Trends in Postpartum Depression and Treatment Choices **Before and During the COVID-19 Pandemic**

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BACKGROUND

- + Postpartum depression a common but often underdiagnosed condition of childbirth affects 10 to 24% of mothers in the US each year.^{1,2}
- + Untreated postpartum depression can have a detrimental long-lasting impact on the health and well-being of children, mothers, and families.^{3,}
- + Little is known about whether COVID-19 pandemic-related stressors including social distancing, material hardship, and increased intimate partner violence – might have increased the prevalence of postpartum depression.
- + Furthermore, little is known about the types of treatment that women with postpartum depression receive, as well as any potential disparities in treatment prevalence by patient and provider characteristics.

+OBJECTIVES

- + To assess the prevalence of postpartum depression before (March 2018–February 2020) and during (March 2020–February 2022) the COVID-19 pandemic
- + To examine the types of treatment choices that women with postpartum depression received before and during the pandemic

- METHODOLOGY

Study design and data sources: A retrospective cohort analysis using Komodo Healthcare Map, a nationally representative, longitudinal, and de-identified claims database of over 320 million insured individuals in the US between 2018 and 2022

Study cohort:

From March 1 to October 31 of each year from 2018 to 2021, eligible female members were selected if they:

- + Had any ICD-10 diagnosis codes (e.g., Z370, Z372, Z373, Z375, Z376, Z379) or the procedure code (10E0) for live birth
- + Had continuous insurance coverage (medical and pharmacy benefits) for at least one year before the delivery date (baseline) and at least four months after the delivery date (follow-up)
- + Were aged 15–64 and lived in one of the 50 states or DC
- + Had no diagnosis for severe mental conditions, such as schizophrenia or schizotypal, delusional, or other non-mood psychotic disorders, in the baseline

The final data was organized as annual files. Each member could be included in multiple years if they met all of the inclusion criteria during that year.

Figure 1: Flowchart for study cohort Patients with any ICD-10 diagnosis or procedure code for a live birth



+ To investigate patient and provider characteristics that are associated with treatment choices among women with postpartum depression

Outcome measurements:

- + Postpartum depression: whether a person had any ICD-10 diagnosis code for depression (F530, F531, F538, F539, F32, F33) within three months following the index delivery date
- + Treatment types (among those with postpartum depression): whether a person received any of the following treatments within one month after their first diagnosis for postpartum depression:
- Prescription drug only:
- if the person only filled antidepressants
- No treatment
- Psychotherapy only: if the person only had psychotherapy

Covariates:

- + Age on the index delivery date (15-24, 25-34, and 45-64)
- + US Census regions (midwest, northeast, south and west)
- the SDOH score was then categorized into low, medium, high, and very high based on its quantile distribution
- physician assistant, behavioral care provider, other, and unknown)

Statistical analysis:

- women with postpartum depression

RESULTS

- + Characteristics of the study cohort were relatively stable year over year (Table 1). + The prevalence of postpartum depression increased from 9.3% pre-pandemic to 12.1% during the pandemic (p < 0.001), a relative increase of 30.1% (Figure 2).
- + Among 156,028 women with a diagnosis of postpartum depression in the 2018–2022 sample, 46.5% received no treatment. There were no significant changes in the prevalence of receiving no treatment before and during the pandemic (Figure 3).
- women with commercial insurance, and women who were first diagnosed by a nurse practitioner, physician assistant, or behavioral care (non-physician) provider (Table 2).

Figure 2: Prevalence of postpartum depression before and during the pandemic

Befor	o re p o po	ande stpar	emic tum ((Mar depre	ch 2 essio	018- n	-Fe	e bru Post	a ry 2 tpart	2 020 um d) epression
	9.3	%									90.7%
0	10	20	30	40	50	60	-	70	80	90	100

Figure 3: Prevalence of treatment choices before and during the pandemic among women with postpartum depression

efore pandemic (March 2018–February 2020)						
No treatment Rx only Psychotherapy only Both Rx and psychotherapy						
			35.8%	47.3%		
9.	8%					
/.1%						

Exclude: Patients without continuous coverage (allowing 45-day gaps) for at least one year before and at least four months after the index delivery date in each period

