CJIM | Original Research

Increasing Postpartum Depression Screening in the Pediatric Setting

Juliana Stone, MD, MS [1,2], Lauren Allen, MD[1,3]

[1] University of North Carolina School of Medicine, 321 S Columbia St, Chapel Hill, 27516, NC, United States
[2] Department of Pediatrics, Stanford Children's Health & Lucile Packard Children's Hospital, 725 Welch Road, Palo Alto, 94304, CA, United States
[3] Department of Pediatrics, Duke University School of Medicine, Box 3352, DUMC, Durham, 27710, NC, United States

Statement of Significance

Undetected postpartum depression has adverse health effects on both the affected mother and her child. In the context of growing literature supporting universal screening for postpartum depression, this quality improvement project aimed to implement screening within the context of pediatric well child visits. Screening for postpartum depression in the pediatric setting is feasible and can lead to identification of postpartum women in need of further evaluation that might not otherwise garner provider attention. Implementing simultaneous quality improvement processes in two different sites and sharing lessons learned with a broader healthcare network can expedite effective innovation.

Background: Postpartum depression (PPD) affects 10-15% of new mothers. The long-term sequelae of untreated PPD on both the mother and child are well documented in the literature. Historically, formal screening has not been a standard part of pediatric visits since the focus of the visit is on the infant as the patient. However, the frequent check-ups throughout the first year of life serve as a reliable touchpoint during which screening can be done, and the American Academy of Pediatrics (AAP) recommends screening in this setting.

Methods: Two clinics simultaneously aimed to improve the usage of the Edinburgh Postpartum Depression Scale as a screening tool for PPD at the 1-month, 2-month, 4-month, and 6-month well child checks. Clinic A is a pediatrics practice, and clinic B is a combined internal medicine and pediatrics practice. After an initial roll-out period in February 2019, Plan-Do-Study-Act cycles were conducted over a 3-month period (March to May 2019) to determine how to reliably and universally incorporate this screening into all applicable visits in the two different clinic settings.

Results: The overall screening rate at clinic A rose from 57% at the beginning of March to 90% at the end of May. Clinic B's rose from 44% at the beginning of March to 89% at the end of May. With increased screening, there was a rise in both the percentage and the absolute number of women with positive screens.

Conclusions: Screening for PPD in the pediatric setting is feasible and can lead to identification of caregivers in need of further evaluation for PPD that might not have otherwise come to provider attention. Implementing simultaneous quality improvement processes in different sites and sharing findings with a broader healthcare network can expedite effective innovation.

DOI: 10.47265/cjim.v1i1.539

Corresponding Author:
Juliana Stone, MD, MS,
University of North Carolina School of Medicine, 321 S Columbia St, Chapel Hill, 27516, NC, United States
(Juliana_stone@med.unc.edu)

Postpartum depression (PPD) is common and affects both the parent and offspring. PPD is broadly defined as a major depressive episode that begins prior to or up to a year after parturition.[1] The impacts of PPD on child health have been well documented.[2,3] The Centers for Disease Control and Prevention (CDC) identify PPD as one of the most common adverse childhood experiences (ACEs) and as the ACE associated with the costliest long term health outcomes.[4] Physical growth can lag, motor delay can be detected starting around 6 months,

and language delays are evident as early as 12 months.[5] Children of mothers with PPD are more likely to struggle with a mental health disorder, develop gastrointestinal issues, and experience more emergency room visits.[6]

Remission of PPD is associated with improved functioning in offspring and identifying PPD is an essential first step in the treatment continuum.[7–9] Around 10-15% of new mothers will experience PPD.[10,11] However, PPD remains underdiagnosed and undertreated. A recent systematic review identified that only 30.8% of women with PPD are identified, 15.8% receive any treatment, 6.3% receive adequate treatment, and only 3.2% achieve remission.[12] We identify two overarching factors that contribute to missed diagnoses: variability in presentation and lack of structured monitoring.

