Psychiatric Disorders in Pregnant and Postpartum Women in the United States

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**Context:** Psychiatric disorders and substance use during pregnancy are associated with adverse outcomes for mothers and their offspring. Information about the epidemiology of these conditions in this population is lacking.

**Objective:** To examine sociodemographic correlates, rates of DSM-IV Axis I psychiatric disorders, substance use, and treatment seeking among past-year pregnant and postpartum women in the United States.

**Design:** National survey.

**Setting:** Face-to-face interviews conducted in the 2001-2002 National Epidemiologic Survey on Alcohol and Related Conditions.

**Participants:** A total of 43,093 respondents were interviewed, of whom 14,549 were women 18 to 50 years old with known past-year pregnancy status.

**Main Outcome Measures:** Prevalence of 12-month DSM-IV Axis I psychiatric disorders, substance use, and treatment seeking.

**Results:** Past-year pregnant and postpartum women had significantly lower rates of alcohol use disorders and any substance use, except illicit drug use, than nonpregnant women. In addition, currently pregnant women had a lower risk of having any mood disorder than nonpregnant women. The only exception was the significantly higher prevalence of major depressive disorder in postpartum than in nonpregnant women. Age, marital status, health status, stressful life events, and history of traumatic experiences were all significantly associated with higher risk of psychiatric disorders in pregnant and postpartum women. Lifetime and past-year treatment-seeking rates for any psychiatric disorder were significantly lower among past-year pregnant than nonpregnant women with psychiatric disorders. Most women with a current psychiatric disorder did not receive any mental health care in the 12 months prior to the survey regardless of pregnancy status.

**Conclusions:** Pregnancy per se is not associated with increased risk of the most prevalent mental disorders, although the risk of major depressive disorder may be increased during the postpartum period. Groups of pregnant women with particularly high prevalence of psychiatric disorders were identified. Low rates of maternal mental health care underscore the need to improve recognition and delivery of treatment for mental disorders occurring during pregnancy and the postpartum period.

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United States. Furthermore, we know of no previous study that included nonpregnant women of comparable age drawn from the general population to identify the specific contribution of pregnancy or the postpartum period to the risk of psychiatric disorders. Many studies were limited by use of screening scales rather than diagnostic measures for DSM-IV criteria. Finally, previous studies assessed only mood and anxiety disorders rather than a broader range of psychiatric disorders.

As the result of these gaps in research on mental disorders during pregnancy and the postpartum period, accurate national information on the mental health of pregnant women is lacking. Such information is needed for focused planning at the national and local level, and to inform the development of prevention and intervention programs. The current study addresses these critical gaps in knowledge. In a nationally representative sample of pregnant women, we present 12-month prevalence of DSM-IV psychiatric disorders, compare these with the prevalence of psychiatric disorders in nonpregnant women of childbearing age, identify risk factors for such disorders, and provide estimates of lifetime and 12-month rates of treatment seeking among pregnant and nonpregnant women with DSM-IV psychiatric disorders.

METHODS

SAMPLE

The 2001-2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) is a nationally representative sample of the adult population of the United States conducted by the US Census Bureau, which administered face-to-face interviews under the direction of the National Institute on Alcohol Abuse and Alcoholism, as described in detail elsewhere. The NESARC target population was the civilian, noninstitutionalized population, 18 years or older, residing in households in the 50 states and the District of Columbia. This included persons living in households and the following noninstitutional group quarters: boarding houses, rooming houses, nontransient hotels and motels, shelters, facilities for housing workers, college quarters, and group homes. The final sample included 43,093 respondents drawn from individual households and group quarters. Blacks, Hispanics, and young adults (aged 18 to 24 years) were oversampled. Data were adjusted to account for oversampling and respondent and household nonresponse.

The overall survey response rate consists of 3 parts. The household response rate was 89%. Households were considered nonresponse when no interview was obtained from the household and a single person was never selected. The person response rate was 93%. Person nonresponse occurred when a single person was selected but was not interviewed. The NESARC estimates were adjusted at the household and person level to account for nonresponse from refusals, absences, and unlocated housing units. The sample frame response rate was 99%. The overall response rate in the NESARC (81%) is derived by multiplying the NESARC household response rate (80%) by the NESARC person response rate (93%) and the sample frame response rate (99%). The weighted data were then adjusted using the 2000 Decennial Census, to be representative of the US civilian population for a variety of sociodemographic variables.