Exclude: Patients aged < 15 and > 64 on the index delivery date in each period

Exclude: Patients with any diagnosis for schizophrenia or schizotypal, delusional, or other non-mood psychotic disorders within one year before the index delivery date

- Both prescription drug and psychotherapy: if the person filled any antidepressants and had any psychotherapy

if the person had no treatment of any kind

+ Evernorth social determinants of health (SDOH) index: Selected characteristics of each census block from open-source data were mapped into six domains: economy, education, infrastructure, health, language/culture, and food access; each domain was assigned a contribution weight, and was then aggregated to compute an overall SDOH score for each census block; a higher SDOH score indicated a higher level of social needs;

+ Health insurance coverage on the index delivery date (commercial, Medicaid, Medicare, Medicaid-Medicare dual, exchange, self-pay, and other) + Provider type at the first visit with a diagnosis for postpartum depression during the three-month follow-up period (physician, nurse practitioner,

+ Descriptive statistics were used to describe the prevalence of postpartum depression and treatment choices before and during the pandemic + Multinomial logistic regression was used to assess the association between patient/provider characteristics and treatment choices among

+ The odds of receiving treatment for postpartum depression were higher among older women, women living in areas with low levels of social needs

Table 1: Characteristics of study cohort, 2018–2021

	2018 N = 351,630	2019 N = 336,342	2020 N = 344,038	2021 N = 417,253
	N (column %) unles	s otherwise noted		
Age at index delivery date				
15–24	87,081(24.8%)	79,360 (23.6%)	81,852 (23.8%)	101,019 (24.2%)
25-34	195,287 (55.5%)	187,466 (55.7%)	189,847 (55.2%)	231,573 (55.5%)
35-44	68,041 (19.4%)	68,209 (20.3%)	71,042 (20.6%)	83,395 (20.0%)
45-64	1,221 (0.3%)	1,307 (0.4%)	1,297 (0.4%)	1,266 (0.3%)
Patient's region				
Midwest	91,946 (26.1%)	86,121 (25.6%)	88,354 (25.7%)	116,680 (28.0%)
Northeast	58,819 (16.7%)	55,863 (16.6%)	55,519 (16.1%)	69,332 (16.6%)
South	119,848 (34.1%)	121,145 (36.0%)	133,786 (38.9%)	160,167 (38.4%)
West	81,017 (23.0%)	73,213 (21.8%)	66,379 (19.3%)	71,074 (17.0%)
Social determinants of health (SDOH) index				
Low	90,077 (25.6%)	85,351 (25.4%)	86,696 (25.2%)	102,570 (24.6%)
Medium	82,326 (23.4%)	77,307 (23.0%)	76,187 (22.1%)	95,730 (22.9%)
High	60,334 (17.2%)	55,557 (16.5%)	54,742 (15.9%)	69,075 (16.6%)
Very High	108,189 (30.8%)	105,093 (31.2%)	113,891 (33.1%)	138,780 (33.3%)
Unknown	10,704 (3.0%)	13,034 (3.9%)	12,522 (3.6%)	11,098 (2.7%)
Insurance type at index delivery date				·
Commercial	125,114 (35.6%)	131,553 (39.1%)	142,745 (41.5%)	156,983 (37.6%)
Medicaid	163,581 (46.5%)	158,480 (47.1%)	174,086 (50.6%)	227,562 (54.5%)
Medicare	352 (0.1%)	295 (0.1%)	222 (0.1%)	194 (0.0%)
Dual	297 (0.1%)	479 (0.1%)	314 (0.1%)	336 (0.1%)
Exchange	5,513 (1.6%)	7,661 (2.3%)	8,327 (2.4%)	10,946 (2.6%)
Self	11,900 (3.4%)	13,836 (4.1%)	13,535 (3.9%)	14,122 (3.4%)
Other	44,873 (12.8%)	24,038 (7.1%)	4,809 (1.4%)	7,110 (1.7%)
Among women with postpartum depression	, provider type at the fi	rst visit with postpartu	m depression diagnosi	S
Physician	12,487 (3.6%)	16,587 (4.9%)	17,358 (5.0%)	21,827 (5.2%)
Nurse practitioner	2,078 (0.6%)	3,104 (0.9%)	3,401 (1.0%)	4,755 (1.1%)
Physician assistant	248 (0.1%)	364 (0.1%)	370 (0.1%)	565 (0.1%)
Behavioral care (non-physician)	2,296 (0.7%)	2,466 (0.7%)	2,619 (0.8%)	3,721 (0.9%)
Other	121 (0.0%)	231 (0.1%)	237 (0.1%)	390 (0.1%)
Unknown	11,041 (3.1%)	13,141 (3.9%)	15,181 (4.4%)	21,440 (5.1%)
Women without postpartum depression	323,359 (92.0%)	300,449 (89.3%)	304,872 (88.6%)	364,555 (87.4%)
Number of births at the index delivery				
Single birth	333,501 (94.8%)	315,597 (93.8%)	320,703 (93.2%)	391,015 (93.7%)
Multiple births	18,129 (5.2%)	20,745 (6.2%)	23,335 (6.8%)	26,238 (6.3%)
Charlson Index during one year before index	delivery date			
None	298,604 (84.9%)	284,764 (84.7%)	290,977 (84.6%)	355,112 (85.1%)
1	44,126 (12.5%)	42,847 (12.7%)	44,014 (12.8%)	51,531 (12.4%)
2	5,543 (1.6%)	5,459 (1.6%)	5,657 (1.6%)	6,648 (1.6%)
3+	3,357 (1.0%)	3,272 (1.0%)	3,390 (1.0%)	3,963 (0.9%)
Pregnancy was high risk				
No	297,022 (84.5%)	280,428 (83.4%)	282,935 (82.2%)	336,431 (80.6%)
Yes	54,608 (15.5%)	55,914 (16.6%)	61,103 (17.8%)	80,822 (19.4%)

