Mothers' Mental Health Care Use After Screening for Postpartum Depression at Well-Child Visits

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Received for publication June 21, 2018; accepted November 24, 2018.

Abstract

Objective: The American Academy of Pediatrics recommends postpartum depression (PPD) screening. It is unknown whether pediatricians are effective in linking mothers to mental health services. The objectives of the current study are to determine 1) mental health care use among women with Medicaid insurance after a positive PPD screen and 2) maternal and infant factors that predict the likelihood of mental health care use.

Methods: Retrospective cohort design of mothers attending their infants' 2-month well child visit at 1 of 5 urban primary care practices between 2011 and 2014. A linked dataset of the child's electronic health records, maternal Medicaid claims, and birth certificates was used. The primary outcome was mental health care use within 6 months of a positive PPD screen. Multivariate logistic regression was used to estimate maternal and infant clinical and sociodemographic factors that predict service use.

Results: In total, 3052 mothers met study criteria, 1986 (65.1%) completed the PPD screen, and 263 (13.2%) screened positive for PPD, of whom 195 (74.1%%) were referred for services. Twenty-three women (11.8%) had at least 1 Medicaid claim for depression within 6 months of screening. In multivariate modeling, mothers with a history of depression in the previous year (odds ratio = 3.80, 1.20−12.11) were more likely to receive mental health services after a positive screen.

Conclusions: Few mothers who screened positive for PPD received mental health services. Mothers without a recent history of depression treatment may be especially at risk for inadequate care. Additional mechanisms to improve access to mental health services after PPD screening are needed.

Keywords: depression; postpartum; screening; well-child care

Academic Pediatrics 2019;19:652−658

What's New

After a positive postpartum depression screen at their infant's well-child visit, few mothers receive mental health services. Mothers with new-onset depressive symptoms may be at particular risk for inadequate follow-up.

Postpartum depression (PPD) is common and affects 15% of all women,[1] with greater rates seen in women who are of low income and less educated.[2] Untreated, PPD negatively impacts a mother's ability to parent[3] and form a secure attachment with her infant.[4] PPD is associated with negative socioemotional development,[5] child behavior, and cognitive development.[6] In addition, PPD may have negative effects on the physical health of infants, as it is associated with decreased adherence to infant-safety practices[7] and a lower likelihood of breastfeeding.[8] Importantly, remission of maternal depression has been associated with improved child behavior.[9]

Recognizing the many negative consequences of PPD on the mother and infant, the US Preventive Service Task Force recommends universal screening for PPD.[10] Diagnosing and treating PPD is challenging, since despite recommendations for a postpartum obstetrics appointment, many women do not see a care provider of their own after delivery.[11] Instead, for many mothers, routine well-child care is their only reliable connection to a health system, and so there has been a shift within pediatrics to screen for PPD. Accordingly. the American Academy of Pediatrics recommends screening at infant well-child visits.[1]

Much of the literature on PPD screening at well-child visits has focused on the implementation of the screener,[12−14] provider education about PPD, and care coordination strategies when a mother screens positive.[15] Screening for PPD in pediatric settings has been found to be feasible and acceptable to providers[16,17] and mothers.[18] However, there is limited evidence on whether mothers who screen positive for PPD in pediatric settings receive appropriate treatment. One recent study examined maternal help-seeking behavior after a positive PPD screen in a pediatric setting and found that

37% of mothers self-reported having made and kept a mental health appointment.[19] However, there is still a gap in understanding whether there are certain maternal and infant clinical risk factors that predict which mothers are more likely to receive services. The present study seeks to address the gaps in the literature by taking a population-based approach to determine 1) mental health care use among women with Medicaid insurance after a positive PPD screen at the infant well child visit and 2) the maternal and infant sociodemographic and clinical factors that predict the likelihood of mental health care use after a positive PPD screen.

METHODS

This is a retrospective, population-based cohort study. The primary data sources included maternal Medicaid claims, birth certificate files, and the child's electronic health records (EHRs). This study was approved by the institutional review board of the Children's Hospital of Philadelphia.

SAMPLE

The target population was mothers whose infants had a 2-month well-child visit at 1 of 5 Philadelphia academic urban primary care practices between January 2011 and December 2014. Mothers were included if 1) maternal Medicaid claims were available for at least 4 months postpartum, and 2) there were no missing infant or maternal predictor variables. Mothers were excluded if the data sources were unable to be linked. In addition, because the focus of the present study is on PPD and not postpartum psychosis, mothers with a diagnosis of schizophrenia, bipolar disorder, or an antipsychotic in the 3 months before conception were excluded (N = 7) because these women are at high risk of developing postpartum psychosis.[20] In Pennsylvania, at the time the study was conducted, all mothers were eligible for 60 days of postpartum Medicaid coverage and had the option of applying for continued Medicaid coverage if they qualified. The study period occurred before Medicaid expansion.