Women in the NESARC were asked whether they were pregnant at the time of the interview and whether they had been pregnant at any point in the preceding 12 months. There were 14,895 women of childbearing age (18 to 50 years) in the NESARC sample. Of these, 346 did not know their past-year pregnancy status and were removed from the analysis. Another 1524 women were pregnant at the time of the survey or had been pregnant in the preceding 12 months (referred to as “past-year pregnant women”). Of these, 453 were pregnant at the time of the survey (“currently pregnant”), 5 did not know their current pregnancy status (but had been pregnant in the past year), and 1066 had been pregnant during the preceding 12 months but were not pregnant at the time of the interview. Of these, 1066 women, 72 reported currently having no children. For analyses of postpartum women, these 72 were removed, leaving a total sample of 994 “postpartum women.” All remaining women in the NESARC aged 18 to 50 years were included in the “nonpregnant women” group (n=13,025).

All potential NESARC respondents were informed in writing about the nature of the survey, the statistical uses of the survey data, the voluntary aspect of their participation, and the federal laws that rigorously provided for the strict confidentiality of the identifiable survey information. Respondents consenting to participate after receiving this information were interviewed. The research protocol, including informed consent procedures, received full ethical review and approval from the US Census Bureau and the US Office of Management and Budget.

INTERVIEWER TRAINING

Interviews were conducted by approximately 1800 professional lay interviewers from the US Census Bureau. On average, the interviewers had 3 years of experience in the administration of census and other health-related national surveys. Training was standardized under the direction of the National Institute on Alcohol Abuse and Alcoholism. All interviewers completed a 5-day self-study course followed by a 5-day in-person training session at one of the US Census Bureau’s regional offices. For quality control purposes and to assess the accuracy of the interviewers’ performance, 2637 respondents were readministered 1 to 3 sections of the NESARC interview to verify answers. These interviews also formed the basis of a test-retest reliability study of Wave 1 NESARC measures.

DIAGNOSTIC ASSESSMENT

Sociodemographic measures included age, sex, race/ethnicity, nativity, marital status, urbanicity of residence, and region of the country. Socioeconomic measures included education, personal annual income, and insurance type. To be consistent with previous research, women were categorized as being older than 25 years or 25 years or younger.

All diagnoses, except psychotic disorder, were made according to the DSM-IV criteria using the National Institute on Alcohol Abuse and Alcoholism’s Alcohol Use Disorder and Associated Disabilities Interview Schedule—DSM-IV Version (AUDADIS-IV), a valid and reliable fully structured diagnostic interview designed for use by professional interviewers who are not clinicians. Axis I diagnoses included in the AUDADIS-IV can be separated into 3 groups: (1) substance use disorders (including alcohol abuse or dependence, any drug abuse or dependence, and nicotine dependence); (2) mood disorders (including major depressive disorder, dysthymia, and bipolar disorder); and (3) anxiety disorders (including panic disorder, social anxiety disorder, specific phobia, and generalized anxiety disorder). The test-retest reliability and validity of AUDADIS-IV measures of DSM-IV disorders have been reported elsewhere. Owing to concerns about the validity of psychotic diagnoses in general population surveys as well as the length of the interview, possible psychotic disorders were
indicated by asking the respondents whether they had ever been told by a doctor or other health professional that they had schizophrenia or a psychotic disorder.

We also included variables measuring any substance use, any alcohol use, and any tobacco use in the past 12 months.

The reliability of the alcohol consumption and drug use measures have been documented elsewhere. The number of stressful life events was measured with 12 items from the Social Readjustment Rating Scale, eg, fired from a job or forced to move. Additional questions queried pregnancy complications (eg, "Did

Table 1. Twelve-Month Percentage Distributions and ORs of Sociodemographic Characteristics by Pregnancy Status

