Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

General Hospital Psychiatry 79 (2022) 1–6

Contents lists available at ScienceDirect

General Hospital Psychiatry

journal homepage: www.elsevier.com/locate/genhospsych

Risk for postpartum depressive symptoms among pregnant women in a tertiary care setting with and without a positive COVID-19 test

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ARTICLE INFO

Keywords:
COVID-19
Postpartum depression
Pregnancy

ABSTRACT

Objective: This study systematically examines risk for postpartum depressive symptoms based on COVID-19 positivity status during pregnancy.
Methods: This is a retrospective matched cohort study of pregnant patients admitted to labor and delivery units from March through December 2020. Patients were administered three depression screening questions followed by the Edinburgh Postnatal Depression Scale (EPDS).
Results: 129 patients with positive COVID-19 tests (most with mild symptoms) were matched with 516 COVID-19 negative controls. We found no significant differences in rates of positive responses to screening questions (14/129, 10.9% vs. 72/516, 14.0%; $p = .35$) or EPDS scores >9 (6/97, 6.2% vs. 42/410, 10.2%; $p = .22$). Prior history of psychiatric illness was the only significant predictor of an EPDS score > 9 (adjOR 2.57, $p = .002$) or a positive brief screen for postpartum depressive symptoms (adjOR 2.93, $p < .001$).
Conclusions: No significant differences in the rates for postpartum depressive symptoms were observed among pregnant women with and without a positive COVID-19 test during pregnancy, suggesting that testing positive for COVID-19 during pregnancy was not associated with an increased risk for the development of depressive symptoms during the acute postpartum period. Overall rates of postpartum depression symptoms were low, perhaps owing to the higher socioeconomic status of the sample.

1. Introduction

Accumulating evidence suggests a negative impact of the COVID-19 pandemic on the psychological and socioeconomic well-being of the population at large, but also on pregnant and postpartum women [1–3]. Evidence demonstrates that the virus can also cause adverse maternal and neonatal outcomes, including preeclampsia, thromboembolic disease, preterm birth, NICU admission, stillbirth and perinatal mortality [4–6], as well as a range of serious adverse neuropsychiatric sequelae, including an increased risk for depression and anxiety [7]. The mechanism underlying these negative consequences of viral infection may be related to excessive production of proinflammatory cytokines, also known as "cytokine storm" [8]. In addition, adverse psychological factors stemming from the COVID-19 pandemic, including social isolation, reduced social support, and other adverse socioeconomic factors, have caused high levels of psychological distress, especially among pregnant and postpartum women [2,6,9]. Among the most vulnerable to such stressors appear to be pregnant women with a previous psychiatric history [10,11].

The relationship between COVID-19 infection during pregnancy and the development of postpartum depression remains poorly understood. A meta-analysis of studies conducted during the pandemic found higher prevalence rates of postpartum depression ranging from 12% to 44%, a nearly two-fold increase in the risk for postpartum depression during

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https://doi.org/10.1016/j.genhosppsych.2022.08.006
Received 22 June 2022; Received in revised form 27 August 2022; Accepted 30 August 2022
Available online 6 September 2022

pre-pandemic times (13–19%) [12]. Others have noted increased [13] and decreased [14] odds of postpartum depression among women pregnant during the COVID-19 pandemic compared to pre-pandemic times.

However, only a few studies have directly examined the risk for postpartum depression and its association with a positive or negative COVID-19 test during pregnancy. One study from a COVID-19 maternity ward in India found that of 187 COVID-19 positive mothers who presented for 6-week follow-up, 70% scored in the mild range (i.e. 5–9) for depressive symptoms on the Patient Health Questionnaire-9 (PHQ-9) and 14% scored in the moderate range (i.e. 10–14) [15]. However, a comparison group of patients negative for COVID-19 was not included. Another study from a hospital in the United States compared scores on the Patient Health Questionnaire-2 (PHQ-2) between asymptomatic women with positive and negative tests for COVID-19 at the time of delivery. At two weeks postpartum, none of the 8 women with positive tests and 6% (13/213) of the women with negative tests reported experiencing depressive symptoms at least half of the days in the past 2 weeks [16]. A third study, involving a case- control design, found that mean scores on the Edinburgh Postnatal Depression Scale (EPDS) were higher among COVID-positive women compared to COVID-negative women (26.64 vs. 24.76, $p < .001$) [17]. However, the acuity of psychiatric illness in both groups, based on high EPDS scores, limits the generalizability of these results.