SETTING

This study was conducted in Philadelphia from 2011 to 2014. In Philadelphia, there is a central nonprofit contracted by city government to oversee mental health services for Medicaid recipients. This central agency, in turn, contracts with local community mental health agencies that provide services. Medicaid recipients have the option of either calling the central agency or the local community mental health agency directly to receive services. Mothers were all recruited from primary care practices affiliated with the same academic teaching hospital in Philadelphia and staffed by attending pediatricians, pediatric nurse practitioners, and resident physicians. Beginning in 2011, these practices began screening for PPD at 2-month well-child visits. While in the waiting room, mothers completed the Edinburgh Postnatal Depression Scale (EPDS), a validated 10-item self-report scale that screens for PPD symptoms, on a tablet.[21] The EPDS was available in both English and Spanish. A positive screen was initially considered either a total EPDS score ≥9 or a score ≥1 on question 10, which assesses suicidality. To be consistent with the PPD screening guidelines of the American Academy of Pediatrics,[1] beginning in 2013, the practices transitioned to a total EPDS score ≥10 or a suicide score ≥1 as the new cut-off for a positive screen. The results of the screen are displayed within the EHR to the providers and providers are given a link to a printable handout of resources for the mother. The providers also are prompted to document in the EHR whether the mother was referred to services. All practices had an on-site social worker who could assist with mental health referrals at the discretion of the provider.

DATA

Data sources included 1) EHR for infants, which includes PPD screens of mothers; 2) birth certificates; and 3) maternal Medicaid claims. First, the EHR was queried to identify all infants with a 2-month well-child visit from January 1, 2011, to December 31, 2014, and the results of the mother's depression screen were abstracted. These records were in turn linked to a previously linked dataset of birth certificates and mothers' Medicaid claims.[22] The original linked dataset was created by first identifying infants through birth certificates and then using an iterative deterministic linkage approach[23] to link mothers and infants to Medicaid claims. This linkage was a sequential process based on Social Security numbers (when available) and unique identifiers constructed from the mother's and infant's dates of birth, and the mother's name. In addition, an EHR review was conducted to identify if the provider referred mothers to services and whether there was documentation of involvement of the onsite social worker.

OUTCOME VARIABLES

The primary outcome was depression treatment in the 6 months after a positive screen. Depression treatment was defined as either a Medicaid claim for a primary or secondary *International Classification of Diseases, Ninth Revision* (ICD-9) diagnosis of depression or anxiety or filling a prescription for an antidepressant medication (ascertained using GC3 codes). If a diagnostic code and pharmaceutical code were from the same encounter date, this date was considered a single treatment for depression. In keeping with the work on Medicaid claims and PPD by Kozhimannil et al,[24] a diagnosis of anxiety was included in the definition of depression because there is high comorbidity between depression and anxiety[25] and there may be misclassification in claims data. Depression treatment was categorized as having had 1 or more treatments, 2 or more treatments, or 3 or more treatments in the 6 months after the screen.

Since mothers with a positive PPD screen may have accessed care but been ultimately diagnosed with a

different mental health issue, a secondary analysis was conducted with the outcome of any mental health treatment in the 6 months after a positive screen. Mental health treatment was defined as a Medicaid claim for a primary or secondary ICD-9 diagnosis of depression, anxiety, schizophrenia, bipolar disorder, post-traumatic stress disorder, or a miscellaneous behavioral health diagnosis or filling a prescription for any psychotropic medication. Similarly, mental health treatment was categorized as having had 1 or more treatments, 2 or more treatments, or 3 or more treatments in the 6 months after screen.

Predictor Variables

The predictor variables included maternal age, marital status, race/ethnicity, education, and parity as ascertained from the child's birth certificates. In addition, previous depression treatment was defined as a Medicaid claim for a primary or secondary ICD-9 diagnosis of depression or anxiety or filling a prescription for an antidepressant medication in the year before the birth of the child. Similarly, previous mental health treatment was defined as a Medicaid claim for a primary or secondary ICD-9 diagnosis of depression, anxiety, post-traumatic stress disorder, or a miscellaneous behavioral health diagnosis or filling a prescription for any psychotropic in the year before the birth of the child. We included mother's score on the EPDS screener as a marker of severity of depressive symptoms. Finally, we included whether there was documented involvement of the onsite social worker.

