⁸ as well as with pregnant women.^{36,39}

Measures of past history of depression and treatment for depression were also included in the screening questionnaire. Past history was measured using items focusing on depression that were derived from the Diagnostic Interview Schedule (DIS-III-R).⁴⁰ These items included questions assessing lifetime depression and recent depression (within the last 6 months) by asking participants if within the specified time frame, “. . . you had two weeks or more when nearly every day you felt sad, blue, or depressed or in which you lost all interest in things like work?” The sensitivity of these items as screeners for depression were found to range between 0.83 and 0.94.⁴¹ Finally, current treatment for depression was assessed with two items. Women were asked to indicate if they were currently receiving counseling, psychotherapy, or medication for depression or emotional problems (dichotomously coded, yes/no). A second item asked women to indicate the number of sessions they have had with a counselor or therapist for depression in the last 3 months.

Data analysis plan

Descriptive information on study participants was examined and is shown in Table 1. We were also interested in descriptive information on depression-related items, such as rates of past history of depression and rates of current treatment for depression among those at risk (as measured by self-reports of depression in the past 6 months and by current elevated CES-D). Therefore, prevalence of this depression-related information was also examined for our sample.

The primary analyses for this study focused on demographic and health behavior variables associated with elevated depressive symptomatology, as measured by CES-D. Bivariate logistic regression was used to examine the factors associated with elevated depression. Women were divided into two groups based on their CES-D score, ≥ 16 and < 16 , and this was used as the outcome variable in the analyses. Independent variables were selected based on previously studied demographic and health-related correlates of perinatal depression. The independent variables were maternal age, marital status, education, racial/ethnic status, employment status, parity, number of

weeks gestation, lifetime history of depression, self-rated overall health, smoking during pregnancy, and alcohol use problems as measured by TWEAK. Independent variables were entered simultaneously in a single equation. This method allows for examination of the association of each independent variable to the outcome variable after controlling for all other variables in the equation. Thus, the influence of each variable on the outcome variable is calculated above and beyond every other variable in the equation.⁴² Overall model and individual variable statistics are presented along with odds ratios (ORs) for significant factors.

RESULTS

Descriptions of depression

Overall, 20.4% ($n = 689$) of pregnant women screened showed elevated depressive symptomatology as measured by a CES-D score of ≥ 16 . Of these women, 13.8% ($n = 91$) reported that they currently were receiving any kind of formal treatment for depression (defined as any psychotherapy, medications, or counseling). The majority of women with elevated CES-D reported receiving no session with a counselor or therapist in the past 3 months (85%), and 7% reported less than one session per month with a counselor or therapist in the past 3 months. Of those who reported depression in the past 6 months (8.6%, $n = 297$) (as measured by 2 weeks or more of feeling sad, blue, depressed or losing all interest in things such as work), 24.6% reported currently receiving any form of treatment for depression. Given the high risk of relapse among those with any prior history of depression, we were also interested in the rates of elevated depressive symptomatology among women with a past history. A total of 958 (28%) women reported a lifetime history of major depression (as measured by 2 weeks or more of feeling sad, blue, depressed or losing all interest in things such as work). Of those, 42.6% ($n = 398$) reported current elevated depressive symptomatology (based on CES-D cutoff ≥ 16).

Factors associated with elevated depressive symptomatology

Bivariate logistic regression analysis was performed using elevated CES-D as the outcome variable, with the following independent variables: maternal age, marital status, race/ethnic-

ity, education (i.e., number of years of school completed), maternal employment status, number of weeks gestation, parity, lifetime history of depression (yes/no), self-rated overall health, alcohol use problems as measured by TWEAK, and number of cigarettes smoked per day during pregnancy. The overall chi-square for the model was found to be significant (chi-square = 559(11), $p = 0.000$). Residuals and goodness-of-fit were checked in the final model (Hosmer and Lemeshow test chi-square p value = 0.86). There was no evidence of lack of fit in the final model.

Logistic regression statistics, including standardized coefficients, p values, and ORs associated with each study variable, are presented in Table 2. Holding all other factors constant, women who reported a prior history of depression were 4.9 times more likely to have an elevated CES-D than women who reported no such history. Women who rated their overall health as poorer, who had greater alcohol use problems (as measured by TWEAK), and who smoked more cigarettes per day while pregnant were significantly more likely to have elevated CES-D. (OR = 1.5, 1.2, and 1.1, respectively). Women with lower educational attainment, those who were not working, and those unmarried or without a live-in partner were also significantly more likely to have elevated depressive symptomatology (OR = 0.90, 0.74, and 0.57, respectively). Maternal age, parity, number of weeks gestation, and race/ethnicity were found to be unrelated to CES-D.

DISCUSSION

Our data show that a substantial number (20%) of pregnant women screened antenatally in obstetrics settings reported significant depressive symptomatology. Most (86%) were not receiving any treatment (defined as medication, psycho-therapy, or counseling) during this vulnerable time. Routine monitoring for depression does not occur in most obstetrics settings, including those used as the study sites. Thus, although not directly assessed, it is likely that these women were not being monitored by a healthcare professional for possible worsening of symptoms. Almost half of the women in our sample with a self-reported past history of major depressive disorder (MDD) (42.5%) reported recurrence of mood symptoms during the pregnancy.

