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### Authors

Pluym, Ilina D  
Holliman, Kerry  
Afshar, Yalda  
[et al.](#)

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# Emergency department use among postpartum women with mental health disorders



Iliana D. Pluym, MD; Kerry Holliman, MD; Yalda Afshar, MD, PhD; Connie C. Lee, MHA; Misty C. Richards, MD, MS; Christina S. Han, MD; Deborah Krakow, MD; Rashmi Rao, MD

**BACKGROUND:** Mental health disorders are becoming more recognized in pregnancy. Whether mental health disorders are associated with health services utilization after child birth is not completely understood.

**OBJECTIVE:** This study aimed to investigate postpartum emergency department use within 30 days of delivery among women with preexisting mental health disorders during pregnancy.

**STUDY DESIGN:** This was a retrospective cohort study evaluating emergency department use among postpartum women with or without mental health disorders who delivered at an academic center between January 2014 and June 2018. Demographic and outcome data were medical record abstracted and analyzed. Multivariate regression was performed to adjust for covariates.

**RESULTS:** During the study period, 13,605 women delivered at the institution, 2355 of whom (17.3%) had an underlying mental health disorder. The primary diagnoses of mental health disorder were anxiety (48.8%), depression (34.8%), substance use disorder (11.4%), bipolar disorder (3.4%), psychosis (0.7%), and other (0.8%). There were a total of 565 emergency department visits within 30 days of delivery. Women who presented to the emergency department after delivery were more likely to have public insurance, identify as black or Asian, and have an underlying mental health disorder. Among women with mental health disorders, 155

(6.6%) used the emergency department within 30 days of their delivery compared with 410 (3.6%) of patients without mental health disorder (adjusted odds ratio, 1.74; 95% confidence interval, 1.42–2.13;  $P < .001$ ). When assessing the risk of emergency department usage per the type of mental health disorder, anxiety (adjusted odds ratio, 1.73; 95% confidence interval, 1.31–2.27) and depression (adjusted odds ratio, 2.13; 95% confidence interval, 1.59–2.86) carried the highest risk. Compared with women without mental health disorders, women with underlying mental health disorders had more presentations for hypertension (15.5% vs 11.2%) and psychiatric evaluations (4.5% vs 0.2%; both  $P < .001$ ).

**CONCLUSION:** Women with mental health disorders use the emergency department during the postpartum period for psychiatric and obstetrical reasons more frequently than women without mental health disorders. Increased surveillance, treatment, and follow-up during pregnancy and the early postpartum period may be warranted for this high-risk population.

**Key words:** anxiety, depression, emergency department, fourth trimester, maternal, mood disorders, obstetrical, perinatal, pregnancy, psychiatric

## Introduction

Approximately 1 in 20 women will use the emergency department (ED) within the first 6 weeks after delivery for unscheduled medical care.<sup>1</sup> This prevalence rises to 1 in 12 women within the first 90 days after delivery.<sup>2</sup> The predictors of ED usage after delivery include public insurance, age younger than 20 years, severe maternal morbidity at delivery, and cesarean delivery.<sup>2</sup> Previous studies have evaluated a published definition of antepartum complications,<sup>2</sup> which incorporates mental health disorders (MHDs) as an additional risk factor. However, to date, there is limited evidence whether MHDs specifically are an

additional risk factor for postpartum ED use for any indication.

Preexisting MHDs affect up to 15% of pregnant women in the United States<sup>3,4</sup> and have been demonstrated to contribute substantially to preterm delivery and lower rates of breastfeeding initiation.<sup>5</sup> Hospital administrative data have shown an overall increase of postpartum depression by 34% in the past years, especially among women with public insurance and a complicated antepartum course.<sup>6</sup> The postpartum period has also been identified as the time of the highest risk for many women in terms of morbidity and mortality. Recent efforts by the American College of Obstetricians and Gynecologists (ACOG) have increased the awareness of the postpartum period or “fourth trimester” of pregnancy<sup>7</sup> during which time more than 60% of maternal mortality occurs.<sup>8</sup> Furthermore, up to 30% of maternal mortality is due to self-harm,<sup>9</sup> most commonly among women with preexisting MHDs. In addition, an

ED visit within 30 days of discharge is a frequently used quality metric<sup>10</sup> and a focus of this study. Our objective was to investigate whether women with preexisting MHDs have higher all-cause usage of the ED within 30 days of delivery than women without preexisting MHDs.

