



Improving Postpartum Depression Screening in Pediatric Primary Care: A Quality Improvement Project

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ARTICLE INFO

Article history:

Received 23 August 2018
Revised 24 February 2019
Accepted 1 March 2019

Keywords:

Postpartum depression
Pediatrics
Primary care

ABSTRACT

Background: Despite recommendations for standardized postpartum depression screening in primary care pediatricians, few pediatric healthcare providers are adequately screening mothers for postpartum depression.

Aims: To improve standardized screening for postpartum depression in the pediatric primary care setting. Secondary aims were to determine if infant and family characteristics (gender of infant, feeding method, insurance type, income level, ethnicity of infant) were associated with positive postpartum depression screening.

Methods: This quality improvement project involved implementing a standardized postpartum depression screening tool into pediatric primary care practice. Independent samples *t*-test and logistic regression were used for data analysis.

Results: Postpartum depression screening practices improved from 83% to 88% ($p = 0.096$). Although not statistically significant, infant characteristics of male gender, Medicaid or sliding-scale payment for services, and Hispanic ethnicity were associated with higher rates of positive postpartum depression screens.

Conclusions: Pediatric health care providers can effectively screen for postpartum depression. Certain infant and family characteristics may alert the provider to higher risks for mothers.

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Introduction

Problem description

Postpartum depression (PPD) is defined as major depressive disorder occurring within the year after a mother has given birth (Brummelte & Galea, 2015). Between 10 and 20% of mothers suffer from PPD in the year after giving birth, making PPD the leading maternal mental health condition associated with pregnancy and childbirth (American Psychological Association, 2017; Centers for Disease Control and Prevention [CDC], 2017). Prevalence estimates for PPD may not accurately reflect the true numbers of the condition due to it being largely underdiagnosed (Cox, Sowa, Meltzer-Brody, & Gaynes, 2016). Under-diagnosis of PPD has been attributed to many factors, but often women suffering from symptoms of PPD are not readily identified because they do not have regular access to a healthcare provider after delivery or because appropriate screening practices are not in place (Di Florio & Meltzer-Brody, 2015).

The literature recognizes several risk factors associated with PPD; these risk factors include several characteristics specific to the mother, such as sleep disturbance (Okun, 2016), disability (Mitra et al., 2014),

and previous mental health disorders (Martini et al., 2015). Additionally, infant characteristics such as prematurity and illness have been identified as risk factors for maternal PPD (Vigod, Villegas, Dennis, & Ross, 2010). Associations of maternal PPD with individual and family characteristics of healthy infants (i.e. gender, ethnicity, income level) do not appear in the literature.

This quality improvement (QI) project was conducted at a nurse-managed federally-qualified health center (FQHC) in northern Indiana. A gap in screening practices was recognized in regards to PPD screening among mothers of pediatric patients seen in this clinic. Prior to this study's intervention, the clinic's practice was to "screen" mothers for PPD at all infant well-child checks (WCC) visits by asking the question "Maternal depression: yes or no?" at the point of patient intake, which did not meet the American Academy of Pediatrics (AAP) recommendations for PPD screening and did not accurately identify mothers at risk. A retrospective analysis study that evaluated the use of formalized standard PPD screening tools showed effectiveness of such tools (Lind, Richter, Craft, & Shapiro, 2017). A systematic review by El-den, O'Reilly, and Chen (2015) concluded that PPD screening using standardized screening tools is acceptable to most postpartum women and healthcare professionals, including pediatricians. The literature demonstrates that pediatric healthcare providers (PHPs) can effectively screen for PPD (Fernandez y Garcia et al., 2015), and the benefits of PPD screening in the pediatric

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office have been cited as improved maternal mental health, improved child cognitive development, and improved infant feeding habits (Gaffney, Kitsantas, Brito, & Swamidoss, 2014; Liu et al., 2017; van der Zee-van den Berg et al., 2017).