+ LIMITATIONS

- an employee assistance program (EAP). + The data lacks information on race/ethnicity and parity.

+CONCLUSIONS

- References: 2. Bauman BL, Ko JY, Cox S, D'Angelo DV, et al. "Vital signs: postpartum depressive symptoms and provider discussions about perinatal depression—United States, 2018." Morbidity and Mortality Weekly Report. 2020 May 5;69(19):575.
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HEALTH SERVICES

Table 2: Association between patient/provider characteristics and treatment choices, 2018–2021

	Prescription vs. no tre	drug only atment	Psychothe vs. no tre	rapy only atment	Both prescription drug and psychotherapy vs. no treatment	
	Odds ratios [95% Cl]	P-value	Odds ratios [95% Cl]	P-value	Odds ratios [95% Cl]	P-value
Age at index delivery date 15-24 (reference)			[00/00/]		Looke of	
25-34	1.15 [1.12, 1.18]	<0.001	1.28 [1.22, 1.34]	<0.001	1.44 [1.37, 1.52]	<0.001
35-44	1.17 [1.13, 1.22]	<0.001	1.46 [1.37, 1.54]	<0.001	1.67 [1.57, 1.78]	<0.001
15-64	1.35 [1.10, 1.66]	0.003	1.54 [1.12, 2.11]	0.008	1.70 [1.23, 2.36]	0.001
Patient's region /lidwest (reference)						
lortheast	0.68 [0.66, 0.71]	<0.001	1.48 [1.40, 1.57]	<0.001	0.94 [0.88, 1.00]	0.051
South	1.04 [1.01, 1.07]	0.013	0.85 [0.80, 0.90]	<0.001	0.92 [0.87, 0.98]	0.005
Vest	0.72 [0.70, 0.75]	<0.001	0.99 [0.94, 1.05]	0.8	0.82 [0.77, 0.87]	<0.001
ocial determinants of healt ow (reference)	th (SDOH) index		· · · · ·			
<i>l</i> edium	1.15 [1.11, 1.19]	<0.001	0.78 [0.74, 0.83]	<0.001	0.79 [0.75, 0.83]	<0.001
łigh	1.08 [1.04, 1.12]	<0.001	0.70 [0.66, 0.75]	<0.001	0.68 [0.63, 0.72]	<0.001
/ery High	1.18 [1.14, 1.22]	<0.001	0.66 [0.62, 0.71]	<0.001	0.67 [0.63, 0.71]	<0.001
Inknown	1.05 [0.99, 1.12]	0.13	0.80 [0.72, 0.89]	<0.001	0.68 [0.61, 0.77]	<0.001
nsurance type at index deliv commercial (reference)	very date		· · · · ·			
ledicaid	0.74 [0.72, 0.76]	<0.001	0.70 [0.67, 0.73]	<0.001	0.50 [0.48, 0.52]	<0.001
ledicare	0.72 [0.55, 0.95]	0.022	1.02 [0.72, 1.45]	>0.9	0.55 [0.35, 0.86]	0.008
Jual	0.45 [0.35, 0.59]	<0.001	0.98 [0.71, 1.36]	>0.9	0.67 [0.47, 0.96]	0.03
xchange	0.94 [0.86, 1.03]	0.2	0.81 [0.68, 0.95]	0.011	0.74 [0.63, 0.87]	<0.001
Self	0.95 [0.88, 1.02]	0.13	0.95 [0.83, 1.08]	0.4	0.87 [0.77, 0.99]	0.029
ther	0.95 [0.90, 1.01]	0.11	0.83 [0.75, 0.92]	<0.001	0.70 [0.63, 0.78]	<0.001
mong women with postpar hysician (reference)	tum depression, provider t	ype at the first visit w	ith postpartum depression	on diagnosis		
lurse practitioner	1.53 [1.47, 1.60]	<0.001	1.54 [1.41, 1.68]	<0.001	2.18 [2.02, 2.34]	<0.001
'hysician ssistant	1.85 [1.66, 2.07]	<0.001	1.30 [1.00, 1.69]	0.049	2.39 [1.98, 2.89]	<0.001