## Methods

This was an institutional review board–approved (number 18-000584) retrospective cohort of women who delivered at an academic quaternary care center from January 2014 to June 2018. We used a hospital database designed for quality improvement to identify all discharges after a delivery greater than 20 weeks’ gestation and to evaluate ED encounters within 30 days of delivery. All women presenting to our institution in the postpartum period were initially evaluated in the main ED and included in this study. If women had multiple deliveries during this period, only the first delivery was included. Available patient demographics, psychiatric

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## AJOG MFM at a Glance

**Why was this study conducted?**

This study aimed to evaluate postpartum emergency department (ED) usage among women with mental health disorders.

**Key findings**

Women with preexisting mental health disorders use the ED during the postpartum period almost twice as frequently as women without mental health disorders.

**What does this add to what is known?**

Women with underlying mental health disorders are associated with a higher likelihood of using the ED after child birth for psychiatric and obstetrical causes.

comorbidities, delivery data, and ED visit diagnoses were collected. We then identified women who had a diagnostic code for a preexisting MHD during the pregnancy and categorized them into the following: depression, anxiety, bipolar disorder, substance use disorder, psychosis, and other (the sum of personality and eating disorders) (Supplemental Table). If women had multiple MHDs, they were categorized by their primary diagnosis. The primary outcome was an ED encounter within 30 days of delivery,

in accordance with the ACOG's initiative to prioritize this period. Only the first ED encounter was analyzed whether women had multiple visits during the 30 days after delivery. Secondary outcomes included obstetrical outcomes, such as method and gestational age at time of delivery. Data collected included age, race, parity, marital status, insurance payer, body mass index, length of delivery encounter, delivery data, and indications for the ED encounter. Data were analyzed using the Student's *t* test,

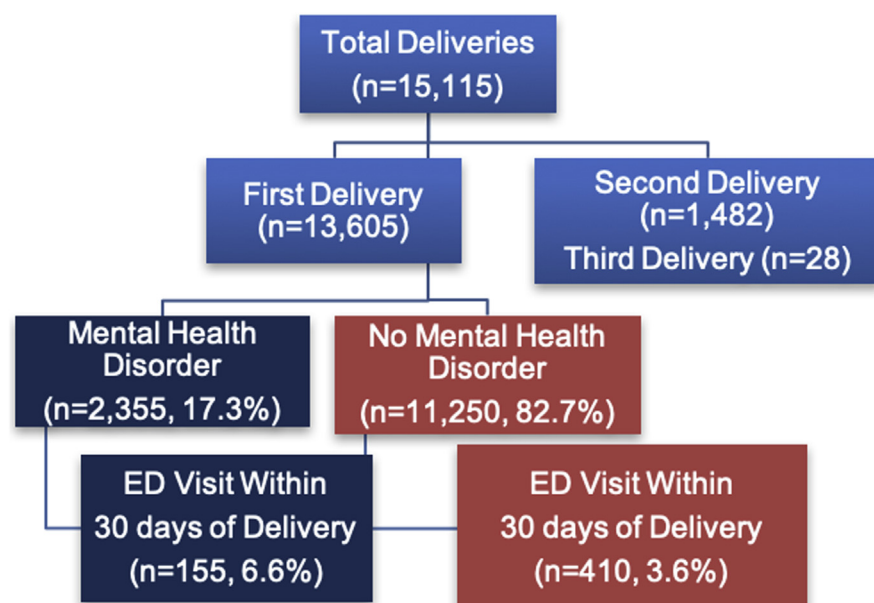
Wilcoxon rank-sum test, Fisher exact test, and chi-square test as appropriate. We ran a logistic regression to adjust for covariates using a backward elimination method. All covariates with anticipated association based on literature review or those with observed differences in univariate analysis were initially included. Variables with a *P* value of  $>.2$  in univariate analysis were eliminated. Crude and adjusted odds ratios (ORs) were reported with their 95% confidence intervals (CIs). Data were analyzed using the Stata software (version 15.1; StataCorp LLC, College Station, TX).