First, a uniform clinical presentation of PPD persists in the minds of both the public and healthcare providers, but in reality PPD has heterogeneous presentations.[2,13] PPD can manifest with dominant symptoms of depressed mood, anxiety, or anhedonia.[14] Temporal variations in onset further complicates diagnosis. In response, universal screening of pregnant and postpartum women is widely recommended, including by the United States Preventive Services Task Force (USPSTF).[14,15] Multiple studies have shown a significantly higher detection rate of depressive symptoms in universally screened groups compared to groups requiring clinical suspicion or spontaneous detection by providers for diagnosis.[16–18]

Second, the responsibility for identifying and treating PPD falls in between multiple specialties. Often, the most frequent interaction new parents have with the healthcare system is at pediatric well-child checks (WCCs). Although the infant is technically the patient during these encounters, screening for PPD is within the scope and responsibility of the pediatrician as the short- and long-term consequences of PPD affect offspring. In 2010, the American Academy of Pediatrics (AAP) recommended screening for PPD at all WCCs.[19] Despite this, in a 2013 survey of AAP members, only 44% of pediatricians reported informally inquiring or formally screening mothers for depression.[20]

The Edinburgh Postpartum Depression Screen (EPDS) is a ten-item questionnaire and is the most widely used screening tool for PPD. Questionnaire items inquire about mood symptoms including guilt, sadness, and anxiety, physical manifestations of PPD including trouble sleeping and frequent crying, and thoughts of self-harm. A higher score indicates a greater likelihood that the patient is experiencing PPD, though the exact cutoff values that maximize sensitivity and specificity vary by population.[21]

Methods

Clinic A and B ran distinct but simultaneous quality improvement (QI) processes, with areas of intentional overlap based on shared learnings to maximize the diversity of interventions and evaluate how screening could be effectively implemented in different practice settings.

Aim Statement

The aim of this QI project was to increase and standardize PPD screening using the EPDS during the 1-month, 2-month, 4-month, and 6-month WCCs in two outpatient pediatric clinics–Clinic A and Clinic B–where screening rates at the outset of the project were 57% and 44%, respectively, and highly variable by provider. Over a 3-month period (March through May 2019), the aim was to achieve an 85% screening rate at both sites.

Setting and Sample

Clinics A and B are outpatient private practices affiliated with a shared healthcare network. Both clinics serve a diverse populations living in their surrounding counties. Clinic A is a general

pediatrics practice in Durham, NC with five pediatricians who collectively see 100 pediatric patients per day, five days per week. Clinic B is a pediatrics and internal medicine practice in Chapel Hill, NC, with twelve dual-trained medicine/pediatrics physicians, who collectively see approximately 40 pediatric patients and 140 adult patients per day. Over the 3-month study period, an average of 110 and 43 mothers were eligible for PPD screening per month at Clinic A and Clinic B, respectively.

Process Mapping

Both sites conducted thorough process mapping to understand the existing clinic screening practices with the aim of identifying gaps to target for improvement. The process map was continuously updated throughout the study period as new gaps were identified. An example of a process map from Clinic A is shown in Figure 1.

Process mapping revealed key gaps, such as when a father/other caregiver brings the child in for the visit instead of the mother, when front desk staff misses an opportunity to distribute a screening form at check in, when the mother leaves the EPDS tool blank either by mistake or because she declines screening, or when the physician forgets to populate the electronic medical record (EMR) flowsheet with responses from the paper form, among others. Clinic B identified additional challenges including participation of medical residents-in-training who were only in the clinic one day a week and reluctance to adopt clinic-wide standardized processes due to preference for provider-nurse pairs to determine their own workflow.

Interventions

Each site used iterative Plan-Do-Study-Act (PDSA) cycles to improve the use of the EPDS within each clinic's context.

