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Positive screening rates for bipolar disorder in pregnant and postpartum women and associated risk factors

Grace A. Masters, BS[a], **Linda Brenckle, MS, RD, PMP**[a], **Padma Sankaran, MS**[a], **Sharina D. Person, PhD**[a], **Jeroan Allison, MD, MS**[a], **Tiffany A. Moore Simas, MD, MPH, MEd**[a,b], **Jean Y. Ko, PhD**[c,d], **Cheryl L. Robbins, PhD MS**[c], **Wendy Marsh, MD**[a,b], **Nancy Byatt, DO, MS, MBA**[a,b]

[a]University of Massachusetts Medical School, 55 Lake Avenue, Worcester, MA 01655

[b]UMass Memorial Health Care, Worcester, MA

[c]Centers for Disease Control and Prevention, Atlanta, GA

[d]U.S. Public Health Service Commissioned Corps, Rockville, MD

Abstract

Objective: Bipolar disorder affects 2-8% of pregnant and postpartum women; untreated illness is associated with poor outcomes. This study aimed to describe bipolar disorder screening rates in obstetric settings and associated characteristics.

Method: Women were recruited during pregnancy through three months postpartum from 14 obstetric clinics in Massachusetts. The Mood Disorder Questionnaire (MDQ) was used to screen for bipolar disorder; a subset previously diagnosed with bipolar was also examined. Differences in characteristics by screening outcome were tested using chi-square and t-tests.

Results: Of 574 participating women, 18.8% screened positive for bipolar disorder. Compared to those with negative, those with positive bipolar screens had 18.5-times the prevalence of positive substance use screens (11.1% vs. 0.6%, p<0.001) and 3.4-times reported feeling they were not receiving adequate psychiatric help (24.0 vs. 7.0%, p<0.001). Less than half of those with positive

Corresponding Author: Grace A. Masters, BS, MD/PhD Candidate, Departments of Psychiatry and Quantitative Health Sciences, University of Massachusetts Medical School, 55 N Lake Ave., Worcester, MA 01655, Phone: 1-978-793-2836, grace.masters@umassmed.edu.

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bipolar screens (42.0%) and 61.3% with pre-existing bipolar reported receiving current psychiatric care.

Conclusions: Almost one in five perinatal women screened positive for bipolar disorder. Positive screenings were associated with comorbid substance use and low treatment rates. This study highlights the importance of screening for bipolar disorder during the perinatal period and the need for systematic approaches to ensure adequate assessment and follow-up.

Keywords

Bipolar disorder; perinatal; Mood Disorder Questionnaire

1. INTRODUCTION

Bipolar disorder is a severe mental illness that affects approximately 3% of the general population[1-3] and typically requires lifelong treatment, including pharmacotherapy.[2,4-6] It is most often diagnosed between the ages of 18-30[2] years and is episodic, with exacerbations often presenting in times of stress.[7] Among women, the highest lifetime risk for first onset of bipolar disorder or mood episode recurrence occurs in the perinatal period, defined as during pregnancy or within one year postpartum.[8-10] Estimates of women with bipolar disorder that experience a mood episode during the perinatal period range from 60-70%.[11,12]

A diagnosis of bipolar disorder places both the mother and baby at increased risk of adverse outcomes, particularly when left untreated.[13] Women with untreated bipolar disorder have an increased risk of gestational hypertension and antepartum hemorrhage,[2] as well as self-injury, substance use, and suicide.[10,14,15] Infants may also be affected by a mother with untreated bipolar disorder; they are more likely to be born small for their gestational age,[2] have elevated levels of fetal stress hormones, and have impaired mother-baby bonding.[10,16] Bipolar disorder is a known risk factor for postpartum psychosis,[17] which carries a risk of suicide and infanticide.[12,14,18] Given the risks of untreated bipolar disorder, the benefits of pharmacotherapy with mood-stabilizing drugs typically outweigh the risks.[19-21] Thus, treatment initiation or continuation is recommended for most perinatal women with bipolar disorder, and discontinuation of pharmacotherapy should be discouraged.[6]