**Results**

There were 15,115 births between January 2014 and June 2018 to 13,605 women. Only the first delivery for each patient during this period was included in the analysis and second ( $n=1,482$ ) and third ( $n=28$ ) deliveries were excluded (Figure 1). Among all women, 2,355 (17.3%) had underlying MHDs. The following are the primary diagnoses listed for those women with MHDs: 48.8% for anxiety ( $n=1,151$ ), 34.8% for depression ( $n=819$ ), 11.4% for substance use disorder ( $n=269$ ), 3.4% for bipolar disorder ( $n=81$ ), 0.7% for psychosis ( $n=17$ ), and 0.8% for other ( $n=18$ ). Women with MHDs were more likely to identify as non-Hispanic white (white), non-Hispanic black (black), single, with public insurance, and with a longer hospital length of stay (Table 1).

There were a total of 565 (4.2%) ED visits within 30 days of delivery among women that delivered during this period. Women who used the ED after delivery were more likely to have an MHD, identify as black or Asian, have public insurance, carry a nulliparous, term, singleton, vertex pregnancy and have had a cesarean delivery (Table 2). Among women with MHDs, 155 of 2,355 (6.6%) used the ED within 30 days of delivery compared with 410 of 11,250 patients (3.6%) without MHDs ( $P<.001$ ). Multivariable logistic regression demonstrated that women with MHDs had greater usage of the ED after adjusting for covariates (adjusted OR [aOR], 1.74; 95% CI, 1.42–2.13) (Table 2). When assessing the risk of ED

**FIGURE 1**  
Participant flowchart



ED, emergency department.

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TABLE 1

## Demographics and obstetrical outcomes of pregnant patients with and without mental health disorders (N=13,605)

Variables	Patients with mental health disorders (N=2355)	Patients without mental health disorders (N=11,250)	P value
ED visit within 30 d of delivery	155 (6.6)	410 (3.6)	<.001 <sup>a</sup>
Age, y	33.3±5.3	33.2±5.3	.013 <sup>b</sup>
Race			<.001 <sup>a</sup>
Asian	271 (11.5)	2154 (19.2)	
Black	170 (7.2)	577 (5.1)	
Latinx	535 (22.7)	2595 (23.1)	
Other	227 (9.6)	1302 (11.6)	
White	1152 (48.9)	4622 (41.1)	
	N=2214	N=9890	
Public insurance	319 (14.4)	1212 (12.3)	.006 <sup>a</sup>
Marital status			<.001 <sup>a</sup>
Single	659 (28.0)	2418 (21.5)	
Married or other	1696 (72.0)	8832 (78.5)	
	N=2059	N=9645	
BMI, kg/m <sup>2</sup>	30.0±5.7	29.1±5.0	<.001 <sup>b</sup>
NTSV	1108 (47.1)	5199 (46.2)	.460 <sup>a</sup>
Cesarean delivery	893 (37.9)	3481 (30.9)	<.001 <sup>a</sup>
Length of stay for delivery encounter (d)	3.0 (2.4–4.1) <sup>c</sup>	2.7 (2.2–3.6) <sup>c</sup>	<.001 <sup>d</sup>
Preterm delivery	365 (15.5)	1171 (10.4)	<.001 <sup>a</sup>

Data are presented as number (percentage) or mean±standard deviation unless otherwise specified.

BMI, body mass index; ED, emergency department; NTSV, nulliparous, term, singleton, vertex.

<sup>a</sup> Chi-square test; <sup>b</sup> Student *t* test; <sup>c</sup> Median (interquartile range, 25%–75%); <sup>d</sup> Wilcoxon rank-sum test.

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usage per the type of MHD, anxiety (aOR, 1.73; 95% CI, 1.31–2.27) and depression (aOR, 2.13; 95% CI, 1.59–2.86) carried the highest risk (Table 3).