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Nonpregnant Women (n=13,025)</th>
<th>Past-Year Pregnant Women (n=1,524)</th>
<th>OR (95% CI)</th>
<th>Postpartum Women, b % (SE) OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>67.0 (1.9)</td>
<td>57.2 (2.4)</td>
<td>1 [Reference]</td>
<td>55.5 (2.8) 1 [Reference]</td>
</tr>
<tr>
<td>Black</td>
<td>13.2 (0.8)</td>
<td>14.2 (1.2)</td>
<td>1.25 (1.04-1.51)</td>
<td>14.4 (1.4) 1.32 (1.08-1.61)</td>
</tr>
<tr>
<td>Native American</td>
<td>2.1 (0.2)</td>
<td>2.8 (0.6)</td>
<td>1.57 (0.96-2.57)</td>
<td>2.8 (0.7) 1.63 (0.94-2.82)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>4.9 (0.6)</td>
<td>6.1 (1.0)</td>
<td>1.47 (1.06-2.02)</td>
<td>5.5 (0.9) 1.35 (0.92-1.97)</td>
</tr>
<tr>
<td>Native</td>
<td>12.9 (1.4)</td>
<td>19.7 (2.5)</td>
<td>1.80 (1.48-2.18)</td>
<td>21.8 (3.0) 2.05 (1.61-2.60)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married or cohabiting</td>
<td>59.6 (0.7)</td>
<td>76.2 (1.5)</td>
<td>1 [Reference]</td>
<td>75.4 (1.9) 1 [Reference]</td>
</tr>
<tr>
<td>Widowed, separated, or divorced</td>
<td>13.4 (0.4)</td>
<td>4.7 (0.6)</td>
<td>0.27 (0.21-0.36)</td>
<td>5.9 (0.9) 0.35 (0.25-0.49)</td>
</tr>
<tr>
<td>Never married</td>
<td>27.0 (0.7)</td>
<td>19.2 (1.4)</td>
<td>0.35 (0.45-0.68)</td>
<td>18.7 (1.8) 0.55 (0.42-0.71)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; High school</td>
<td>11.2 (0.7)</td>
<td>17.1 (1.3)</td>
<td>1 [Reference]</td>
<td>18.6 (1.7) 1 [Reference]</td>
</tr>
<tr>
<td>High school</td>
<td>27.0 (0.6)</td>
<td>26.3 (1.3)</td>
<td>0.64 (0.53-0.77)</td>
<td>24.9 (1.6) 0.55 (0.44-0.71)</td>
</tr>
<tr>
<td>College or higher</td>
<td>61.9 (0.8)</td>
<td>56.6 (1.7)</td>
<td>0.60 (0.51-0.70)</td>
<td>56.5 (2.1) 0.55 (0.44-0.68)</td>
</tr>
<tr>
<td>Personal annual income, $</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-19,999</td>
<td>56.1 (0.8)</td>
<td>69.8 (1.5)</td>
<td>1 [Reference]</td>
<td>72.9 (1.6) 1 [Reference]</td>
</tr>
<tr>
<td>20,000-34,999</td>
<td>22.6 (0.5)</td>
<td>16.9 (1.2)</td>
<td>0.60 (0.51-0.72)</td>
<td>15.5 (1.4) 0.53 (0.43-0.66)</td>
</tr>
<tr>
<td>35,000-69,999</td>
<td>17.5 (0.6)</td>
<td>10.3 (1.0)</td>
<td>0.47 (0.39-0.58)</td>
<td>8.7 (1.0) 0.38 (0.30-0.50)</td>
</tr>
<tr>
<td>70,000+</td>
<td>3.7 (0.3)</td>
<td>3.0 (0.5)</td>
<td>0.63 (0.44-0.91)</td>
<td>2.9 (0.6) 0.59 (0.38-0.93)</td>
</tr>
<tr>
<td>Urbanicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>62.7 (2.6)</td>
<td>58.5 (3.3)</td>
<td>1.19 (1.00-1.42)</td>
<td>40.1 (3.4) 1.13 (0.92-1.39)</td>
</tr>
<tr>
<td>Urban</td>
<td>37.3 (2.6)</td>
<td>41.5 (3.3)</td>
<td>1 [Reference]</td>
<td>59.9 (3.4) 1 [Reference]</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>19.6 (3.5)</td>
<td>18.5 (3.9)</td>
<td>0.87 (0.69-1.11)</td>
<td>17.1 (3.9) 0.83 (0.61-1.13)</td>
</tr>
<tr>
<td>Midwest</td>
<td>22.9 (3.4)</td>
<td>23.1 (3.7)</td>
<td>0.93 (0.75-1.15)</td>
<td>24.1 (3.8) 1.00 (0.77-1.30)</td>
</tr>
<tr>
<td>South</td>
<td>35.2 (3.5)</td>
<td>34.3 (3.8)</td>
<td>0.89 (0.74-1.09)</td>
<td>35.3 (4.1) 0.95 (0.76-1.19)</td>
</tr>
<tr>
<td>West</td>
<td>22.3 (3.7)</td>
<td>24.1 (4.4)</td>
<td>1 [Reference]</td>
<td>23.5 (4.5) 1 [Reference]</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nullipara</td>
<td>32.9 (0.7)</td>
<td>17.8 (1.3)</td>
<td>0.44 (0.36-0.53)</td>
<td>100 (0.0) NA</td>
</tr>
<tr>
<td>Multipara</td>
<td>67.1 (0.7)</td>
<td>82.3 (1.3)</td>
<td>1 [Reference]</td>
<td>0 (0.0) NA NA</td>
</tr>
<tr>
<td>Insurance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>68.8 (1.0)</td>
<td>57.2 (1.9)</td>
<td>0.89 (0.74-1.07)</td>
<td>55.4 (2.3) 0.80 (0.64-1.01)</td>
</tr>
<tr>
<td>Public</td>
<td>8.5 (0.4)</td>
<td>21.6 (1.5)</td>
<td>2.72 (2.20-3.37)</td>
<td>21.9 (1.7) 2.58 (1.99-3.33)</td>
</tr>
<tr>
<td>None</td>
<td>22.8 (0.8)</td>
<td>21.3 (1.5)</td>
<td>1 [Reference]</td>
<td>22.8 (2.0) 1 [Reference]</td>
</tr>
<tr>
<td>Overall health (good, very good, or excellent)</td>
<td>89.6 (0.4)</td>
<td>93.4 (0.7)</td>
<td>1.92 (1.49-2.46)</td>
<td>94.3 (0.9) 1.93 (1.39-2.69)</td>
</tr>
<tr>
<td>Stressful life events</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean No. of stressful life events</td>
<td>1.8 (0.0)</td>
<td>2.0 (0.1)</td>
<td>1.08 (1.04-1.12)</td>
<td>2.1 (0.1) 1.11 (1.06-1.17)</td>
</tr>
<tr>
<td>Breakup of romantic relationship, separation, or divorce in past 12 mo</td>
<td>8.2 (0.3)</td>
<td>8.8 (0.8)</td>
<td>1.08 (0.87-1.35)</td>
<td>9.6 (1.1) 1.19 (0.91-1.55)</td>
</tr>
<tr>
<td>History of trauma or victimization in past 12 mo</td>
<td>4.6 (0.2)</td>
<td>5.3 (0.6)</td>
<td>1.18 (0.92-1.53)</td>
<td>4.7 (0.7) 1.04 (0.75-1.44)</td>
</tr>
</tbody>
</table>