Despite associations with negative consequences, bipolar disorder in the perinatal period is underdiagnosed and undertreated.[15,22] Professional societies and expert committees recommend universal screening of pregnant and postpartum women in the obstetric setting for perinatal mood and anxiety disorders, such as perinatal depression.[19-21,23,24] The Council on Patient Safety in Women's Health Care, a multidisciplinary group of organizations that aims to improve health care for women coordinated by the American College of Obstetricians and Gynecologists (ACOG), recommends that obstetric providers should consider screening for bipolar disorder when women meet screening criteria for major depressive disorder, particularly before initiating pharmacotherapy treatment for perinatal depression.[20] Lack of bipolar disorder screening can result in women that are mistakenly thought to have depression, but actually have bipolar disorder, receiving antidepressant monotherapy.[25-27] Antidepressants are generally not recommended as monotherapy for bipolar disorder; starting an unopposed antidepressant in a woman with

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underlying bipolar disorder rather than unipolar depression can exacerbate disease by precipitating mania and psychosis.[28,29] Appropriate screening practices and subsequent assessment and connection to care as indicated may help ensure that perinatal women who screen positive for bipolar disorder receive established, evidence-based treatments.[2,4,15,30]

Despite recommendations for obstetric providers to screen for bipolar disorder in the perinatal period,[20] there is a dearth of information on the rates of positive bipolar disorder screens, associated factors, and treatment participation. These data have important implications and the potential to help inform the process of incorporating bipolar disorder screening into the work flow of busy obstetric practices.

The objectives of this study were to describe: (1) proportion of perinatal women who screen positive for bipolar disorder in the obstetric setting; (2) demographic characteristics associated with positive bipolar disorder screens among perinatal women; and, (3) the associations of positive bipolar screens with clinical characteristics and healthcare utilization.

2. METHODS

This study was conducted with a sample of English-speaking pregnant and postpartum women ages 18–45 years, recruited from May 2016 - June 2018. Women were recruited during pregnancy and up to three months after giving birth from 14 geographically diverse obstetric clinics across the Commonwealth of Massachusetts. The study was approved by University of Massachusetts Medical School Institutional Review Board. All women gave informed consent prior to participating.

Recruitment was conducted as part of a larger longitudinal study, the PRogram In Support of Moms (PRISM),[25,26] for which the methods are described elsewhere (Clinical Trials #:).[31] Women were recruited through patient lists that were compiled by participating obstetric practices and shared with the study team via secure file transfer. Study staff contacted and prescreened patients based on their demographic and clinical information, including age (18-45 years), gestational age (greater than four weeks post-conception through three months postpartum), and language (able to communicate in written and spoken English). Subsequently, a Research Coordinator telephoned prescreen-eligible patients to gain informed consent and to screen patients for full eligibility. Of contacted patients, 25.6% of patients consented to participate in the study. Of these consented participants, the response rate for the study data described herein was 87.9%.

Study data were collected via telephone interviews consisting of: (1) structured questions regarding obstetric and psychiatric care; (2) validated screening instruments for depression, bipolar disorder, and substance use; (3) demographic questions; (4) questions regarding factors associated with mental health treatment participation (e.g. "*In the past 3 months, have you seen, or talked on the telephone, to any of the following professionals about your emotions or mental health?" "In general, how satisfied are you with the way the provider handled your emotional/mental health concerns during the past 3 months?" and "Are you taking any psychiatric medications now?"*); and, (5) questions regarding unmet treatment

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needs (e.g., “During the past 3 months, was there ever a time when you felt that you needed help for your emotions, mental health but you didn't receive it?’).