The most common indications for ED use were hypertension, pain control, and evaluation of an obstetrical wound (Figure 2). Compared with women without MHDs, women with underlying MHDs had more presentations for hypertension (15.5% vs 11.2%) and psychiatric evaluations (4.5% vs 0.2%). Women with MHDs were less likely to present to the ED for complaints of an obstetrical wound (14.8% vs 21.0%), breast issue (3.2% vs 9.3%), or gastrointestinal issue (0.6% vs 3.9%). The median postpartum day of presentation to the ED did not differ among women

with MHDs (mean, 7.4; interquartile range [IQR], 5.1–12.8) compared with those without MHDs (mean, 8.2; IQR, 5.1–13.6; *P*=.584) (Figure 3).

## Comment

### Principal findings

In this study, we set out to determine whether the presence of underlying MHDs affected postpartum use of the ED. Our data indicate that mental health is a considerable risk factor for postpartum ED use by almost 2-fold in women with MHDs compared with those without MHDs.

## Results

Women with MHDs use the ED for psychiatric complaints and other obstetrical complications, including

hypertension, mostly within the first 2 weeks after delivery. This finding was in the context that all patients with hypertensive disorders at our institution were scheduled for outpatient blood pressure checks around 1 week after delivery. Our data support existing literature that identifies preexisting MHDs as a risk factor for postpartum psychiatric illness.<sup>11,12</sup> However, there are limited studies evaluating MHDs and the risk of all-cause postpartum use of the ED. A case-control study by Sheen et al<sup>13</sup> did not demonstrate previous psychiatric history as a risk factor for postpartum ED usage, although their cohort is notable for a lower rate of psychiatric illness (12%) self-reported or coded in the medical record, possibly limiting the generalizability of their results. Among

**TABLE 2**  
**Adjusted ORs of ED visit within 30 days of delivery (N = 13,605)**

Variables	Use of ED (n=565) N=508	No use of ED (n=13,040) N=11,596	Crude OR(95% CI)	Adjusted OR (95% CI) <sup>a</sup>
Public insurance	111 (21.9)	1420 (12.3)	2.00 (1.61–2.49)	1.99 (1.56–2.54) <sup>b</sup>
Race and ethnicity				
Asian	106 (18.8)	2319 (17.8)	1.34 (1.04–1.70)	1.43 (1.11–1.83) <sup>b</sup>
Black	55 (9.7)	692 (5.3)	2.32 (1.70–3.17)	1.90 (1.35–2.68) <sup>b</sup>
Latinx	153 (27.1)	2977 (22.8)	1.50 (1.21–1.87)	1.24 (0.97–1.60)
Other	60 (10.6)	1469 (11.3)	1.19 (0.88–1.60)	1.10 (0.81–1.52)
White	191 (33.8)	5583 (42.8)	Reference	Reference
Mental health disorder	155 (27.4)	2200 (16.9)	1.86 (1.54–2.25)	1.74 (1.42–2.13) <sup>b</sup>
Cesarean delivery	244 (41.2)	4130 (31.7)	1.64 (1.38–1.94)	1.70 (1.41–2.03) <sup>b</sup>
NTSV	291 (51.5)	6016 (46.1)	1.24 (1.05–1.47)	1.47 (1.21–1.76) <sup>b</sup>

Data are presented as number (percentage) or mean±standard deviation unless otherwise specified.

CI, confidence interval; ED, emergency department; NTSV, nulliparous, term, singleton, vertex; OR, odds ratio.

<sup>a</sup> Adjusted for covariates; <sup>b</sup> Statistically significant.

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an exclusive publicly insured population, bipolar disorder has been found to increase the odds of postpartum ED use and hospital admission, but the findings did not hold true to depression or other mental health conditions.<sup>14</sup> In our cohort, patients with public health insurance and depression or anxiety were more likely to seek out care in the ED, and the associations held true after adjusting for each other.

### Clinical implications

Guidance varies as to the optimal timing of postpartum visits, particularly in

women with MHDs. The ACOG suggests that the initial assessment occurs within the first 3 weeks of birth, followed by a comprehensive well-woman visit no later than 12 weeks after delivery,<sup>7</sup> a recommendation that most patients find desirable.<sup>15</sup> Furthermore, they suggest that additional or earlier postpartum visits are recommended for women who experience complications during pregnancy, including MHDs. In our institution, we subscribe to the common practice of scheduling a follow-up mood check at 1 to 2 weeks after delivery for patients with unstable MHDs. The

findings suggest that early follow-up may be indicated in all patients with MHDs, regardless of the degree of the MHD.