Rationale

The American College of Gynecologists and Obstetricians (ACOG, 2015) recommends that women be screened for PPD at least once during the perinatal period. On average, women have one postpartum visit with their obstetrician at approximately 6 weeks after delivery (Kurtz, Levine, & Safyer, 2017); however, PPD can occur at any time during the postpartum year (ACOG, 2015). The AAP has recognized that infant WCC visits represent an opportunity to screen for PPD and in 2010 issued recommendations for pediatric healthcare providers (PHPs) to screen mothers for PPD in the pediatric setting; these recommendations were reaffirmed in 2014 (AAP, 2014). Incorporating PPD screening into pediatric primary care also aligns with the Health Care Quality and Outcome Guidelines for Nursing of Children and Families goal for every child and family to have a health care home (Betz, Cowell, Craft-Rosenberg, Kragicek, & Lobo, 2007). As the center of the pediatric health care home, PHPs have an obligation to address factors that impact an infant's health; because maternal mental health is a determinant of infant health (Weissman et al., 2015; Wikramarante et al., 2011), this obligation extends to addressing PPD.

Postpartum depression impacts not only the mother, but it also affects the family, most notably the infant (Ertel, Rich-Edwards, & Koenen, 2011). Untreated PPD is associated with lower rates and shorter duration of breastfeeding (Wouk, Stuebe, & Meltzer-Brody, 2017), poor maternal-child bonding, child and infant developmental delays, and poor mental health outcomes in childhood (Netsi et al., 2018). For these reasons, the PHP has a vested interest in early identification of maternal PPD and is uniquely positioned to have contact with new mothers at regularly scheduled intervals, resulting in significantly more face time with new mothers than the obstetrician/women's healthcare provider (Kurtz et al., 2017; Liberto, 2012).

Guidelines from the AAP specifically recommend incorporating the Edinburgh Postnatal Depression Scale (EPDS) at WCC visits that correspond with peak timing of PPD in mothers (Cox, Holden, & Sagovsky, 1987). These guidelines suggest screening at all WCC visits, but at least the 1, 2, and 6-month visits (AAP, 2014). Despite those recommendations, there is no standardization among pediatric practices to guide the implementation of PPD screenings; furthermore, the rates of PPD screening in the pediatric setting are low (Evans, Phillippi, & Gee, 2015; Glasser et al., 2016; Walker, Im, & Tyler, 2013).

Specific aims

In order to integrate standardized PPD screening in the clinic and determine its potential effect in increasing PPD detection, the project manager developed a QI project with a primary aim of increasing the rates of standardized PPD screening at 1, 2, and 6-month WCC visits. Secondary aims of the study included assessment of infant and family characteristics (race/ethnicity, income level, feeding practices, and insurance status) and association with PPD risk in mothers. Based on the Plan-Do-Study-Act (PDSA) framework for QI (Agency for Healthcare Research and Quality [AHRQ], 2015) (Fig. 1), the project manager defined the goals for the project and then met with clinic staff and PHPs to determine a timeline for implementing the EPDS into WCC visits. After preparing clinic staff for implementing the intervention, the intervention period ran from January 1, 2018 through March 31, 2018; however, as a process change, the clinic administrators approved the EPDS to be implemented as a permanent change to clinic practice.

Methods

Context

This QI project took place in a nurse-led, rural FQHC in north-central Indiana. The health center offers primary care services, including pediatrics, family health, women's health, and behavioral health. For this QI project, the pediatric and family nurse practitioners were the PHPs responsible for the direct examination of infants. The nurses and medical assistants (MAs) administered the EPDS screens and entered the scores into the electronic health record (EHR). Once scored in the EHR, the PHPs determined further action needed based on scores. Subjects included mothers of infants presenting for 1-month, 2-month, or 6-month WCC visits during the designated time period. Inclusion criteria were mothers of infants presenting for their child's 1, 2, or 6-month WCC visit who spoke either English or Spanish. Mothers who had a known diagnosis of depression prior to pregnancy were excluded from the study.