Covariates

Other covariates included the primary care clinic and the mother's total number of months of Medicaid eligibility during the 8 months postpartum.

Analysis

Bivariate analyses (Chi-square and *t* test) were conducted comparing the maternal and infant factors of mothers who completed the EPDS and did not complete the EPDS. The prevalence of mental health care use for both the primary and secondary outcomes was estimated as the number of mothers receiving treatment out of the total number of mothers who both screened positive for PPD and were referred for services by the provider. Multivariate logistic regression was used to estimate the maternal and infant clinical factors that predict the likelihood of using services for both the primary outcome of depression treatment and the secondary outcome of any mental health treatment. In addition, sensitivity analyses varied the inclusion criteria for duration of maternal Medicaid eligibility (Supplementary Data). All analyses were conducted using Stata, version 15.0 (College Station, Texas).

Results

In total, 3052 mothers met the initial study inclusion and exclusion criteria. Of those, 1986 completed the EPDS screen (65.1%). Mothers who completed the EPDS were more likely to be first-time mothers as compared with mothers who did not complete the screen ($P = .03$). There were no statistically significant differences between those who completed the screen and who did not for the remainder of the infant or maternal factors. Of the mothers who completed the EPDS, 263 (13.2%) mothers screened positive for depression, and 195 (74.1%%) of them were then referred for services. Descriptive statistics for the analytic sample of the 195 mothers who were referred to services are presented in Table 1. Overall, the mothers were predominantly black/African American and single with full-term infants.

The mental health care use after a positive PPD screen and provider referral was low, with only 11.8% of the mothers referred for services receiving at least 1 depression treatment in the 6 months after the screen. The percentage of mothers receiving either 2 or more or 3 or more depression treatments decreased in a step-wise fashion from 5.6.% to 3.1%. When examining the subset of 27 mothers who had been treated for depression before the birth of their infant, 25.9% had at least 1 visit for depression in the 6 months after the PPD screen. When using the more broadly defined secondary outcome of any mental health treatment, the percentage of women receiving treatment in the 6 months after the screen was greater, with 17.4.%, 10.3%, and 7.2% having at least 1, 2, or 3 or more visits, respectively.

The results of the multivariate analysis with the primary outcome of any depression treatment in the 6 months after the screen are found in Table 2. Mothers who had depression treatment in the year before the birth of their child (odds ratio = 3.80, 1.20−12.11) were more likely to receive depression treatment after a positive PPD screen. Similarly, in the secondary analysis of the outcome of any mental health treatment after a positive screen, previous mental health treatment was predictive of postpartum mental health follow-up (odds ratio = 2.49, 1.06−5.83) (Table 3). No other maternal or infant sociodemographic or clinical factors were predictive of subsequent PPD treatment after a positive screen. There was no variation in receipt of mental health services after a positive screen by pediatric clinic. The results of the sensitivity analyses of varied duration of Medicaid enrollment can be found in the Supplementary Material and are consistent with the main analyses Table 3.

Discussion

In our study of predominantly low-income, African-American women, 13% of mothers screened positive for PPD. This rate of positivity is lower than what would be expected based on the demographics of our population. However, validation studies of the EPDS in low-income populations have shown lower sensitivity and specificity than in middle-income populations.[26] Since our population was predominantly low income, it is possible that we are seeing a greater false-negative rate than would be seen in a higher-income population. In addition, in our sample, mothers completed the EPDS on a tablet in the waiting room, and we conjecture whether this method of delivery may have impacted the validity of the measure. Future research validating the delivery of the EPDS in various

Table 1. Sample Characteristics (n = 195)

Characteristic	Received Services (n = 23)	Did Not Receive Services (n = 172)	*P* Value
Age of mother at time of visit, y, mean (SD)	28.1 (6.6)	27.0 (5.3)	.36
Child's age at time of visit, mo, mean (SD)	2.1 (0.2)	2.2 (0.2)	.03
Race/ethnicity (%)			.25
Non-Hispanic black	16 (69.7%)	130 (75.6%)	
Non-Hispanic white	2 (8.7%)	14 (8.1%)	
Hispanic	2 (8.7%)	10 (5.8%)	
Asian/Pacific Islander	2 (8.7%)	2 (1.2%)	
Unknown	1 (4.4%)	15 (8.7%)	
American Indian/Alaskan Native	0 (0%)	1 (0.6%)	
Marital status			.16
Single	21 (91.3%)	136 (79.1%)	
Married	2 (8.7%)	36 (20.9%)	
Education			.13
High school graduate or less	11 (47.8%)	89 (51.7%)	
Some college/associates degree	8 (34.8%)	73 (42.4%)	
Bachelor's degree or higher	4 (17.4%)	10 (5.8%)	
Gestational age of infant			.64
Term	20 (87.0%)	155 (90.1%)	
Preterm	3 (13.0%)	17 (9.9%)	
Parity			.42
Multiple children	15 (65.2%)	97 (56.4%)	
First child	8 (34.37%)	75 (43.6%)	
EPDS score mean (SD)	15.3 (5.0)	13.5 (3.8)	.04
Previous depression history			.01
No previous treatment	16 (69.6%)	152 (88.4%)	
Previous treatment	7 (30.4%)	20 (11.6%)	
Months of postpartum Medicaid coverage, mean (SD)	7.6 (0.7)	7.4 (1.1)	.48