Women were screened for depression using the Edinburgh Postnatal Depression Scale (EPDS),[37] a validated 10-item screening questionnaire that is widely used to assess depression during pregnancy and the postpartum period.[32] Scores range from 0 to 30; possible depression is suggested by scores ranging 9 to 13. Scores of 10 or greater were considered positive depression screens.[32] All women were screened for lifetime presence of bipolar disorder with the Mood Disorder Questionnaire (MDQ)[33] and for active substance use with the Parents, Partners, Past, and Pregnancy screen (the 4Ps).[34] Both the MDQ and 4Ps tools result in a binary positive or negative score. The MDQ is a 5-item screening questionnaire that is a widely accepted and validated tool for screening for bipolar disorder, including during pregnancy.[16,35,36] The first question screens for the *lifetime prevalence* of 13 symptoms associated with bipolar disorder (see Supplementary Table 1). Questions two and three determine the timeframe of the symptoms (they must occur together) and impairment to life, as based on the Diagnostic and Statistical Manual of Mental Disorders (DSM) 5 criteria.[37] The fourth question was to used to determine if the participant any family history of bipolar disorder and fifth question asks if the participant has ever been personally diagnosed with bipolar disorder by a health professional (Supplementary Table 1). To be included in the larger PRISM study, women must screen positive for depression on the EPDS, and negative on both the MDQ and 4Ps; however, for this study we looked at all women that prescreened as eligible, enrolled, and had complete data on the EPDS and MDQ, with a specific analytic focus on the MDQ screening results.

Several approaches have been used to score the MDQ.[35,36,38,39] The original method used the following threshold to denote a positive screen: (1) presence of seven or more symptoms in question one (Supplementary Table 1), (2) concurrent occurrence of said symptoms (question two), and (3) a resultant moderate or serious impairtment to their life (question three).[33] Revised scoring methods have been devised and tested to improve the sensitivity, while maintaining the high level of specificity.[35,40] Because of this, we opted to use a revised scoring method in this study. This method uses only the first question of the MDQ to determine screening status, meaning that women had to report a minimum of seven symptoms to result in a positive screen.[36,40] We chose this method because it achieves a sensitivity of 89% and a specificity of 84%.[35] Additionally, its Positive Predictive Value is 0.43, also greater than that of the original method.[35] Other groups have had similar success using this revised scoring method, in terms of rates of sensitivity and specificity of detecting bipolar disorder against the gold standard of the Structured Clinical Interview for DSM-IV Axis I disorders (SCID-I).[36,40]

2.1 Statistical Analyses

Participant demographic and clinical characteristics (e.g. age, race/ethnicity, insurance status, use of current psychiatric medications) and healthcare utilization patterns (e.g., offered medications or treatment, stopped medications prior to pregnancy) were calculated overall and compared between two groups based on screening result status. Chi-square and t-tests were conducted to test the differences in the distribution of each study covariate

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between groups, with alpha level for significance at 0.05. Additional sub-analyses among those women who screened positive for bipolar disorder were conducted by stratifying the group with respect to whether they had previously been diagnosed with bipolar disorder and re-examining associations. A sensitivity analysis using the original MDQ scoring method was also conducted for all relationships to see how this affected patterns in the results. All analyses were conducted using STATA, Version 14.2.

3. RESULTS

3.1 Overview

The analysis included 574 women who had complete information from the EPDS and MDQ screening tools. With few exceptions, participants also had complete information on the 4Ps screening interview and clinical, demographic, and healthcare utilization variables of interest from the interview. Demographic characteristics of the sample by MDQ screen results are outlined in Table 1. Overall, the sample had a mean age of 31.5 ± 5.3 years. More than three-quarters of the sample had at least some college education. Most women were white (71.2%) and non-Hispanic or Latina (86.0%), consistent with statewide measures.[41] Almost two-thirds of the overall sample was privately insured (65.4%). Approximately one-fifth (18.8%) of the entire sample screened positive for bipolar disorder and 22.5% screened positive for depression (EPDS).