Selection of a standardized screening tool

The AHRQ framework guides healthcare providers to utilize formal standardized screening tools as the baseline for identifying PPD risk in women with unknown mood states (Gaynes et al., 2005). The EPDS is a validated screening tool that is available in many different languages. It is a simple 10-item self-report questionnaire that helps clinicians identify women at risk for PPD, and it is widely accepted as the most reliable screening method for PPD as it assesses for depression symptoms, anxiety symptoms, and suicidality (Cox et al., 1987; Cox, Holden, & Henshaw, 2014). With an internal consistency level of 0.83 by means of Cronbach's alpha coefficient, the EPDS has a sensitivity of 92% and a specificity of 73% when detecting depressive disorders (Bunevicius, Kusminskas, & Bunevicius, 2009). It has been validated for use throughout the postpartum year, and its reliability of differentiating PPD from the less-serious "baby blues" has been demonstrated (Castle, 2009). It is important to note that the EPDS is not diagnostic of PPD, but rather identifies a mother's risk based on her total score (>10 suggests a risk for PPD). Based on the AHRQ framework, the project manager utilized the EPDS to identify PPD risk in mothers at 1, 2, and 6-month WCC visits, based on literature that suggests maternal depression most commonly starts 1–3 weeks after birth and peaks at approximately 6 weeks, 2–3 months, and 6 months postpartum (AAP, 2014; ACOG, 2013).

Intervention

In concordance with the AAP evidence-based guidelines, the intervention involved utilizing a standardized screening tool, the EPDS, at 1, 2, and 6-month WCC visits to determine if risk for PPD could be better identified as compared to current practice. The project intervention was a team-based approach wherein the EPDS screen was administered by the nurse or MA, and then the PHP reviewed the screen and implemented the next step based on score (Table 1 describes responses of PHP based on score). The EPDS screening questions were integrated into the intake process for 1, 2, and 6-month infants who presented for WCC visits at the health clinic. Laminated versions of the EPDS were given to mothers when they presented for their child's WCC; mothers filled in the answers to the questions during the intake process. The nurse or MA entered the responses into the EHR to minimize time spent asking questions, and the EHR scored the completed EPDS. During the visit, the infant's PHP reviewed the screen and assessed risk based on score. Using the clinic's EHR, quick-text documentation was created that allowed the PHP to identify a mother's risk based on her score and to be directed toward further intervention (Table 1).