To address the gap in knowledge regarding the risk for postpartum depression following COVID positivity status in pregnancy, the present retrospective cohort study systematically investigates the risk for postpartum depressive symptoms, using validated depression screening instruments, among women with and without a positive test for COVID-19 during pregnancy.

2. Methods

We conducted a matched, retrospective cohort study of pregnant patients admitted to labor and delivery units within the Cleveland Clinic, a large tertiary-care hospital system, from March through December 2020. A hospital policy of universal testing for COVID-19 prior to delivery was followed. Patients with a planned delivery were tested 3 days prior to admission with a Center for Disease Control-approved real-time polymerase chain reaction (PCR) platform, whereas patients who presented in spontaneous labor or who declined preadmission testing were tested using a rapid platform [18]. In addition, some patients may have also been tested earlier in pregnancy due to either symptoms or exposure. Patients with a positive COVID rapid or PCR test result at any point in pregnancy were included as subjects. Subjects were matched in a 1:4 ratio for age, race, marital status, and zip code to patients with no positive test for COVID at any point during pregnancy. As part of standard clinical care at this institution, all patients are routinely screened for postpartum depression at 2 and 6 weeks following delivery with modified versions of the first two questions of the Primary Care Evaluation of Mental Disorders (PRIME-MD) and an additional question about suicidal ideation. The modified PRIME-MD questions are as follows: Over the past 2 weeks, have you felt down, depressed or hopeless?; Over the past 2 weeks, have you felt little interest or pleasure in doing things? In addition, one question about self-harm is: Have you had thoughts of harming yourself or others? A response of 'yes' to any of these 3 questions was considered a *positive brief screen* for postpartum depressive symptoms. Patients who screen positive are then administered the full Edinburgh Postnatal Depression Scale (EPDS). For this analysis, the primary outcome was an EPDS score of 9 or above, considered a *positive response* for postpartum depressive symptoms. The *positive brief screen* rate was analyzed as a secondary outcome.

Brief screening results, EPDS scores, and other variables such as patient demographics, COVID-19 symptoms, pregnancy complications (e.g. unplanned cesarean section, operative vaginal delivery), and neonatal outcomes (e.g. low or very low birth weight) were collected through retrospective electronic medical record review. All study procedures were approved by the Cleveland Clinic Institutional Review Board.

Normally-distributed continuous measures were summarized using means and standard deviations and compared using two-sample *t*-tests. Continuous measures that show a departure from normality and ordinal measures were summarized using medians and quartiles and compared using Wilcoxon rank-sum tests. Categorical factors were summarized using frequencies and percentages and were compared using Pearson's chi-square tests or Fisher's exact tests. Multivariable mixed-effects logistic regression models adjusting for factors of clinical importance were fit predicting several mental health outcomes, matching groups were treated as random effect clusters. All analyses were done using SAS (version 9.4, The SAS Institute, Cary, NC), and a $p < .05$ was considered statistically significant. Greedy matching was perform via gmatch.sas (Erik Bergstralh & Jon Kosanke. 08/2007).

3. Results

A total of 9609 women were admitted to labor and delivery units during the study period. Among this cohort, we identified 129 patients (1.34%) with a positive test for COVID during pregnancy and 516 matched control patients without a positive test for COVID during pregnancy. Characteristics of subjects and controls are listed in Table 1. The majority of patients were Non-Hispanic White (79/129, 61.2%) or Non-Hispanic Black (36/129, 27.9%). About half of the patients were married or in a partnered relationship (63/129, 48.8%). The median household income was estimated from zip codes to be approximately $57,400. A minority of patients had a history of conditions such as hypertension (18/129, 14.0%), respiratory disease (23/129, 17.8%), diabetes (6/129, 4.7%), cardiovascular disease (4/129, 3.1%) or thromboembolic disease (2/129, 1.6%). Slightly more than a quarter of patients had a history of psychiatric illness (35/128, 27.3%), with unipolar depression (20/128, 15.6%) and anxiety (27/128, 21.1%) being the most common diagnoses. Relative to the number of patients with a history of mental illness, a smaller proportion of patients (29/129, 22.5%) were prescribed psychotropic medication prior to pregnancy. Rates of pre-existing medical conditions, psychiatric diagnoses, and psychotropic medications did not differ significantly between subjects and controls.