Abbreviations: CI, confidence interval; NA, not applicable; OR, odds ratio.

a Past-year pregnant women includes both currently pregnant and postpartum women.
b Postpartum women includes women who were not currently pregnant but had been pregnant in the past 12 months.
c One or more children.
d Overall health status assessed self-reported perception of the respondents’ health. Respondents were asked, “In general, would you say your health is excellent, very good, good, fair, or poor?”
e Odds of having a psychiatric disorder with each additional stressful life event in the past 12 months.
f History of trauma and victimization in the past 12 months was defined as being personally the victim of a crime or attempted crime, such as being beaten up, mugged or attacked by a stranger or someone they knew, hit, threatened, or forced to have sex.
you experience/have you experienced any complications with your pregnancy?"), parity, and overall health status (eg, "In general, would you say your health is excellent, very good, good, fair, or poor?"). Also, respondents were classified as having a history of trauma and victimization in the past 12 months if they had personally been the victim of a crime or attempted crime, such as having been beaten up, mugged, or attacked by a stranger or someone they knew; hit; threatened; or forced to have sex.

To estimate rates of mental health service utilization, respondents with psychiatric disorders were classified as receiving treatment if they sought help from a counselor, therapist, physician, or psychologist, or from an emergency department; if they were hospitalized for psychiatric reasons at least 1 night; or if they were prescribed medications. Treatment utilization questions were disorder-specific. Analyses were conducted on those who were diagnosed as having the disorder of interest in the time frame under consideration. For instance, prevalence of past-year treatment seeking for a mood disorder was calculated among those with a past-year diagnosis of a mood disorder by means of treatment utilization questions specifically asked about treatment for a mood disorder.