SD indicates standard deviation; and EPDS, Edinburgh Postnatal Depression Scale.

settings is warranted. Last, the mothers in our sample completed the EPDS at 2 months' postpartum. It is possible that some mothers may have been previously identified as having PPD by their obstetricians or providers at the delivery hospital. If their symptoms were then adequately treated, they may not have continued to screen positive at the 2-month well-child visit.

Overall, few women who screened positive for PPD subsequently received mental health services. As compared with the one other study, to our knowledge, on

Table 2. Predictors of Mental Health Care Use for Depression

Variable	Odds Ratio (95% CI)	*P* Value
Mother's age	1.03 (0.92–1.15)	.64
Race/ethnicity		
Black/African American	0.40 (0.11–1.48)	.35
Non-black/African American	reference	
Marital status		
Married	0.22 (0.04–1.13)	.07
Single	reference	
Education		
College educated	1.52 (0.56–4.11)	.41
Less than college education	reference	
Parity		
First child	1.06 (0.34–3.30)	.92
Multiple children	reference	
Social work		
Social work involved	1.17 (0.35–3.86)	.80
No social work involvement	reference	
EPDS score	1.09 (0.98–1.22)	.10
Depression history		
Previous depression history	3.80 (1.19–12.11)	.02
No previous history	reference	

CI indicates confidence interval; and EPDS, Edinburgh Postnatal Depression Scale.

*Also controlled for clinic and total number of months of Medicaid eligibility.

Table 3. Predictors of Any Mental Health Care Use

Variable	Odds Ratio (95% CI)	*P* Value
Mother's age	1.01 (0.92–1.11)	.83
Race/ethnicity		
Black/African American	0.77 (0.24–2.44)	.66
Non-black/African American	reference	
Marital status		
Married	0.59 (0.19–1.83)	.36
Single	reference	
Education		
College educated	1.49 (0.65–3.41)	.35
Less than college education	reference	
Parity		
First child	0.69 (0.26–1.82)	.46
Multiple children	reference	
Social work		
Social work involved	0.91 (0.32–2.60)	.87
No social work involvement	reference	
EPDS score	1.09 (0.98–1.20)	.09
Mental health history		
Previous mental health history	2.49 (1.06–5.83)	.04
No previous history	reference	

CI indicates confidence interval; and EPDS, Edinburgh Postnatal Depression Scale.

*Also controlled for clinic and total number of months of Medicaid eligibility.

postpartum mental health follow-up from pediatric settings, which found a follow-up rate of 37%,[19] the mental health care use in our study was lower at 11.8%. Study methods may explain this difference; the present study used population-based datasets of all eligible mothers for sample ascertainment and an objective measure of mental health care receipt, which reduces subjective biases present with self-report. Overall, when women are screened and referred from their own care providers or community organizations, the reported mental health care use ranges from 12% to 35%,[27–29] with greater rates reported with interventions to facilitate referrals.[30] The mental health care use in our study is on the lower end of this reported range, which may reflect unique barriers to receiving services after a pediatrician provides the referral and/or the sociodemographic composition of our sample, which primarily included mothers with limited economic resources.

We also found that women without a recent history of depression treatment may be particularly at risk for inadequate treatment when PPD symptoms are identified by their child's pediatrician. We hypothesize that women with a recent history of depression treatment may already have a preferred mental health care provider and thus if depression recurs in the postpartum period the mother can reconnect with her provider. In addition, mothers with a history of treatment for depression may recognize their symptoms require treatment and are not a temporary state such as "postpartum blues." However, for women with newly diagnosed depressive symptoms, a new mental health care provider will likely need to be identified. This is further challenged by the fact that adult and pediatric providers may be in distinct health care systems, which can create logistical barriers to referrals. However, it is important to note that even though women with a previous history of depression received treatment in the postpartum period at greater rates than women without such a history, their rates of mental health care use were still quite low at 25.9%. Interestingly, the involvement of the on-site social worker was not associated with a greater likelihood of receiving mental health services. Future qualitative research should explore mothers' perceptions of social workers and care coordinator in facilitating access to care.