Although the impact of mood symptoms on the developing fetoplacental unit has not been fully elucidated, preliminary human and animal studies suggest that untreated psychiatric symptoms may impact the developing fetus and adversely affect neonatal outcome.^{7,43-46} Thus, antenatal screening in this population may identify women who may be at risk for such adverse pregnancy outcomes as prematurity and preeclampsia, enabling appropriate obstetric surveillance. As many women who develop postpartum depression have antecedent symptoms during pregnancy, screening for mood symptoms during pregnancy may also identify women at high risk for postpartum depression.⁴⁷

TABLE 2. STANDARDIZED REGRESSION COEFFICIENTS, STATISTICS, p VALUES, AND ODDS RATIOS FOR VARIABLES PREDICTING ELEVATED DEPRESSIVE SYMPTOMATOLOGY^a AS IN PREGNANT WOMEN SCREENED IN OBSTETRICS SETTINGS ($n = 2991$)^b BASED ON BIVARIATE LOGISTIC REGRESSION

| Variable | B | Wald | p value ^c | Odds ratio |
|------------------------------|-------|-------|----------------------|------------|
| Maternal age | -0.02 | 2.6 | NS | — |
| Marital status | -0.56 | 15.6 | 0.00 | 0.57 |
| Minority | 0.10 | 0.69 | NS | — |
| Education | -0.10 | 4.0 | 0.04 | 0.90 |
| Employment status | -0.30 | 7.5 | 0.01 | 0.74 |
| No. of weeks gestation | 0.00 | 0.06 | NS | — |
| Parity | 0.06 | 1.5 | NS | — |
| Lifetime depression (yes/no) | 1.6 | 241.5 | 0.00 | 4.9 |
| Self-rated health | 0.39 | 40.2 | 0.00 | 1.5 |
| TWEAK | 0.211 | 18.9 | 0.00 | 1.2 |
| Smoking while pregnant | 0.13 | 8.7 | 0.00 | 1.1 |

^aCenter for Epidemiological Studies-Depression Scale cutoff score < 16 or ≥ 16 .

^b n is smaller than total sample because of listwise deletion of missing variables included in the logistic regression analysis.

^cSignificance levels based on $p < 0.05$.

In fact, screening for depression in obstetrics settings appears to be feasible, as we were able to obtain surveys on 3472 pregnant women in 10 clinics over a 3-year period. The majority of women approached (90%) agreed to complete the screening survey. Our study demonstrated that administration and scoring of screening tools can be done successfully by nonclinical staff (in this study, undergraduate research assistants).

The efficiency of screening in obstetrics may be improved by identification of risk factors for depressive symptomatology and depression risk. We found several factors to be strongly predictive of depressive symptoms during pregnancy. These include previous episodes of major depressive illness, poor self-rated health, and greater alcohol use and use of cigarettes while pregnant. Demographic factors, such as not living with a spouse/significant other, not working, and less education, were also significantly related to elevated symptoms of depression during pregnancy. Other demographic and socioeconomic factors as well as health behaviors, such as age, parity, stage of pregnancy, and race, were not correlated with pregnancy-related depression. As has been found in other studies of predictors of postnatal depression, self-reported prior history of depression was most strongly related to elevated depressive symptomatology during pregnancy.⁴⁸ Thus, women with a past history of depression should be targeted for more intensive assessment during early pregnancy. Similarly, as our data suggest, it may be useful for physicians or other clinical staff to flag those not working, those unmarried, those with greater health complaints, and those who use alcohol and cigarettes as possible markers of elevated depression.

Such women represent a critical subpopulation who could benefit from more intensive assessment and intervention. More research is needed on optimal and appropriate treatment for women with antenatal minor or major depression. In the meantime, women, their families, and their physicians should be made aware of current knowledge on the safety and efficacy of pharmacological and psychotherapeutic treatments. For example, interpersonal psychotherapy has been found to be efficacious for the treatment of postnatal depression.⁴⁹ A risk-benefit model of treatment decision making that considers a variety of factors related to the well-being of the mother and infant has been proposed.²³

Several limitations should be noted in inter-

preting the results of this study. First, research assistants were used to collect screening data, which raises questions about the generalizability of implementation of large-scale screening efforts. Women were largely receptive to completing a brief screening survey while they waited for their prenatal care visits. However, future studies should examine the feasibility of implementation by clinical or clerical staff. Second, our study used measures of self-report for depression symptomatology and did not obtain diagnoses of MDD. Moreover, the study included only a single time for assessment of mood symptoms, collecting the self-report at variable times during the pregnancy (3–41 weeks) and not monitoring the course of the illness *per se*. Although distress and minor depression can be very debilitating and are associated with adverse pregnancy outcomes, additional work on the prevalence of MDD and its impact during pregnancy must be completed. Although the majority of those at risk reported not receiving any treatment, it is unclear if all of these women would necessarily benefit from treatment. We also do not have more specific information on any treatment or healthcare related to depression beyond the use of medications, psychotherapy, or counseling. Although these represent the treatment options for depression that have received the most study, there may be other types of interventions that women use that may be useful for their symptoms (e.g., religious advisement). Future studies may identify predictors of response to treatment along the continuum of depression. The impact of such treatment interventions on fetal and infant neurodevelopment must be further explored as well. Data obtained from this project highlight that depressive symptomatology is common in obstetrics settings. Research and clinical emphasis on appropriately targeted treatment will likely improve symptoms and overall functioning of these women and may help to minimize the adverse consequences of maternal mood symptoms on pregnancy outcomes.

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