A sizeable proportion of patients (56/129, 43.4%) were found to be COVID-positive during universal testing on admission to labor and delivery, while a smaller proportion of patients presented to the Emergency Department or obstetric triage unit because of COVID-19 symptoms earlier in pregnancy (32/129, 24.8%). Among the COVID-19 positive patients, an affirmative COVID-19 test occurred a median of 11 days prior to delivery. About half of patients (67/129, 51.9%) were symptomatic at the time of testing, as determined by documentation of COVID-19 symptoms (e.g. fever, cough, shortness of breath) in the electronic medical record. The vast majority of patients presented with mild symptoms that did not require hospitalization. Although hospitalizations for COVID-19 were rare (7/129, 5.4%), nearly half of all hospitalized patients required admission to the intensive care unit (3/7, 42.9%).

Obstetric outcomes are displayed in Table 2. Preterm delivery (17/129, 13.2% vs. 50/516, 9.7%; $p = .25$) and low or very low birth weight (10/129, 7/8% vs. 59/516, 11.4%; $p = .23$) did not differ between subjects and controls. However, patients with a positive COVID-19 test during pregnancy were less likely to undergo operative delivery with forceps or vacuum (2/129, 1.6% vs. 84/516, 16.3%; $p < .001$).

About three-quarters of subjects (97/129, 75.2%) and controls (410/516, 79.5%) attended at least one postpartum office visit, the majority of which were within 8 weeks of delivery. Mental health outcomes are listed in Table 3. The proportion of patients with at least one EPDS score > 9 was modest for both subjects and controls (6/129, 4.7% vs. 42/516,

Table 1
Characteristics of patients with positive and negative tests for COVID-19 during pregnancy.

	Total ($N = 645$)	COVID-19 Positive ($N = 129$)	COVID-19 Negative ($N = 516$)	*p*-value
Age	28.9 ± 5.0	28.9 ± 5.2	28.9 ± 5.0	0.97[a1]
Race				
Non-Hispanic Black	180 (27.9)	36 (27.9)	144 (27.9)	
Non-Hispanic White	395 (61.2)	79 (61.2)	316 (61.2)	
Hispanic White	2 (0.31)	2 (1.6)	0 (0.00)	
Asian or Pacific Islander	3 (0.47)	3 (2.3)	0 (0.00)	
Multiracial	6 (0.93)	5 (3.9)	1 (0.19)	
Other	55 (8.5)	0 (0.00)	55 (10.7)	
Unknown	4 (0.62)	4 (3.1)	0 (0.00)	***<0.001***[d]
Combined Race				
Black	180 (27.9)	36 (27.9)	144 (27.9)	0.87[c]
White	397 (61.6)	81 (62.8)	316 (61.2)	
Other	68 (10.5)	12 (9.3)	56 (10.9)	0.80[c]
Marital Status				
Married or partnered	311 (48.2)	63 (48.8)	248 (48.1)	
Single/never married	325 (50.4)	65 (50.4)	260 (50.4)	
Other or unknown	9 (1.4)	1 (0.78)	8 (1.6)	
Median household income (American Community Survey 2019 data)	57,169.4 ± 18,430.5	57,415.0 ±18,679.3	57,108.0 ±18,385.6	0.87[a1]
Past Medical History				
Hypertension	77 (11.9)	18 (14.0)	59 (11.4)	0.43[c]
Diabetes	27 (4.2)	6 (4.7)	21 (4.1)	0.77[c]
Cardiovascular disease	21 (3.3)	4 (3.1)	17 (3.3)	0.99[d]
Respiratory disease	92 (14.3)	23 (17.8)	69 (13.4)	0.20[c]
Thromboembolic disease	8 (1.2)	2 (1.6)	6 (1.2)	0.66[d]
Past Psychiatric History*				
Unipolar depression	129 (20.0)	20 (15.6)	109 (21.1)	0.16[c]
Bipolar depression	22 (3.4)	2 (1.6)	20 (3.9)	0.28[d]
Anxiety disorder	139 (21.6)	27 (21.1)	112 (21.7)	0.88[c]
Post-traumatic stress	13 (2.0)	2 (1.6)	11 (2.1)	0.99[d]
Any of the above	213 (33.1)	35 (27.3)	178 (34.5)	0.12[c]
Psychotropic Medications (prior to pregnancy)				
Antidepressant	136 (21.1)	28 (21.7)	108 (20.9)	0.85[c]
Anxiolytic	26 (4.0)	2 (1.6)	24 (4.7)	0.11[c]
Mood stabilizer	1 (0.16)	0 (0.00)	1 (0.19)	0.99[d]
Antipsychotic	15 (2.3)	2 (1.6)	13 (2.5)	0.75[d]
Any of the above	155 (24.0)	29 (22.5)	126 (24.4)	0.64[c]