Since the field of pediatrics is committed to screening mothers for PPD,[1] our study, in which few mothers then received mental health services, highlights the importance of exploring novel means of referral and service delivery for PPD from pediatric settings. One approach, described by Olin et al, [31] is a stepped care pathway in which based on a risk assessment, the treatment may consist of education by pediatricians, behaviorally based interventions integrated into well child care, or facilitated referral to outside mental health care. Active, facilitated referrals to outside mental health providers have been shown to increase mental health care use for women with PPD.[30] An alternative approach to outside referral for mothers with PPD is to include treatment for PPD within the range of practices of mental health providers that work in integrated pediatric behavioral health models. For example, in one integrated pediatric behavioral health clinic, a behavioral health clinician is automatically consulted for all mothers who screen positive for pregnancy-related depression.[32] In another model of a co-located maternal mental health clinic within pediatric care, nearly one half of the mothers had at least 4 visits with the onsite psychiatrist, demonstrating substantially greater mental health care use than what was seen in our study.[33] Such co-located treatment approaches would be consistent with a recent Centers for Medicare and Medicaid Services Bulletin, which clarifies that a mother's mental health treatment may be reimbursable under the child's Medicaid if it has "direct benefit of the child" and is delivered to the mother and child together.[34] This approach of co-located mental health treatment for the mother within the pediatric office may help overcome many of the logistical barriers to PPD treatment, such as provider location,[28] transportation, and childcare,[35] and further investigation of implementation and reimbursement strategies are warranted.

There are several limitations to this study. First, the outcome measures were ascertained from Medicaid claims; therefore, mental health treatment not billed through Medicaid (ie, charity care, self-pay) was unobserved and not included in the outcome. Similarly, if a mother participated in any adjunct support services (ie, parenting groups, home visiting services), it is at the providers' discretion to inquire about such services and document in the EHR. To avoid bias due to variation in provider practices and documentation, we instead chose an objective measure of receipt of mental health services using Medicaid claims. Second, we are unable to determine whether variation in maternal service receipt was related to variation in provider referral practices after a positive screen. Third, even if a mother's depression treatment was reimbursable by Medicaid, the provider may not have used the appropriate ICD-9 code. However, this limitation was minimized by the secondary analysis of receiving any mental health treatment, and not just depression treatment, in the postpartum period. Fourth, to be eligible for inclusion in our study, mothers were not restricted to those continuously eligible within the Medicaid program for the either the 6-month post-screen follow-up period or 12-month prepartum period and results therefore reflect only observable health care use during periods of Medicaid coverage. However, inclusion criteria of continuous Medicaid enrollment would not be reflective of the experiences of most women and our expanded inclusion criteria increased generalizability of our findings. Furthermore, the total number of months of Medicaid coverage was adjusted for in the multivariate analyses and in sensitivity analyses using varying inclusion criteria for Medicaid enrollment, our findings remained consistent. In addition, due to the constraints of the data available, we did not have Medicaid claims for mothers for more than a year before the birth of the child and so do not have information on more distant treatment for depression or other mental illnesses. We also cannot tell from the Medicaid claims whether a mother's previous depression treatment was

continued into the postpartum period versus reinitiated in the postpartum period. However, since nearly three quarters of those with previous depression treatment did not have any depression treatment after they screened positive, even continuing already existing treatment in the postpartum period may be challenging and is an area worthy of intervention. Finally, we do not know why mothers did not receive care and what barriers they may have faced. Future qualitative research on care seeking in this population may elucidate these barriers and guide the development of interventions.

CONCLUSIONS

Overall, the mental health care use for women who screened positive for PPD at their child's well child visit was low. Mothers without a recent history of depression treatment may be especially at risk for inadequate follow-up. Future research is needed on how to best optimize referral mechanisms to adult mental health services from pediatric providers. In addition, co-located treatment approaches that take advantage of new Medicaid reimbursement strategies for PPD screening and parent−infant therapy should be explored. These approaches may be especially important for populations experiencing new-onset depressive symptoms.

ACKNOWLEDGMENTS

Financial disclosure: This work was funded by the Eisenberg Scholar Research Award, University of Pennsylvania. Stacey Kallem was the principal investigator. The funding source had no involvement in the collection, interpretation, or analysis of the data.

SUPPLEMENTARY DATA

Supplementary data related to this article can be found online at https://doi.org/10.1016/j.acap.2018.11.013.

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