The ED is often the first point of contact for mental health concerns in up to 60% of women with MHDs.<sup>16</sup> Although their chief complaint may not specifically be a psychiatric issue, it is not uncommon for women to seek the ED for somatic complaints, which may be masking their underlying mental health concerns.<sup>17</sup> This remains true for antepartum ED use as well, as population data have demonstrated that ED presentations during pregnancy are

**TABLE 3**  
**Adjusted ORs of ED visit by type of mental health disorder**

Variables	ED visit (N=565)	No ED visit (N=13,040)	Crude OR	Adjusted OR (95% CI) <sup>a</sup>
No mental health disorder	410 (72.5)	10,840 (83.1)	Reference	Reference
Anxiety	67 (11.9)	1084 (8.3)	1.63 (1.25–2.13)	1.73 (1.31–2.27) <sup>b</sup>
Depression	60 (10.6)	759 (5.8)	2.09 (1.58–2.77)	2.13 (1.59–2.86) <sup>b</sup>
Other	28 (5.0)	357 (2.7)	2.07 (1.39–3.08)	1.46 (0.93–2.28)

Data are presented as number (percentage) or mean±standard deviation unless otherwise specified.

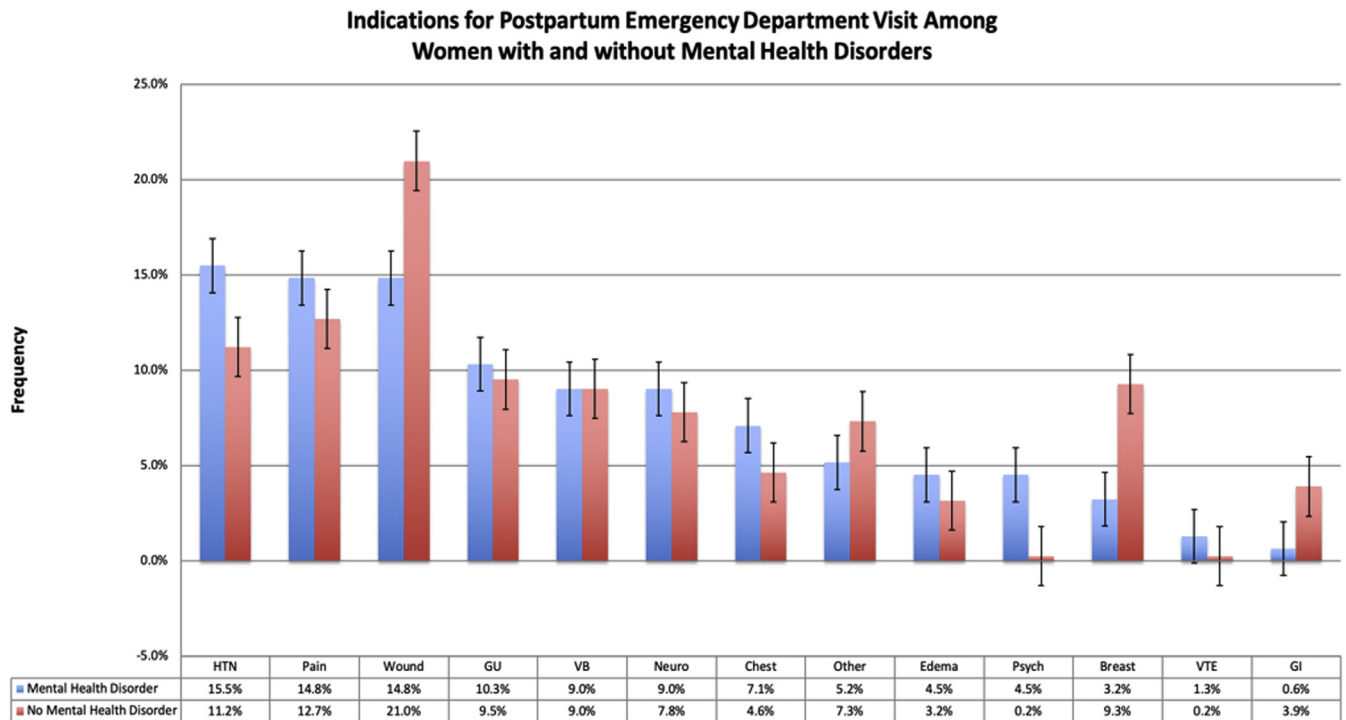
Other indicates substance use, bipolar, psychosis and other disorders.