Statistics presented as Mean ± SD, N (column %).
p-values: a1 = *t*-test, b = Wilcoxon Rank Sum test, c = Pearson's chi-square test, d = Fisher's Exact test.
* Data not available for all subjects. Missing values: Unipolar depression = 1; Bipolar depression = 1; Anxiety disorder = 1; PTSD = 1; Any of the above = 1.

Table 2
Obstetric outcomes of patients with positive and negative tests for COVID-19 during pregnancy.

	Total (N = 645)	COVID-19 Positive (N = 129)	COVID-19 Negative (N = 516)	p-value
Pregnancy Complications	166			
Hypertensive disease	(25.7)	35 (27.1)	131 (25.4)	0.69[c]
Gestational diabetes	72 (11.2)	14 (10.9)	58 (11.2)	0.90[c]
Cardiovascular disease	26 (4.0)	5 (3.9)	21 (4.1)	0.92[c]
Respiratory disease	50 (7.8)	10 (7.8)	40 (7.8)	0.99[c]
Thromboembolic disease	20 (3.1)	3 (2.3)	17 (3.3)	0.78[d]
BMI in pregnancy*				
≤29	218 (35.4)	49 (38.3)	169 (34.7)	
30–34	162 (26.3)	39 (30.5)	123 (25.3)	
35–40	119 (19.3)	19 (14.8)	100 (20.5)	
>40	116 (18.9)	21 (16.4)	95 (19.5)	0.30[c]
Delivery				
Planned cesarean	101 (15.7)	17 (13.2)	84 (16.3)	0.39[c]
Unplanned cesarean*	77 (12.0)	13 (10.2)	64 (12.4)	0.48[c]
Operative vaginal	86 (13.3)	2 (1.6)	84 (16.3)	***<0.001***[c]
Gestational Age at Birth				
≥37 weeks	578 (89.6)	112 (86.8)	466 (90.3)	
34–36 weeks	47 (7.3)	14 (10.9)	33 (6.4)	
<34 weeks	20 (3.1)	3 (2.3)	17 (3.3)	0.20[c]
Birth Weight				
>2500 g	576 (89.3)	119 (92.2)	457 (88.6)	
Low birth weight < 2500 g	55 (8.5)	8 (6.2)	47 (9.1)	
Very low birth weight < 1500 g	14 (2.2)	2 (1.6)	12 (2.3)	0.48[c]

Statistics presented as N (column %).
p-values: c = Pearson's chi-square test, d = Fisher's Exact test.
* Data not available for all subjects. Missing values: BMI in pregnancy = 30; Unplanned cesarean section = 1.

8.1%; $p = .18$). Similar proportions of patients with and without positive tests for COVID-19 during pregnancy responded affirmatively to at least one screening question for postpartum depression (14/129, 10.9% vs. 72/516, 14.0%; $p = .35$). When only patients who attended at least one postpartum office visit were included, EPDS scores >9 were reported by 6.2% (6/97) of subjects and 10.2% (42/410) of controls ($p = .22$), and positive brief screening results were found in 14.4% (14/97) of subjects and 17.6% (72/410) of controls ($p = .46$). Among patients positive for COVID-19 during pregnancy, rates of EPDS scores >9 and positive brief screens for postpartum depressive symptoms did not differ significantly between patients with and without symptomatic COVID infection, presentation to the Emergency Department, or hospitalization.

In multivariable mixed-effects logistic regressions, COVID status, prior history of psychiatric illness, birth weight, unplanned cesarean section, and operative delivery were included in the models. Prior history of psychiatric illness was the only significant predictor of a positive brief screen for postpartum depressive symptoms (adjOR 2.93, $p < .001$; Supplementary Table 1) or an EPDS score > 9 (adjOR 2.57, $p = .002$; Supplementary Table 2). When patients who did not attend any postpartum visits were excluded from the model, the association with prior psychiatric illness was maintained for both a positive brief screen (adjOR 3.20, $p < .001$; Supplementary Table 3) and an EPDS score > 9 (adjOR 2.83, $p = .002$; Supplementary Table 4). Additionally, low/very low birth weight was found to be significantly predictive of a positive brief screen for postpartum depressive symptoms (adjOR 2.49, $p = .012$; Supplementary Table 3) and an EPDS score > 9 (adjOR 2.48, $p = .046$; Supplementary Table 4).