3.2 Demographic and clinical characteristics and healthcare utilization by MDQ screening results

Women who screened positive for bipolar disorder were slightly younger than those who did not ($p<0.001$) (Table 1). Compared to women who screened negative, women who screened positive for bipolar disorder had a higher prevalence of less than or equal to a high school education ($p<0.001$) and receiving prenatal care through public health insurance, defined as MassHealth or Medicaid ($p<0.001$). No significant differences were seen across race or ethnicity in screening rates.

Clinical characteristics were significantly different by bipolar disorder screening results (Table 2). One-third of the women who screened positive for bipolar disorder (n=36) reported they had previously been diagnosed with bipolar disorder, versus only 2.6% of those that screened negative ($p<0.001$). Further, over half of those that screened positive for bipolar disorder also screened positive for depression on the EPDS (55.6%) versus only 14.8% of those that screened negative ($p<0.001$). Prevalence of screening positive for active substance use on the 4Ps questionnaire was 18.5-times higher among women with positive bipolar disorder screens (11.1%) than among those who screened negative for bipolar disorder (0.6%, $p<0.001$).

Compared to those women who screened negative, women who screened positive for bipolar disorder reported they used mental healthcare more frequently in the three months prior to interview (42.0% vs. 16.1%, $p<0.001$), had spoken with a professional about their mental health more often (54.0% vs. 22.2%, $p<0.001$), and had more commonly been offered medications/referred for mental health treatment (28.0% vs. 8.3%, $p<0.001$). The prevalence

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of self-reported unmet need for psychiatric help in the last three months was 3.4-times higher among women that screened positive for bipolar disorder than those who screened negative for bipolar disorder (24.0% vs. 7.0%, p<0.001).

Psychiatric treatment rates and medication usage patterns were also different by screening status. Less than half of the women that screened positive for bipolar disorder (42.0%) reported receiving any type of mental health care: approximately one-fifth were receiving pharmacotherapy (20.0%), one-third were receiving psychotherapy (31.0%), and one-in-eight were receiving both (13.0%) at the time of baseline interview. Almost three times as many women that screened positive for bipolar disorder had been prescribed psychiatric medications prior to pregnancy compared to those with a negative screen (34.0% vs. 12.4%, p<0.001). Amongst those women who had been prescribed psychiatric medications prior to pregnancy, no significant differences (p=0.90) were observed in the rates of medication discontinuation since learning about pregnancy by screening status.

3.3 Patterns associated with a prior diagnosis of bipolar disorder among women with a positive MDQ screen

Among women who screened positive for bipolar disorder, those who reported a pre-existing diagnosis of bipolar disorder (MDQ question 5) had similar demographic and clinical characteristics when compared with those who did not report an existing diagnosis. Greater proportions of women with a prior bipolar disorder diagnosis (n=36) reported speaking with mental health professionals, being offered medications/treatment, being in current treatment, and receiving psychiatric medications prior to pregnancy (Table 3). Women who reported a prior diagnosis did not have significantly higher proportions of current treatment with psychiatric medications compared with those who did not report a prior diagnoses (p=0.13). No other significant differences were found between those with and without a prior diagnosis in the other clinical (Table 3) or demographic covariates (data not shown) examined.

3.5 Sensitivity analyses using original MDQ scoring

Sensitivity analyses using the original MDQ scoring method yielded a positive screening rate for bipolar disorder of 8.7%, versus 18.8% using the revised method. All associations using this scoring method were consistent with those using the revised method (data not shown).

4. DISCUSSION

Women in the perinatal period are at heightened risk for new onset bipolar disorder or disease recurrence[8-10] and prior estimates suggest that three-quarters of those women will go on to have an illness which requires life-long management.[18,42,43] Given their frequent contact with healthcare providers during pregnancy, the perinatal period is a time of great potential for identifying new diagnoses or to reach at risk women who might not otherwise be identified. Obstetric providers are encouraged to universally screen for perinatal mood and anxiety disorders with validated tools, including to screen for bipolar disorder prior to

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initiating pharmacotherapy. However, what is less clear is how to connect perinatal women to mental health resources and care when indicated.