Sehavioral care	0.41 [0.37, 0.44]	<0.001	32.2 [30.2, 34.3]	<0.001	9.04 [8.42, 9.70]	<0.001
ther	0.73 [0.63, 0.84]	<0.001	2.56 [2.09, 3.12]	<0.001	1.12 [0.88, 1.43]	0.4
Inknown	0.72 [0.70, 0.73]	<0.001	1.67 [1.60, 1.75]	<0.001	1.03 [0.98, 1.08]	0.3
ad any depression diagnos	is during one year before t	he index delivery date	9			
/es	1.00 [0.98, 1.03]	0.8	2.23 [2.14, 2.32]	<0.001	2.24 [2.15, 2.33]	<0.001
harlson Index during one y	ear before delivery					
1	0.97 [0.94, 0.99]	0.015	0.99 [0.94, 1.03]	0.5	1.03 [0.98, 1.08]	0.3
2	0.91 [0.85, 0.98]	0.01	1.02 [0.92, 1.14]	0.7	1.11 [1.00, 1.24]	0.062
}+	0.88 [0.81, 0.95]	0.002	0.82 [0.71, 0.94]	0.005	0.84 [0.73, 0.98]	0.026
Periods March-October 2018 (refere	nce)					
larch-October 2019	1.10 [1.06, 1.14]	<0.001	0.95 [0.89, 1.01]	0.1	1.02 [0.95, 1.08]	0.6
larch-October 2020	1.08 [1.04, 1.12]	<0.001	1.06 [1.00, 1.12]	0.058	1.06 [1.00, 1.13]	0.059
March-October 2021	1.07 [1.03, 1.11]	<0.001	1.05 [1.00, 1.11]	0.076	1.07 [1.01, 1.13]	0.027

+ This study relied on medical claims data and, therefore, disregarded mothers with untreated postpartum depression.

+ This study might have underestimated the prevalence of using psychotherapies if these therapies were paid out of pocket or received through

+ The prevalence of postpartum depression increased significantly during the pandemic.

+ Almost half of women with postpartum depression continued to receive no treatment, raising concerns about the potential implications of untreated depression on the health and well-being of mothers and their families. The findings also reflect a lack of efforts in reducing access/stigma barriers to postpartum depression treatment and in increasing knowledge about the disease.⁵

+ The study highlighted potential socioeconomic and provider variation in postpartum depression treatment.

a. Certain population subgroups (e.g., younger women, women living areas with very high social needs, and women with non-commercial insurance coverage) were less likely to receive treatment than their peers.

b. Patients who saw a nurse practitioner, a physician assistant, or a behavioral care provider were more likely to receive the combined prescription drug-psychotherapy treatment than those who saw a physician. If the quality of treatment from nurse practitioners, physician assistants, and behavioral care providers is as good as that of physicians, then shifting postpartum routine care and depression screening to these providers may help reduce down stream costs and improve patient outcomes.

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