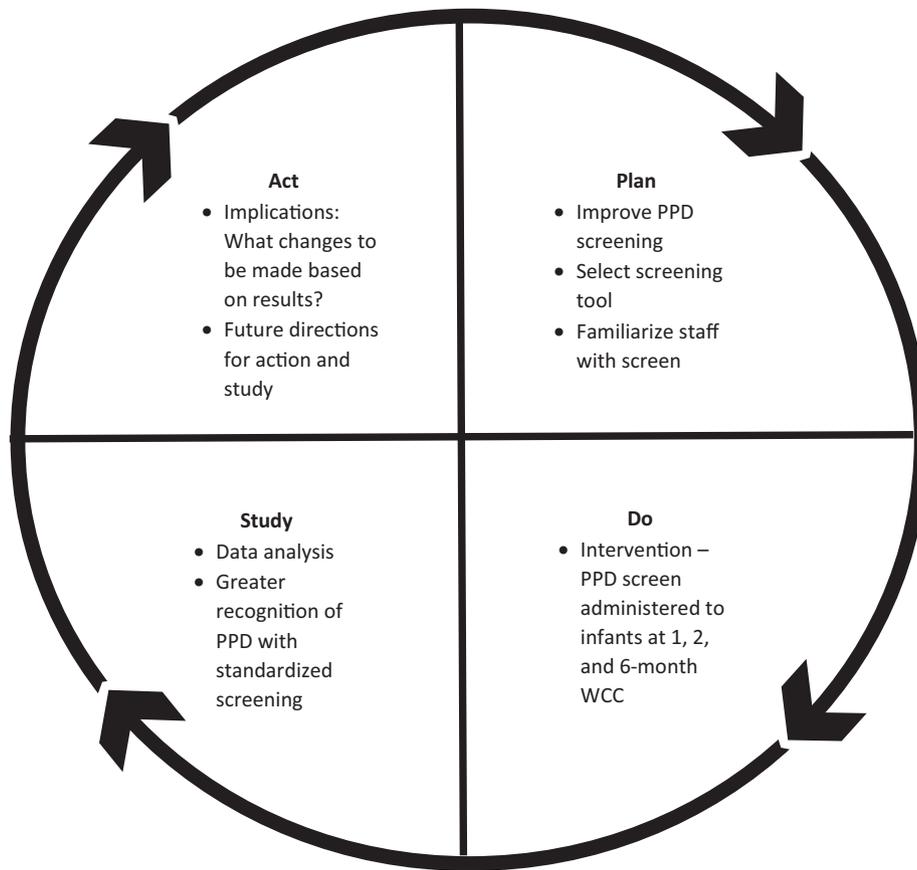


Fig. 1. Plan, Do, Study, Act. Representation of Plan-Do-Study-Act chart related to quality improvement of implementing standardized postpartum depression screens. Adapted from “Plan-Do-Study-Act (PDSA) Cycle” from the Agency for Healthcare Research and Quality, 2013, Retrieved from <https://innovations.ahrq.gov/qualitytools/plan-do-study-act-pdsa-cycle>.

Measures

Baseline assessment

Initially, pre-data was collected to assess for baseline PPD prevalence at the clinic. A query was run in the EHR to identify the infants during a one-year period (Jan 1, 2017–Dec 31, 2017) in whose charts it was documented that mothers were asked about PPD. Eighty-seven charts were retrieved and reviewed. The data included the responses of mothers at 1, 2, and 6-month WCC visits to the clinic’s maternal depression screening questions which asked: “maternal depression: yes or no;” a “yes” answer was considered positive. Data on infant and family characteristics were also collected (gender of infant, infant feeding practices, insurance type, family income level, and ethnicity).

Post-intervention assessment

After the 3-month intervention period, similar data was collected for the post-intervention group from a total of 50 charts eligible for review. The numeric score of the EPDS was used as post-intervention data; a

score of 10 or higher was considered positive. Infant and family characteristics for each infant whose mother was screened were also recorded.

Analysis

Data collected for this project were analyzed using quantitative analytical methods. Using the Statistical Package for the Social Sciences (SPSS) version 22 (IBM Corp. Released, 2013), an independent-samples *t*-test was run to determine the primary outcome of whether screening practices improved from the pre-intervention group to the post-intervention group. Logistic regression was then used to determine whether there was a higher association of positive PPD screens in the pre-intervention group or the post-intervention group as well as to determine whether certain infant characteristics were associated with positive screens. An estimate of the sample size was not done due to the limited timeframe of the intervention. The pre-intervention data was collected from a 12-month period, and the intervention period ran for 3 months.

Table 1
Quick text codes.

Score	Quick text documentation
0–9	Mother’s EPDS score indicates low risk for PPD. Continue routine care.
10–19	Mother’s EPDS score indicates risk for PPD. Social worker given a “warm handoff” at the end of patient’s visit to meet with mother. Educational handouts and resource information given.
>19	Mother’s EPDS score indicates high likelihood of PPD. Social worker given a “warm handoff” at the end of patient’s visit to meet with mother. Encounter documented in a separate office note in patient’s chart. Mother’s PCP notified.
Positive score on question 10	Mother’s response to EPDS question #10 indicates suicidality. Mom immediately seen by our social worker for crisis intervention at the end of patient’s visit. Encounter documented in a separate office note in patient’s chart. Mother’s PCP notified.

Ethical considerations

Prior to initiation of the study, approval was received from the Institutional Review Board. The United States Preventive Services Task Force (USPSTF) recommends that screening for depression be implemented “with adequate systems in place” to ensure that there are appropriate protocols in place for individuals who identify as being in need of referral, treatment, or further assessment (USPSTF, 2016, p. 382). Prior to implementing the EPDS intervention, a safety plan was developed to address positive screens and screens that indicated increased suicide or infant harm risk. Mothers who had a positive screen were to be referred internally to the clinic mental health team; suicidal mothers and mothers at increased risk for infant harm were directly handed off to clinic social workers per the clinic’s crisis response policy. To minimize ethical concerns surrounding the care continuity of women who screened positively for PPD, clinic staff and PHPs were educated about the use of the EPDS form and protocol to incorporate behavioral health for positive screens before the intervention period began.