ED, emergency department; OR, odds ratio.

<sup>a</sup> Adjusted for race and public insurance; <sup>b</sup> Statistically significant.

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**FIGURE 2**  
**Indications for postpartum emergency department visits**



Error bars indicate standard error.

*Chest*, cardiorespiratory; *GI*, gastrointestinal; *GU*, genitourinary; *HTN*, hypertension; *Neuro*, neurologic; *Psych*, psychiatric; *VB*, vaginal bleeding; *VTE*, venous thromboembolism.

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associated with hospitalizations for postpartum depression.<sup>18</sup> For this reason, we believe that all pregnant and postpartum women who present to the ED warrant a thorough investigation into her signs and symptoms and a screen for depression. Routine screening for depression has been implemented in mothers presenting their infants to a pediatric ED with up to 25% screen-positive rates, highlighting the enormity of the disease.<sup>19,20</sup> Feasibility of routine depression screening in all adults at a regular ED has been done and similarly demonstrates a 20% screen-positive rate.<sup>21</sup>

### Strengths and limitations

These results highlight an understudied and high-risk population, but the authors acknowledge that further prospective studies are required to determine what interventions are necessary to reduce morbidity and

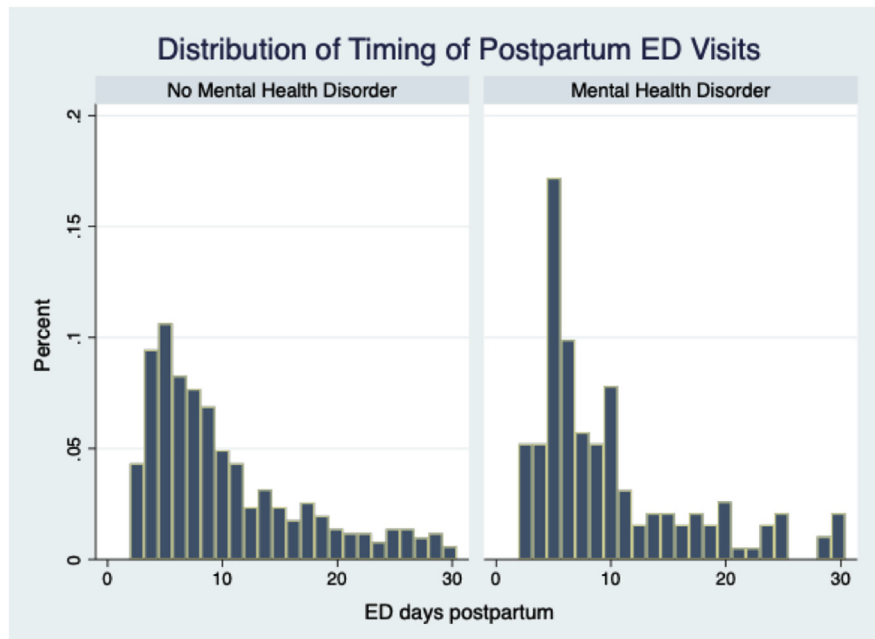
healthcare cost. First, we were limited in our ability to identify the use of non-ED medical resources. There is likely a selection bias of women presenting to the ED toward those that are unable to obtain an outpatient visit secondary to limited access, insurance, or a therapeutic alliance with a provider, all of which can coexist with MHDs. It is difficult to predict whether shortening the time interval to or increasing the frequency of outpatient appointments would decrease ED usage. Secondary to coding limitations, we were unable to identify the risks of concurrent psychiatric illness and substance use disorder on pregnancy, a known risk factor to all-cause mortality in the general population.<sup>22,23</sup> Importantly, we were also unable to identify antenatal medical comorbidities, including hypertension or diabetes or postpartum complications in the mother or neonate that could exacerbate underlying MHDs. Finally,

like any analysis relying on administrative data, we are limited to the accuracy of the coding. Some strengths include the generalizability of these data to other institutions, most importantly determined by the comparable rates of perinatal depression in California (13.0%) vs the national average (12.5%).<sup>24</sup> However, in light of the racial associations we encountered with ED usage, it is important to note the higher and lower proportion of Asian and black patients, respectively, in California compared with that of other regions of the United States.<sup>25</sup>