STATISTICAL ANALYSES

Weighted cross-tabulations were used to calculate prevalence rates for each study group. A series of logistic regression analyses yielded odds ratios, indicating associations between pregnancy status and (1) sociodemographic characteristics, (2) each specific 12-month psychiatric disorder, and (3) 12-month and lifetime mental health service utilization. In these 3 sets of analyses, nonpregnant women served as the reference group. The logistic regression analyses of the associations between pregnancy status and each 12-month psychiatric disorder are presented without adjustment, and also adjusted for sociodemographic characteristics, previous history of that disorder (occurring prior to the past 12 months), overall health, and number of stressful life events. Finally, a series of logistic regression analyses yielded odds ratios indicating associations between sociodemographic characteristics and any 12-month psychiatric disorder among pregnant women, using pregnant women without any 12-month psychiatric disorder as the reference group. Standard errors and 95% confidence limits for all analyses were estimated with SUDAAN, which is statistical software that adjusts for the design characteristics of the survey.

To guard against the possibility of variations in the results due to different definitions of the sample of interest, identical analyses were conducted separately for the 3 different samples, past-year pregnant women, currently pregnant women, and postpartum women (using the same nonpregnant group as the reference group in all analyses for the 3 samples). We present herein the analyses conducted on the largest group (past-year pregnant women) and indicate the main differences with the analyses of the other 2 samples (currently pregnant women and postpartum women). Full results of the analysis of the sample of currently pregnant women are available as supplementary material (eTables 1, 2, 3, and 4 [http://www.archgenpsychiatry.com]).

RESULTS

SOCIO DEMOGRAPHIC CHARACTERISTICS

The distributions of sociodemographic characteristics by pregnancy status are shown in Table 1. Compared with nonpregnant women, past-year pregnant women were more likely to be Hispanic, black, or Asian; to be foreign born; to be between the ages of 18 and 25 years; and to have public insurance. In addition, past-year pregnant women were more likely than nonpregnant women to have a higher number of stressful life events and to report good to excellent overall health. Conversely, past-year pregnant women were significantly less likely than nonpregnant women to be widowed, separated, divorced, or never married; to have more than a high school education; to have earned $20 000 or more in the past year; and to be nulliparous.

RATES OF DSM-IV AXIS I DISORDERS

Twelve-month rates of specific DSM-IV psychiatric disorders by pregnancy status are shown in Table 2. Twelve-month prevalence of psychiatric disorders ranged from 0.4% (any psychotic disorders) to 14.6% (any substance use disorder) in past-year pregnant women and from 0.3% to 19.9% for the same diagnoses in nonpregnant women. Adjusted odds ratios revealed that past-year pregnant women were significantly less likely than nonpregnant women to have been diagnosed as having any substance use disorder, including alcohol and other drug use disorders and nicotine dependence, and any psychiatric disorder. Past-year pregnant women also had lower rates of any alcohol use and any tobacco use, but not any illicit drug use.

SOCIO DEMOGRAPHIC PREDICTORS OF PSYCHIATRIC DISORDERS AMONG PAST-YEAR PREGNANT WOMEN

Table 3 shows percentage distributions and odds ratios for sociodemographic characteristics for past-year pregnant women with and without any 12-month DSM-IV psychiatric disorders. Being 18 to 25 years old; never being married or being widowed, separated, or divorced; and reporting pregnancy complications, current stressful life events, breakup of a romantic relationship, and history of trauma or victimization within the past 12 months were associated with higher rates of psychiatric disorders in past-year pregnant women. Furthermore, compared with past-year pregnant women without psychiatric disorders, past-year pregnant women with psychiatric disorders were significantly less likely to report good to excellent overall health.

MENTAL HEALTH SERVICE UTILIZATION AMONG PAST-YEAR PREGNANT AND NONPREGNANT WOMEN

The odds of past-year treatment seeking for mood disorders among women with a past-year diagnosis of a mood disorder were significantly lower in past-year pregnant women than in nonpregnant women (Table 4).

ANALYSES OF CURRENTLY PREGNANT WOMEN AND POSTPARTUM WOMEN

Although there were some minor differences between identical analyses of past-year pregnant women and those
highlight 4 major results: (1) although rates of Axis I psychiatric disorders, including substance use, mood, and anxiety disorders, are high in women of childbearing age regardless of pregnancy status, pregnancy per se is not associated with an increased risk of new onset or recurrence of the most prevalent mental disorders, and is associated with lower rates of substance use, except illicit drug use, and substance use disorders; (2) the risk of major depressive disorder may be increased during the postpartum period, whereas the risk of any mood disorder appears to be decreased in currently pregnant women; (3) younger age, not being married, exposure to traumatic or stressful life events in the past 12 months, pregnancy complications, and overall poor health increase the risk of mental disorders in past-year pregnant women; and (4) psychiatric treatment rates among pregnant women with psychiatric disorders are very low.