Results

Characteristics of sample

The responses of 116 women were used for data analysis. The pre-intervention group included 72 total mothers who were screened for PPD at any 1, 2, or 6-month well-child visit during the period of January 1, 2017 through December 31, 2017. The post-intervention group included a total of 44 mothers who were screened for PPD using the EDPS at any 1, 2, or 6-month well-child visit during the period of January 1, 2018 through March 31, 2018. Table 2 shows the characteristics of the sample.

Postpartum screening process

During the 12-month pre-intervention period, there were 87 1, 2, or 6-month WCC visits where the infant’s mother was eligible for PPD screening. Of those 87 visits, 72 screening responses were documented (83%). Of the 50 screening opportunities in the 3-month intervention period, 44 mothers were screened (88%). Although not statistically significant at the 5% level ($p = 0.096$), an improvement in screening rates from 83% to 88% was found.

Positive screens by WCC and infant characteristics

Logistic regression analysis demonstrated that mothers screened at 1-month WCC visits had higher rates of PPD screening than those

Table 2
Characteristics of sample.

Variable	Total percentage	Pre percentage	Post percentage
Female infant	50%	45.2%	56.8%
Male infant	50%	54.8%	43.2%
Insurance: medicaid	76.7%	73.6%	81.8%
Insurance: sliding	7.6%	9.7%	4.5%
Insurance: private	15.5%	4.5%	13.6%
Feeding: bottle	59.5%	59.7%	59.1%
Feeding: breast	19.0%	19.4%	18.2%
Feeding: both	21.5%	20.8%	22.7%
Ethnicity: not Hispanic/Latino	88.8%	88.9%	88.6%
Ethnicity: Hispanic/Latino	11.2%	11.1%	11.4%
Monthly income: <2000	43.1%	45.8%	25.0%
Monthly income: ≥2000	33.6%	31.9%	38.6%
Monthly income: refused	23.3%	22.2%	36.4%

Note: $n = 116$. Total column represents percentages of total sample (combined pre-intervention and post-intervention groups).

Table 3
Coefficients representing associations of infant characteristics with positive EPDS.

Variable	Estimate	P-value	Odds ratio
Intercept	−1.898	0.041	0.150
Male infant	0.575	0.299	1.777
Insurance: medicaid	0.754	0.373	2.147
Insurance: sliding	0.839	0.458	2.314
Feeding: bottle	−0.221	0.747	0.802
Feeding: both	−0.960	0.261	0.383
Ethnicity: Hispanic/Latino	1.196	0.095	3.306
Monthly income: <2000	−0.687	0.270	0.503
Monthly income: refused	−0.779	0.296	0.459

Note: Interaction effects with post group were not significant.

at either 2 or 6-month visits (15.9% compared to 13.6% and 8.7% respectively). Male gender, Medicaid or sliding fee scale payment for services, and Hispanic ethnicity were infant characteristics associated with higher likelihoods of positive PPD screenings for both the pre- and post-intervention groups. Mothers of infants who were bottle (formula) fed or combined fed (formula and breast) were associated with lower rates of positive PPD screening than mothers of exclusively breastfed infants. There was a lower likelihood of positive PPD screening among mothers of infants whose families earned less than \$2000 a month or refused to provide income information than those from families who earned \$2000 or more a month. There were no significant differences in infant characteristics associated with PPD between pre- and post-intervention groups (Table 3).

Discussion

Summary

The results of this study support recent QI projects by Emerson, Mathews, and Leeza (2018) and Mgonja and Schoening (2016) that demonstrated feasibility of integrating standardized PPD screenings into WCCs in pediatric primary care. Implementing a standardized screening tool to identify risk for PPD can lead to higher rates of screening as well as greater identification of PPD risk in new mothers.

Higher rates of positive PPD screens were found at the 1-month WCC visit, which supports the consensus that PPD starts about 1–3 weeks after childbirth (ACOG, 2013) and has a peak at around 6 weeks postpartum (AAP, 2014) and underscores the need for screening at this critical time. The associations of certain infant characteristics with positive PPD screens were variable; however, the results highlight the need for the PHP to be aware of demographic and socioeconomic attributes that may place a mother at higher risk for PPD symptoms.