In comparison to previously published literature, positive bipolar disorder screening rates were higher in our sample of perinatal women. The few prior studies conducted in this domain have found estimates of 5-12%, depending on the MDQ scoring and recruitment methods used,[16,35,40] compared to our 18.8%. Of note, our sensitivity analysis calculations (using the original MDQ method) did yield an estimate that is more comparable to prior studies (8.7%), suggesting the importance of the MDQ scoring methods. A higher proportion of women who screened positive for bipolar disorder had lower education status and prenatal care covered by public insurance, both shown to be associated with adverse pregnancy outcomes irrespective of comorbid mental health conditions.[44,45] One of the most striking associations with screening positive for bipolar disorder in this study was the high rate of positive current substance use screens (18.5 times higher among women with bipolar disease). Though it is well known that women with bipolar disorder have high rates of comorbid substance misuse,[46-48] our findings bolster the importance of universally screening patients for active substance use during pregnancy, particularly when screened positive for other psychiatric illnesses like bipolar disorder. Universal screening for substance use disorders in pregnancy is currently recommended by ACOG, the Centers for Disease Control and Prevention, and American Medical Association.[20,49]

We found that women with positive bipolar disorder screens, compared to those with negative screens, more frequently discuss their mental health with healthcare professionals, were offered treatment or treated previously, and were in some form of psychiatric treatment at the time of the study. However, about 1 in 4 women (24.0%) with positive bipolar disorder screens reported feeling that they needed psychiatric help but were not receiving it, which was significantly higher than those that did not screen positive (7.0%). Interestingly, women with and without a pre-existing bipolar diagnosis were reported feeling that they needed more psychiatric help at very similar rates (22.6% vs. 24.6%, respectively). This is not surprising in light of the aforementioned suboptimal rates of psychiatric treatment during the perinatal period even in those with previously diagnosed bipolar disorder, and it aligns with prior research.[2,4,15,30] However, this may also be due to alternative, unexamined factors. For example, other studies have found that pregnant women are not always given a choice by their psychiatric provider as to whether they may continue medication during pregnancy[22] and, therefore, often go without any psychiatric treatment or support throughout their pregnancy.[15] These treatment patterns would be expected to lead to patient dissatisfaction and to worse outcomes.

In our study, less than half (42%) of those who screened positive for bipolar disorder were receiving any psychiatric treatment (i.e., psychiatric medication with or without psychotherapy). Because we were using screening rather than diagnostic tools, these patients may or may not be undertreated as they require further diagnostic assessment. However, we found similar patterns among the subset of those with an existing bipolar diagnosis: less than two-thirds (61%) were receiving any current treatment. More critically, only 29% of those with an existing bipolar diagnosis were receiving treatment that included psychiatric medication; low treatment rates were also reflected in those who screened positive for

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bipolar disorder (20%). Further, treatments and psychiatric medications discussed in the questionnaire were not specific to bipolar disorder and, therefore, these could well be overestimates of what psychiatric providers would consider adequate treatment for bipolar disorder.

Given the low treatment rates we observed in patients with existing bipolar disorder, the illness appears to be undertreated and/or treatment adherence is suboptimal in the perinatal period and that there is a significant gap between needed care and the actual care received for bipolar disorder. This is alarming because bipolar disorder imparts a high-risk status to a woman, her pregnancy, and her child.[16] Women may be asking for help but being stymied by long wait times to get in to see psychiatric providers or hesitancy amongst providers to treat women during the perinatal period. Our prior work indicates many barriers to psychiatric treatment during the perinatal period even when it is requested by the patients themselves, including that, in some cases, women are being instructed to discontinue their medications by mental health providers.[50] It is recommended that all perinatal women with bipolar disorder be treated with, at minimum, psychiatric mediations during the perinatal period.[4,6] Treatment of bipolar disorder in perinatal women is undoubtedly challenging due to: (1) hesitancy among medical providers to provide pharmacotherapy during pregnancy; (2) controversies and misconceptions regarding the risks and benefits of medication use in pregnancy and lactation; and, (3) stigma associated with pharmacotherapy during pregnancy.[15,22] However, given that psychiatric medications have the strongest evidence for bipolar disorder treatment, this is an important practice gap that needs to be addressed as part of comprehensive obstetric care.