Although high rates of psychiatric disorders have been reported in clinical samples of pregnant and postpartum women, the specific contribution of pregnancy to the prevalence of psychiatric disorders in women of childbearing age had not been previously examined. In our study, the overall 12-month rate of psychiatric disorders in pregnant and postpartum women was high, but no differences were found in the overall prevalence of psychiatric disorders, pregnancy status, and demographic characteristics among pregnant and postpartum women.
specific psychiatric disorders between past-year pregnant and postpartum and nonpregnant women, except for the prevalence of substance use disorders, which was lower in past-year pregnant and postpartum women than in nonpregnant women of childbearing age. Our results are in accord with most,3,5,7,8,44,65 although not all,47 studies derived from clinical samples, but are important because they extend these findings to the general population. Clinical studies have suggested that trimester of pregnancy affects the rates of psychiatric symptoms, with some studies suggesting an exacerbation of psychiatric disorders in the first 2 trimesters of pregnancy,55 while...
others have reported greater rates of depressive disorders during the second and third trimesters of pregnancy.\textsuperscript{18,64} The NESARC did not collect data on month during the second and third trimesters of pregnancy. Our finding is consistent with most previous studies,\textsuperscript{2-5,9} although a lack of increase in prevalence of major depressive disorder during the postpartum period and the decreased likelihood of having any mood disorder in currently pregnant women. Biological (eg, hormonal) as well as psychological and social role changes associated with childbirth may increase the risk of major depressive disorder during the postpartum period. Furthermore, women with psychiatric illness who become pregnant may discontinue their psychiatric medication for fear of prenatal exposure of offspring to these agents, thereby increasing the risk of depressive relapse during pregnancy or the puerperium.\textsuperscript{64} Our finding is consistent with most previous studies,\textsuperscript{2,5,6} although a lack of increase in prevalence of major depressive disorder during this period has also been reported.\textsuperscript{7,8} Past negative results may have been due to differences in the diagnostic criteria, the timing of the assessments, limited sample sizes, or use of convenience samples rather than population-based samples. Our findings underscore the need for systematic screen-

<table>
<thead>
<tr>
<th>Treatment seeking for any disorder\textsuperscript{d}</th>
<th>% (SE)</th>
<th>Past-Year Pregnant Women\textsuperscript{a} (n=1524)</th>
<th>OR (95% CI)</th>
<th>AOR\textsuperscript{b} (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past 12 mo</td>
<td>16.5 (0.8)</td>
<td>10.5 (1.8)</td>
<td>0.59 (0.40-0.88)</td>
<td>0.68 (0.44-1.04)</td>
</tr>
<tr>
<td>Lifetime</td>
<td>41.0 (0.8)</td>
<td>35.8 (2.3)</td>
<td>0.80 (0.65-0.98)</td>
<td>0.88 (0.70-1.09)</td>
</tr>
<tr>
<td>Treatment seeking for alcohol use disorder</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past 12 mo</td>
<td>6.0 (0.9)</td>
<td>9.9 (4.6)</td>
<td>1.70 (0.54-5.37)</td>
<td>1.79 (0.44-7.29)</td>
</tr>
<tr>
<td>Lifetime</td>
<td>41.0 (0.8)</td>
<td>7.6 (1.6)</td>
<td>0.67 (0.43-1.05)</td>
<td>0.69 (0.43-1.13)</td>
</tr>
<tr>
<td>Treatment seeking for drug use disorder</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past 12 mo</td>
<td>17.0 (3.0)</td>
<td>30.3 (11.0)</td>
<td>2.13 (0.68-6.67)</td>
<td>2.56 (0.59-11.09)</td>
</tr>
<tr>
<td>Lifetime</td>
<td>15.3 (1.2)</td>
<td>18.0 (3.4)</td>
<td>1.22 (0.74-1.99)</td>
<td>1.18 (0.71-1.95)</td>
</tr>
<tr>
<td>Treatment seeking for mood disorder</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past 12 mo</td>
<td>25.5 (1.4)</td>
<td>14.3 (2.7)</td>
<td>0.49 (0.31-0.77)</td>
<td>0.57 (0.34-0.93)</td>
</tr>
<tr>
<td>Lifetime</td>
<td>61.1 (1.1)</td>
<td>56.1 (3.2)</td>
<td>0.76 (0.53-1.07)</td>
<td>0.86 (0.58-1.27)</td>
</tr>
<tr>
<td>Treatment seeking for anxiety disorder</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past 12 mo</td>
<td>11.6 (1.0)</td>
<td>6.1 (1.9)</td>
<td>0.50 (0.25-0.97)</td>
<td>0.62 (0.31-1.24)</td>
</tr>
<tr>
<td>Lifetime</td>
<td>29.3 (1.1)</td>
<td>23.2 (2.9)</td>
<td>0.74 (0.52-1.05)</td>
<td>0.92 (0.65-1.30)</td>
</tr>
</tbody>
</table>