PDSA interventions at Clinic A started with a presentation to the practice's physicians to describe the aims of the project. The presentation sought to gain support from those who would be administering the screening tool and brainstorm gaps and corresponding solutions that could be identified at the outset. The second PDSA built on an idea developed at Clinic B. Language was added into each physician's WCC note templates - "EPDS results entered into flowsheet?" - and an associated hard-stop response - "yes/no" - that required the physician to attest to before signing their note. A third intervention was aimed at creating a sustainable way to remind the front desk who should receive a form. The EMR allows physicians to create "quick buttons" that can be selected at the end of a visit to auto populate the reason for the next visit. Whatever button was selected would show up in the front desk's system at the next visit. By adding the phrase "EPDS needed" to the quick buttons for the 1-, 2-, 4-, and 6-month WCCs, a reminder would automatically populate without any extra steps required. For example, instead of "4-month WCC," the button, and the corresponding front-desk reminder, would read "4-month WCC-EPDS needed."

Clinic B similarly started by gathering stakeholder opinions on the best way to improve screening rates. The clinic had provider-nurse pairs who had already developed their own screening systems (for the PHQ-9/GAD-7 screenings, for example), thus each pair developed their own best workflow. Generally, the nurse was responsible for distributing the EPDS to the parent while collecting vital signs. The physician would then enter the responses into the EMR during or after the visit. For the first PDSA intervention, a designated person in the clinic added a reminder about the EPDS in the "notes" field of each screening-eligible appointment. Next, the Clinic B Medical Director dedicated time at the monthly provider meeting to brainstorm ways to remember to populate the EMR flowsheet; a reminder was entered in the WCC note templates, as described above. Third, project leaders met individually with