### Conclusions

This study included an evaluation of the risks of MHDs on postpartum use of the ED. We identified that a preexisting MHD is associated with postpartum ED use within 30 days of delivery for several issues, including hypertension and psychiatric complaints. Among postpartum

**FIGURE 3**  
Distribution of timing of postpartum ED visits



ED, emergency department.

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women presenting to the ED, we encourage a thorough evaluation of signs and symptoms and consideration of screening for depression. Capturing this high-risk cohort in the ED can facilitate the connection with mental health resources and optimize long-term mental health. Finally, although the ED is an appropriate venue for certain complaints, we believe that it may represent an inefficient use of resource allocation that could be better handled in the clinical setting. Identifying this high-risk population provides insight into those who require earlier routine outpatient follow-up in an attempt to improve care and decrease visits that may fuel increasing healthcare cost. Future studies include identifying the optimal timing and venue for such follow-up, as the role of telehealth has dramatically increased, especially in patients with preexisting MHDs.<sup>26</sup> ■

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### Author and article information

From the Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, University of California, Los Angeles, Los Angeles, CA (Drs Pluym, Holliman, Afshar, Han, Krakow, and Rao); Office of

Population Health and Accountable Care, Faculty Practice Group, University of California, Los Angeles, Los Angeles, CA (Ms Lee); and Department of Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, Los Angeles, CA (Dr Richards).

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Corresponding author: Ilina D. Pluym, MD. [ipluym@mednet.ucla.edu](mailto:ipluym@mednet.ucla.edu)

## SUPPLEMENTAL TABLE

## ICD-9 and ICD-10 diagnosis and procedure codes included in the psychiatric and substance use disorder composites

Mental health condition	ICD-9	ICD-10
Anxiety	293.84, 300.0–300.89, 306.4, 306.8, 307.2, 307.59, 307.81, 308.0, 308.3, 308.9, 309.24, 309.28, 309.4, 309.81–309.90, V61.9, V62.89	F06.4, F40.01, F40.10, F40.231, F40.240, F40.243, F40.248, F40.298, F40.8, F40.9, F41.0, F41.1, F41.9, F42.0, F42.2, F42.9, F43.0, F43.1, F43.22, F43.29, F43.8, F43.9, F44.5, F44.9, F45.21, F45.22, F45.41, F45.8, F68.1, F95.0, R46.89
Depression	296.2–296.99, 300.4, 309, 309.1, 301.12, 309.24, 309.28, 309.29, 309.4, 311	F32.0–F32.9, F33, F33.1, F33.2, F33.4, F33.41, F33.42, F33.9, F34.1, F41.8, F43.2, F43.21, F43.23, F43.25, F43.29, F45.89
Substance use	291.9, 292, 292.85, 292.9, 303.03, 303.9, 303.93, 304.0–304.9, 305, 305.01–305.03, 305.1–305.93	F10.10–F10.99, F11.1–F11.9, F12.1–F12.9, F13.1, F13.282, F14.1–F14.9, F15.2–F15.9, F17.2–F17.29, F18.1, F19.1–F19.9, F55.8
Bipolar	293.83, 296.01–296.99	F31.3–F31.9, F34.81, F39
Psychosis	295.7, 295.9, 297, 297.1, 297.9, 298.9	F20.9, F22, F23, F25.0, F25.8, F29
Other	307.1, 307.5–307.59	F50.0–F50.9, F60.3

ICD-9, International Classification of Diseases, Ninth Revision; ICD-10, International Classification of Diseases, Tenth Revision.

Pluym et al. Emergency department use among postpartum women with mental health disorders. AJOG MFM 2021.