4. Discussion

To the best of our knowledge, this is one of the first and largest cohort studies to examine retrospectively the association of COVID-19 positivity during pregnancy and the risk for postpartum depressive illness using standardized depression screening tools based on the PRIME-MD and the EPDS. We found no difference in the rates of postpartum depressive symptoms among women with and without a positive COVID-19 test during pregnancy. Our findings suggest that COVID-19 positivity during pregnancy was not associated with an increased risk for postpartum depressive symptoms. Strengths of the study include the systematic inclusion of an unselected study population and the use of standardized and validated depression screening instruments.

Table 3
Mental health outcomes of patients with positive and negative tests for COVID-19 during pregnancy.

	Total	COVID-19 Positive	COVID-19 Negative	p-value
	N	N	N	
Attended ≥1 postpartum visit	645	129	516	
No	138 (21.4)	32 (24.8)	106 (20.5)	
Yes	507 (78.6)	97 (75.2)	410 (79.5)	0.29[c]
Positive brief screen[a] for postpartum depression	645	129	516	
No	559 (86.7)	115 (89.1)	444 (86.0)	
Yes	86 (13.3)	14 (10.9)	72 (14.0)	0.35[c]
Positive brief screen[a] for postpartum depression[b]	507	97	410	
No	421 (83.0)	83 (85.6)	338 (82.4)	
Yes	86 (17.0)	14 (14.4)	72 (17.6)	0.46[c]
EPDS >9	645	129	516	
No	597 (92.6)	123 (95.3)	474 (91.9)	
Yes	48 (7.4)	6 (4.7)	42 (8.1)	0.18[c]
EPDS >9[b]	507	97	410	
No	459 (90.5)	91 (93.8)	368 (89.8)	
Yes	48 (9.5)	6 (6.2)	42 (10.2)	0.22[c]

Statistics presented as N (column %).
For positive brief screen and EPDS >9, results are composite outcomes among multiple postpartum visits, assuming not attending is negative.
p-values: c = Pearson's chi-square test.
[a] 3 item screen: 2 modified PRIME-MD questions and 1 suicide question.
[b] only included patients who attended ≥1 postpartum visit.

However, our results should be taken in the context of their limitations. First, our primary outcome of postpartum depression was determined by screening procedures for depressive *symptoms* rather than a clinical diagnosis. While the EPDS is a well-validated instrument [19], it is not possible to draw a definitive diagnosis of postpartum major depression without a structured psychiatric interview. Second, the brief screening questions used as our secondary outcome have not been validated in the perinatal population, nor are they identical to the PRIME-MD questions, which have been validated as a screening measure for depression in primary care [20]. Though the first two questions of the PRIME-MD have a sensitivity of 96% (95% CI 90–99%) and a specificity of 57% (95% CI 53–62%) for the detection of major depression in the primary care setting [21], the exclusion of the specifier "often" in questions related to depressed mood and anhedonia may change the sensitivity and specificity of this tool.

Third, we found that the guidelines for the two-step screening process were not consistently followed at all postpartum visits. Approximately 20% of positive brief screens were not followed by administration of the full EPDS, leading to missing data. However, rates of missing EPDS scores did not differ between subjects and controls, minimizing bias in this case. Given the two-step screening process, we assumed that any missing EPDS scores likely suggested an absence of postpartum depressive symptoms. Such an assumption about non-response could have led to misclassification of the outcome and an underestimation of the true prevalence of postpartum depressive symptoms. Additionally, EPDS scores were reported despite negative brief screens at approximately 30% of postpartum visits attended by control patients, but at no visits attended by study subjects. The vast majority of these scores were zero and none were >9, leading to no change in the reported primary outcome.