A limitation of this study is that our data rely on the use of screening tools rather than diagnostic interviews; therefore, we were not able to confirm the potential cases of bipolar disorder. We conducted a sub-analysis of those women with a prior diagnosis of bipolar disorder to examine if the patterns and associations observed among MDQ positive screens held and found that, with few exceptions, those with and without a prior diagnosis were fairly similar with respect to the variables we examined. Additionally, the MDQ is a widely accepted and well validated tool to screen for bipolar disorder[16,35,36] and it is noteworthy that we used a scoring methodology with the highest validated sensitivity (89%) and specificity (84%) for diagnostic-interview confirmed bipolar disorder.[3,35,36,40] The sensitivity analyses using the original scoring method showed that, regardless of screening threshold used, the relationships between the variables in our data were robust and remained consistent, suggesting real differences between the groups. The MDQ has been associated with over-identification of bipolar disorder in some cases,[40,51] which likely also contributes to our higher rates of positive bipolar screens. Additionally, the symptomatology covered on the MDQ is known to overlap with other psychiatric illnesses, which may explain some of the high degree of correlation between the positive bipolar and substance use screens. However, when we examined these same correlations with just the subset of those with a known history of bipolar disorder, the relationships remained. Additionally, the use of screening tools rather than full diagnostic interviews allowed us to obtain data from a large sample of women with minimal time burden on the behalf of the participants and the study team.

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To our knowledge, our study is one of the only to date that examines use of the MDQ and its multiple scoring methodologies and evaluates screening rates in perinatal women in an ongoing clinical trial that includes rich demographic and clinical data. While our data rely mostly on participant self-report, which is subject to recall bias, the use of multiple interviews with participants in the ongoing parent study allows for the opportunity for follow-up and future examination. Our study sample was recruited from a diverse set of practices in Massachusetts, representative of a wide array of patient experiences among the state's perinatal population, as reflected in population level data.[41,52] However, generalizability is limited to Massachusetts, which has higher rates of insurance and better access to mental health providers than most states. Therefore, there is a need for further research in other settings and populations.

Creating streamlined approaches that help obstetric settings identify potential bipolar disorder and then connect patients to appropriate assessment and follow-up are difficult due to the already immense responsibilities of these providers and practices. However, doing so has the potential to affect the lives and mental health of women that may never otherwise get treatment. Integrating depression screening into obstetric care is feasible[53] and could be expanded to include detection of bipolar disorder symptomatology and subsequent referral for assessment and treatment as indicated. Our data presented here support the recommendations from the Consensus Bundle on Maternal Mental Health, suggesting that all perinatal women should be screened for bipolar disorder before initiating any treatment for depression. We also found high rates of positive MDQ screens, consistent with other research.[16,51] In addition, our work builds on this existing literature as we have also identified an assessment and treatment gap, suggesting that more work is needed to not only help obstetric practices screen[20] but also to respond to positive screens and connect women with further assessment and treatment when indicated.

4.1 Conclusions

Almost one in five pregnant and postpartum women screened positive for bipolar disorder. Further efforts focused on improving identification, assessment, and linkage to care for women with and at risk for bipolar disorder in the perinatal period are critical to addressing this problem. This includes evaluating and determining the best methodologies for screening for the illness as well as the most effective ways to integrate bipolar disorder care detection and management into obstetric settings.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Potential conflicts of interest:

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TMS and NB currently receive grant funding from the National Institute of Health (R41 MH113381) for a project related to perinatal depression. NB and TMS received and/or receive salary and/or funding support from Massachusetts Department of Mental Health via the Massachusetts Child Psychiatry Access Program for Moms (MCPAP for Moms). NB is the founding and current statewide Medical Director of MCPAP for Moms and TMS is the Director of Engagement for MCPAP for Moms. NB is also the Executive Director of Lifeline4Moms and TMS is the Medical Director. TMS co-directs the American College of Obstetricians and Gynecologists' Expert Work Group on Maternal Mental Health and was a member of the Council on Patient Safety in Women's Health Care's task force for creation of the maternal mental health patient safety bundle and co-author on the associated commentary. NB is a member of the American College of Obstetricians and Gynecologists' Expert Work Group on Maternal Mental Health. She has served on the Perinatal Depression Advisory Board for the Janssen Disease Interception Accelerator Program, the Physician Advisory Board for Sage Therapeutics, and is a Council Member of the Gerson Lehrman Group. She has also received speaking honoraria from and serves a consultant for Sage Therapeutics or their agents and Ovia Health. NB has also received honoraria from Medscape and Miller Medical Communications. TMS has served on ad hoc Physician Advisory Boards for Sage Therapeutics, has received speaking honoraria, and serves as a consultant on observational studies and a systematic review. TMS serves as a consultant to Ovia Health and has received compensation for reviewing a perinatal depression case for McGraw Hill. For the remaining authors no conflicts were declared.

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Table 1:

Demographics

Demographics of participants in the study, based on screening results on the MDQ.

Characteristic	All participants (n = 574)	Positive MDQ[a,b] (n = 108)	Negative MDQ[b] (n = 466)	p-value
Portion of sample, %	100.0	18.8	81.2	-
Age (mean, SD)	31.5 (5.3)	29.8 (5.5)	31.9 (5.1)	<0.001
Education,%				
Grade school/Some high school	2.8	5.9	2.2	<0.001
HS diploma/GED equivalent	15.7	28.4	12.9	
Some college or associate degree	24.2	42.2	20.2	
Bachelor's degree	24.7	14.7	26.9	
Graduate degree	32.6	8.8	37.9	
Race,%				
Black/African American	13.3	20.8	11.7	0.06
White	71.2	64.6	72.7	
Asian	7.6	4.2	8.3	
Other	1.1	2.1	0.9	
More than one race	6.8	8.3	6.5	
Ethnicity,%				
Non-Hispanic/Latina	86.0	85.3	86.2	0.81
Primary source of medical payment for prenatal care,%				
Private health insurance	65.4	37.6	71.4	<0.001
Public Health insurance (MassHealth or Medicaid)	33.4	60.4	27.5	
Some other kind of insurance	1.2	2.0	1.1	

[a]Mood Disorder Questionnaire (MDQ) was considered a positive screen if patient reported 7 or more symptoms on question 1.

[b]Total percentages may not sum to 100.0% because of rounding. Variables with missing values: education (n = 7), race (n = 32), ethnicity (n = 8), medical payment (n = 8).

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Table 2:

Clinical characteristics and healthcare utilization patterns associated with a positive bipolar disorder screen

Breakdown of treatment patterns of participants in the study, based on screening results on the MDQ.

Characteristic	All participants (n = 574)	Positive MDQ[a] (n = 108)	Negative MDQ (n = 466)	X^2	p-value
Patient diagnostics					
Prior diagnosis of bipolar disorder	8.4	33.3	2.6	108.2	<0.001
Positive active substance use screen[b]	2.6	11.1	0.6	37.7	<0.001
Positive current depression screen[c]	22.5	55.6	14.8	83.6	<0.001
Overall mental healthcare utilization					
Spoke with professional about mental health[d]	27.9	54.0	22.2	41.2	<0.001
Offered medications/referred for mental health treatment[d]	11.8	28.0	8.3	30.6	<0.001
Unmet treatment need (i.e., Felt needed psychiatric help but didn't receive it)[d]	10.0	24.0	7.0	26.4	<0.001
Psychiatric treatment type					
Any current treatment[e]	20.8	42.0	16.1	33.4	<0.001
Current treatment with psychiatric medications	9.0	20.0	6.6	18.2	<0.001
Current treatment with psychotherapy	14.5	31.0	10.9	26.7	<0.001
Current treatment with both psychiatric medications and therapy	4.5	13.0	2.6	20.7	<0.001
Psychiatric medication usage					
Prescribed medications prior to pregnancy	16.3	34.0	12.5	27.9	<0.001
Stopped since learning pregnant (n = 90)[f]	65.6	64.7	66.1	0.02	0.90