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; OR, odds ratio.
\textsuperscript{a}Past-year pregnant women includes both currently pregnant and postpartum women.
\textsuperscript{b}Odds ratios adjusted for race/ethnicity, nativity, age, marital status, education, and parity.
\textsuperscript{c}Postpartum women includes women who were not currently pregnant but had been pregnant in the past 12 months.
\textsuperscript{d}Mental health service utilization among respondents with the specific 12-month or lifetime disorder (disorder occurring before the past 12 months).
amples of pregnant women.22,41,42,45,49,50,66,75 The odds of tumor periods.78 Their failure to receive psychiatric treat-

health care system during their pregnancies or postpar-
ing because most women of childbearing age access the
ously undetected health care disparity is even more strik-
creased ability to obtain care. This important, previ-
need (ie, lower prevalence) but rather may reflect a de-
differences in service use are unlikely to be due to lower

Risk factors for psychiatric disorders and substance use among pregnant women are consistent with those identified in the general population67-74 and clinical samples of pregnant women.22,41,42,45,49,50,66,75 The odds of psychiatric morbidity were greater among women who were younger (aged 18-25 years); who were widowed, separated, or divorced; who reported recent loss of a romantic relationship, trauma, or victimization; who had more stressful life events; and who had poor or fair overall health. Our study extends previous findings by documen-
ting that pregnancy complications are also associated with significantly higher risk of psychiatric morbidity in pregnant women. Identification of these groups at in-
creased risk of psychiatric disorders should help alert all clinicians who treat pregnant and postpartum women (and their children) and aid in focusing targeted prevention and early treatment interventions in these populations.

Pregnant women with psychiatric disorders seldom reported having sought mental health treatment. Consistent with previous community surveys, most women with a current psychiatric disorder did not receive any mental health care in the 12 months before the sur-

We found that this result held regardless of preg-
nancy status, even when we adjusted for sociodemo-
graphic factors. Furthermore, past-year pregnant women with past-year mood disorders had lower treatment rates than nonpregnant women. This observation is consist-
ent with a recent report that pregnant women are less likely than nonpregnant women to receive inpatient or outpatient psychiatric treatment16 and that mental health symptoms and diagnoses are significantly undetected and underrecorded in pregnant women who receive prenatal care in obstetrics clinics.46 Our analyses suggest that differences in service use are unlikely to be due to lower

need (ie, lower prevalence) but rather may reflect a de-
creased ability to obtain care. This important, previ-
ously undetected health care disparity is even more strik-

ing because most women of childbearing age access the health care system during their pregnancies or postpar-
tum periods.76 Their failure to receive psychiatric treat-
ment suggests the existence of important barriers to men-
tal health care for this population.79

Patients and health care providers may view psychi-

atric symptoms as a normative response to the physi-
ologic and psychosocial changes during this period. On

the basis of our results, such reactions may be mistaken
and may interfere with recognition and treatment of psy-
chiatric disorders among pregnant and postpartum wom-
en.21,46 Educational campaigns targeting women, their
caretakers, and primary care physicians may be needed
to increase recognition of psychiatric disorders among
pregnant women. Mental health screening during rou-
tine prenatal and obstetric care may improve the detec-
tion of psychiatric disorders.46 Dilemmas about the treat-
ment of psychiatric disorders during pregnancy and
puerperium may discourage women from seeking psy-
chiatric treatment during this period.80 Development and
testing of empirically validated treatments of pregnant
women that are safe for fetuses may increase rates of treat-
ment seeking.81,84 Competing medical demands (such as
those directly related to pregnancy, postpartum, and pe-
diatric care; other family, social, and work obligations;
or simply fatigue) may interfere with patients’ ability to
attend appointments. Treatment models that are more
patient centered may be needed to facilitate mental health
treatment of this population.85 Those models may in-
clude modifications already in place for the treatment of
other populations, such as delivery of psychotherapy over
the telephone or extended clinic hours.86