In contrast to previous literature that have found lower rates of PPD with exclusive breastfeeding (Figueiredo, Canário, & Field, 2014), this study found lower rates of positive screens with bottle feeding or combination bottle/breastfeeding. This could be due to low rates of breastfeeding in the sample (19%). Reports of higher rates of PPD in early breastfeeding have been published; these higher rates are potentially due to difficulty and lack of support perceived by some women who are initiating breastfeeding (Watkins, Meltzer-Brody, Zolnoun, & Stuebe, 2011). Extended breastfeeding has been found to have a protective factor against PPD (Borra, Iacovou, & Sevilla, 2015). These theories are supported by this QI project; more infants were exclusively breastfed at the 1-month WCC than at the 2 or 6-month visits, which was also the visit with the highest rate of positive PPD screens.

Interpretation

Postpartum depression that goes unrecognized or untreated puts a cost burden on society and the healthcare system. A study from the University of Maryland concluded that mothers who suffer from PPD

incur higher overall healthcare costs when compared to mothers who do not suffer from PPD (Dagher, McGovern, Dowd, & Gjerdingen, 2012). Depressed mothers in the study were more likely than non-depressed mothers to utilize the emergency room as well as incur mental health counseling costs. Other literature points out PPD have been associated with lower employment levels and income in mothers affected by the condition (Sontag-Padilla, Schultz, Reynolds, Lovejoy, & Firth, 2013). Children of mothers who suffer from PPD have also been found more likely to incur healthcare costs at a higher rate than infants of non-depressed mothers in the forms of more office and emergency room visits (National Business Group on Health, 2011). In contrast, the costs associated with PPD screening are minimal. The EPDS form is free for clinics to use and easily available on the Internet. A cost-effectiveness analysis by Wilkinson, Anderson, and Wheeler (2017) found significant healthcare savings for postpartum women when PPD screening and treatment was a routine part of postnatal care. Pediatric healthcare providers' bill for the EPDS screen, and extra visit time incurred due to positive screens and referrals may lead to upcoding for the visit. This would likely offset the clinic cost of extra time spent per patient/family. Due to the limited research and inconclusiveness of existing studies, further analysis is needed to determine the costs or savings associated with PPD screening in pediatric primary care.

Limitations

Limitations for this study exist. First, assessment of PPD risk was determined using data retrieved from infant charts. This did not translate into the mothers' charts, and it was not known if mothers were also patients at the clinic. Attributes of the mothers themselves were not assessed, which may have impacted results. Additionally, while data was retrieved from WCC visits categorized as 1, 2, and 6-month, some infants may have not presented to those appointments during those specific time frames (for example, a 4 month old infant may have presented for a late 2-month WCC). This may have affected the results of analysis for specific WCC visits. Furthermore, the pre-data responses to the question "Maternal depression: yes or no?" were self-report by mothers; there was no qualifier on that question to specify whether that meant that the mother had been diagnosed with depression, had previously suffered from depression, or was currently experiencing symptoms of depression. This may have represented either an under or over estimate of women in the pre-intervention group who were experiencing PPD symptoms. Furthermore, data was only collected at a FQHC and did not include data from mothers of infants at private practices; this limited sample was not likely representative of the general population.

Conclusions

Postpartum depression screening in the pediatric primary care setting is feasible and can help identify mothers at risk for PPD. Integration of a standardized screening tool, such as the EPDS, allows PHPs to detect early PPD symptoms and initiate timely interventions. Additionally, certain characteristics that are attributed to infants may alert the PHP to higher risks for mothers.

Future investigations should focus on the challenges and opportunities of PPD screening in pediatric primary care. Greater identification of PPD risk incurs greater needs for PPD resources, and PHPs must be aware of the resources available for mothers and must have a plan in place should they encounter a mother at risk for harming herself or her infant. Time constraints on the PHP to adequately discuss screening results and ensure appropriate follow-up may also be a challenge. Studies should look at how implementing screening impacts clinic productivity and comfort levels of the PHP on interpreting and addressing screening results. The feasibility of maternal health referrals from the PHP office is also something that must be considered. Future studies may also address identifying PPD risk in non-mother

caregivers (fathers, grandparents, foster parents) in the pediatric primary care setting.

Declaration of interest

None.

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