[a] Mood Disorder Questionnaire (MDQ) was considered a positive screen if patient reported 7 or more symptoms on question 1.

[b] Substance use screen done using the 4Ps questionnaire.

[c] Depression screen done using the EPDS, where a score ≥ 10 was considered positive.

[d] Time frame is the past 3 months, prior to interview.

[e] Any current treatment refers to patients currently prescribed psychiatric medications and/or psychotherapy.

[f] Question regarding stopping medications since learning pregnant was only asked of a subset of women, or those who responded yes to having been prescribed medications prior to pregnancy; therefore, the n is not that of the entire sample. Variables with missing values: prior diagnosis (n = 1), substance screen (n = 1), spoke with professional about health (n = 15), offered treatment (n = 16), felt needed help (n = 16), any current treatment (n = 16), current med treatment (n = 17), current psychotherapy (n = 17), prescribed meds prior (n = 16), stopped meds (n = 1).

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Table 3:

A sub-analysis of clinical characteristics and healthcare utilization patterns associated with the presence or absence of a prior diagnosis of bipolar disorder

Among women who screened positive for bipolar disorder on the MDQ, this is a breakdown of associations with regard to the presence or absence of a prior bipolar diagnosis. Among women who screened positive for bipolar disorder on the MDQ, no significant statistical differences were seen when comparing between those with and without a prior bipolar disorder diagnosis with regard to demographic characteristics (data not shown).

Characteristic	All Positive MDQ[a] (n = 108)	Prior diagnosis of bipolar disorder[b] (n = 36)	No prior diagnosis (n = 72)	X^2	p-value
Patient diagnostics					
Positive active substance use screen[c]	11.1	13.9	9.7	0.42	0.52
Positive current depression screen[d]	55.6	63.9	51.4	1.5	0.22
Overall mental healthcare utilization					
Spoke with professional about mental health[e]	54.0	80.7	42.0	12.8	**<0.001**
Offered medications/referred for mental health treatment[e]	28.0	45.2	20.3	6.6	**0.01**
Unmet treatment need (i.e., Felt needed psychiatric help but didn't receive it)[e]	24.0	22.6	24.6	0.05	0.82
Psychiatric treatment type					
Any current treatment[f]	42.0	61.3	33.3	6.9	**0.01**
Current treatment with psychiatric medications	20.0	29.0	15.9	2.3	0.13
Current treatment with psychotherapy	31.0	41.9	26.1	2.5	0.13
Current treatment with both psychiatric medications and therapy	13.0	12.9	13.0	0.01	0.99
Psychiatric medication usage					
Prescribed medications prior to pregnancy	34.0	51.6	26.1	6.2	**0.01**
Stopped since learning pregnant (n = 90)[g]	64.7	62.5	66.7	0.06	0.8

[a] Mood Disorder Questionnaire (MDQ) was considered a positive screen if patient reported 7 or more symptoms on question 1.

[b] Prior diagnosis as reported on question 4 on the MDQ.

[c] Substance use screen done using the 4Ps questionnaire.

[d] Depression screen done using the EPDS, where a score ≥ 10 was considered positive.

[e] Time frame is the past 3 months, prior to interview.

[f] Any current treatment refers to patients currently prescribed psychiatric medications and/or psychotherapy.

[g] Question regarding stopping medications since learning pregnant was only asked of a subset of women, or those who responded yes to having been prescribed medications prior to pregnancy therefore, the n is not that of the entire sample.