Our results should be interpreted in the context of the following limitations. First, information on pregnancy status was based on self-report and not confirmed by preg-
nancy test. Second, because the NESARC sample in-
cuded only individuals 18 years or older, information was
unavailable on adolescents, who may be at increased risk
of developing psychiatric disorders during pregnancy, al-
though rates of adolescent pregnancy have recently de-
clined.87 Third, although NESARC is the largest US psy-
chiatric epidemiologic survey ever conducted, our power
to detect subgroup differences in the prevalence of rare
mental disorders, eg, psychotic disorders, is limited. Other
recent studies8 may be better powered to examine the oc-
currence of these disorders owing to their larger sample
sizes, although they are limited by the risk of Berkson bias.
Our study, on the other hand, counterbalances this limita-
tion by its ability to examine the occurrence of disor-
ders that have not resulted in admission or treatment and
direct interview of pregnant, postpartum, and nonpreg-
nant women. Fourth, the assessment of 12-month symp-
toms in currently pregnant women may have included
women who were early in pregnancy, and therefore re-
porting symptoms largely or entirely from months prior
to pregnancy. This would reduce the apparent differ-
ences in prevalence between the nonpregnant and the preg-
nant subgroups. However, most of the findings held when
these 2 groups were analyzed separately. Fifth, the NESARC
did not specifically assess the amount of obstetric care re-
cieved by pregnant and recently postpartum women, in-
formation that would be helpful to add to future large-
scale epidemiologic studies. Sixth, the NESARC did not
collect data on month of pregnancy, time elapsed since de-

livery, use of psychotropic medication during pregnancy or
puerperium, pregnancy outcomes, or specific complica-
tions. It is possible that some of the women included in

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the postpartum group may have had a miscarriage or abortion. However, our data suggest that women with pregnancy complications have a greater prevalence of psychiatric disorders than other pregnant women. Exclusion of women with a miscarriage or abortion from the analyses would have resulted in lower estimates of mental disorders than the ones reported herein, suggesting that our analyses do not underestimate the prevalence of psychiatric disorders among pregnant women. Seventh, information on substance use and substance use disorders was based on self-report and not confirmed by objective methods. Some discrepancies have been found between self-reported and objectively measured rates of drug use in pregnant women in antenatal care. Finally, our results rely on DSM-IV Axis I categories, a dichotomous model of psychiatric disorders. Continuous models of psychiatric disorders, currently being considered for DSM-V, may have provided different results.

Despite these limitations, the NESARC constitutes the largest nationally representative survey to date to include information on psychiatric disorders in pregnant women. Pregnancy is traditionally viewed as a stressful period that may provoke mental illness. However, with the exception of major depressive disorder among postpartum women, rates of the most prevalent psychiatric disorders are not significantly higher and, in some cases, are even lower in pregnant and postpartum women than in nonpregnant women of childbearing age. It is possible that the clinical impression of elevated rates of mental disorders among pregnant women is explained by the higher contact of pregnant women with some aspects of the health care system, in this age group, compared with their nonpregnant counterparts, whose disorders are therefore underestimated. In this study, groups of pregnant women with particularly high prevalence of psychiatric disorders were identified (ie, pregnant women aged 18-25 years who were living without a partner, widowed, separated, divorced, and never married; pregnant women who experienced pregnancy complications, stressful life events, and trauma or victimization; and pregnant women with overall poor health). These more vulnerable groups should be targeted for prevention, assessment, and intervention efforts. Low rates of mental health service use were identified in this study regardless of pregnancy status. However, past-year treatment seeking for any 12-month mood disorder in past-year pregnant and postpartum women, and for any 12-month anxiety disorder in past-year pregnant women, was significantly lower than in nonpregnant women of childbearing age. Given the critical importance of this life period for mothers and their offspring, urgent action is needed to increase detection and treatment of psychiatric disorders among pregnant and postpartum women in the United States.

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Author Contributions: Dr Blanco had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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