Fourth, our findings may not be generalizable to the greater population, particularly as rates of postpartum depressive symptoms in the sample as a whole (4.7% in COVID-positive patients and 8.1% in COVID-negative patients) were considerably less than rates of postpartum depressive episodes reported prior to [22] and during [13] [14] the COVID-19 pandemic. Our results may have been influenced by the socioeconomic composition of the sample, which consisted largely of non-Hispanic, White women with a median household income close to the national average, and nearly half of the patients were married or in a partnered relationship. Studies suggest that socioeconomic factors such as race, income, and partnership status among perinatal women are associated with both perceived stress [23] and the likelihood of postpartum depression [14] during the COVID-19 pandemic. It is possible that the patients in our sample experienced greater than average social support and access to socioeconomic resources during the pandemic, reducing their risk for postpartum depressive symptoms. It is also important to note that close to 25% of subjects and controls did not attend any postpartum visits and were lost to follow-up. Previous research has found that factors associated with risk for non-attendance at postpartum visits, including low income, being separated/divorced or never married, and age < 20 years [24] [25], overlap with risk factors for postpartum depressive symptoms. Studies have also found that during the pandemic, fear of COVID-19 was associated with avoidance of routine postpartum examinations and risk for depressive symptoms [26]. In our study, it is possible that patients lost to follow-up represent a unique subgroup at risk for postpartum depressive symptoms than those who attended follow-up visits, particularly as this subgroup had a lower annual household income and included a greater proportion of patients who were single/never married and of minority race than the sample as a whole (Supplementary Table 5). Systematic examination of this subgroup deserves further study.

Additionally, the use of RT-PCR testing in some patients and point-of-care testing in others may have led to misclassification of patients as COVID-positive or negative, owing to differences in sensitivity, specificity and reliability of testing platforms. Although the rapid test used at our institution (Xpert Xpress SARS-CoV-2) has been reported to perform equally to RT-PCR, issues such as variations in specimen handling or contamination issues may still have led to false positive or false negative results. As we did not collect information on the type of test used for each patient, selection bias due to the type of test used cannot be ruled out; it is possible that patients who tested COVID-positive may have been more likely to receive one type of test and patients who tested COVID-negative another, particularly given that COVID-positive patients may have been more likely to seek testing due to symptoms of COVID-19 prior to admission to labor & delivery.

Finally, we also observed that the majority of patients in this cohort appeared to have only mild COVID-19 illnesses; most did not require hospitalization, and nearly half of the patients were asymptomatic. COVID-19 infection has a heterogeneous disease course; it may be asymptomatic or cause only mild symptoms in the majority of the cases [8]. However, in more severe cases, immunologic complications such as macrophage activation syndrome, resulting in "cytokine storm" syndrome and acute respiratory distress syndrome, may also occur in some patients [8]. Severe COVID-19 infections may also play a role in the development of neuropsychiatric sequelae, including major depressive disorder, through such a "cytokine storm" [27]. Although we did not find a significant difference in rates of postpartum depression between patients who were and were not hospitalized with COVID-19 during pregnancy, the very small number of hospitalized patients ($N = 7$) limits our ability to comment on the impact of severe COVID-19 illness in pregnancy. Additionally, the lack of significant differences in birth outcomes between COVID-positive and negative patients in our sample

may also be related to the overall mild course of illness. Our results therefore cannot be generalized to patients with moderate or severe symptoms of COVID-19, who may be at greater risk for postpartum depression.

Despite these limitations, these data from a large and well-characterized cohort add to the scant literature on the association between COVID-19 positivity during pregnancy and risk for postpartum depressive symptoms. Future research should include populations with more diverse representations of social determinants of health, and further investigation into the neurobiology of illness severity of COVID-19 infection and its association with postpartum depressive disorders.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Disclosure

Dr. Viguera receives research support from Alkermes Biopharmaceuticals; Janssen Pharmaceutica; Otsuka Pharmaceuticals; Teva Pharmaceuticals; Sage Therapeutics, Inc.; Sunovion Pharmaceuticals, Inc.; Supernus Pharmaceuticals and provides advisory/consulting services for Up-to-Date. The other authors report no proprietary or commercial interest in any product mentioned or concept discussed in this article.

CRediT authorship contribution statement

Katherine E. Taljan: Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing, Project administration. **Ashley Cantu-Weinstein:** Investigation, Writing – original draft, Writing – review & editing. **Madeline McKenna:** Investigation. **Larissa De Souza:** Investigation. **Yao Meng:** Methodology, Formal analysis, Data curation, Writing – original draft, Writing – review & editing. **Lilian Gonsalves:** Conceptualization, Supervision. **Oluwatosin Goje:** Conceptualization, Methodology, Writing – review & editing, Supervision. **Adele C. Viguera:** Writing – review & editing, Supervision.

Data availability

Data will be made available on request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.genhosppsych.2022.08.006.

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