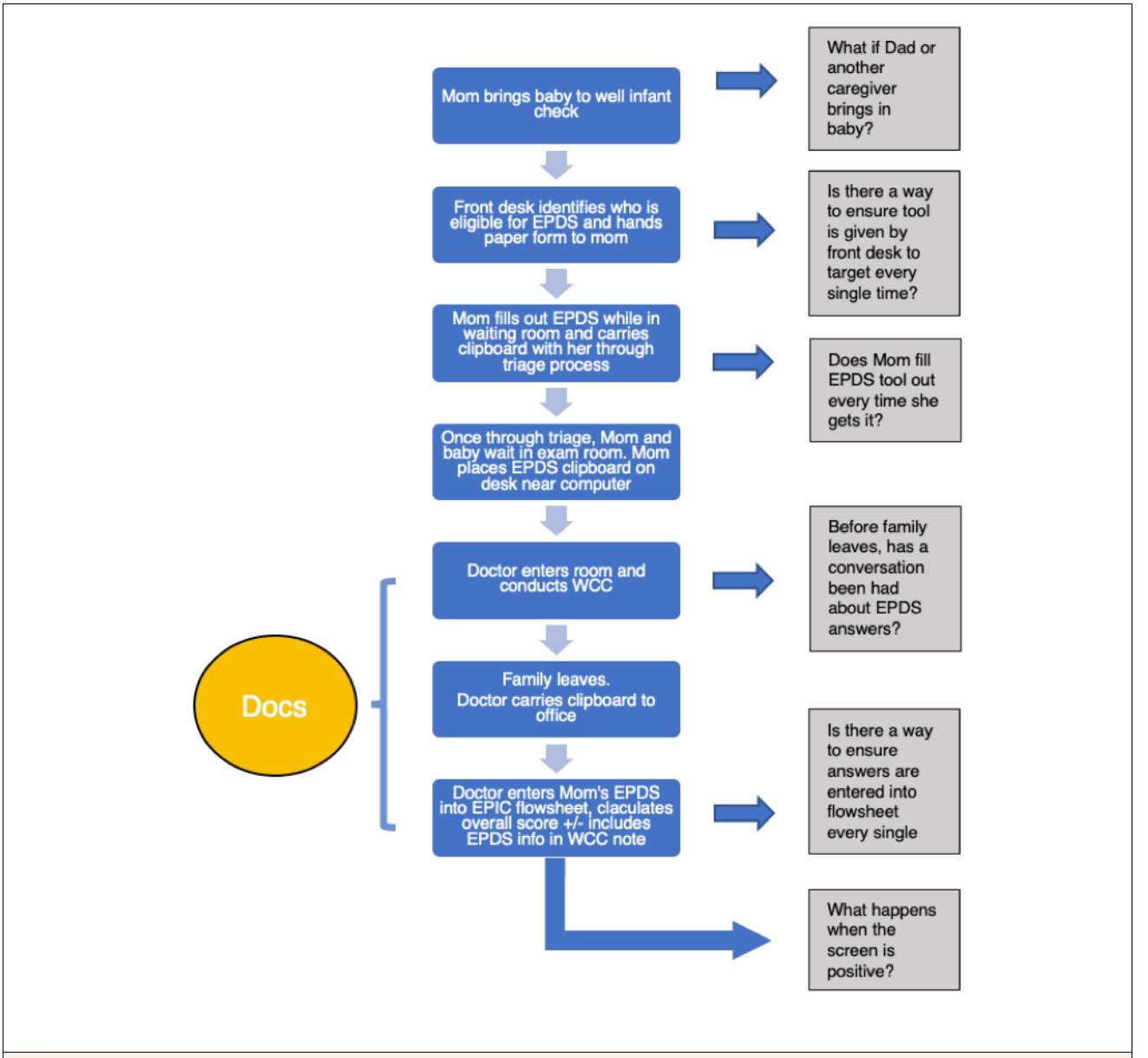

Figure 1. Example process map implemented in Clinic A, identifying current screening process, relevant players, and gaps.

specific providers who continued to have low screening rates to identify concerns (e.g. the desire to use clinical intuition rather than a paper questionnaire) and corresponding solutions. Finally, a process adjustment was implemented which shifted the responsibilities of the players involved; instead of nurses handing out EPDS forms while bringing the family to a room, the front desk would hand out the EPDS questionnaire. The nurses would record the responses in the EMR flowsheet along with vital signs and the physicians would serve as a double check.

Data Collection

EPDS sheets were filled out on paper by the mother during the WCC visit. Results were entered into a flow sheet in the EMR by a nurse or physician. Data reports were pulled from the EMR weekly for each clinic.

Outcome Measure

The primary outcome measure was the aggregate clinic screening rate, defined as the number of mothers screened during their child's visit divided by the number of mothers eligible for screening. The denominator included any visit that was billed as a 1-, 2-, 4-, or 6-month WCC, since those represent potential screening opportunities. The absolute number and percentage of positive tests were also tracked as secondary endpoints.

Ethical Approval

This work was exempted from Institutional Review Board (IRB) approval as per the policies of the UNC IRB. All interventions and analysis were conducted in compliance with relevant human subject research policies and protocols.

Results

Each clinic created a run chart indicating when PDSA interventions were implemented along a curve of weekly screening rates over the 3-month study period (Figures 2 and 3).

The run chart from Clinic A demonstrates three data points below the baseline median; ten data points above baseline median; four total runs (three to ten runs were expected); one shift; and no trends. The run chart from Clinic B shows two data points below the baseline median and eleven points above; five total runs (four to eleven runs were expected); one shift; and no trends. Thus, both run charts at the respective clinic sites demonstrate evidence of clinically significant process improvement.

The overall screening rate at Clinic A rose from 57% in early March 2019 to 90% at the end of May 2019. The Clinic B screening rate rose from 44% to 89% over the same period. In addition, using an EPDS cutoff score of 10, the number of women screening positive increased, indicating identification of patients with possible PPD that may otherwise not have come to provider attention. Neither Clinic A or B reported positive screens in February 2019, prior to this QI project. Yet, Clinic A identified one, six, and four positive screening results over March, April, and May, respectively; these results correspond to screening positivity rates of 1%, 5%, and 4%, respectively. Across March, April, and May, Clinic B identified one, three, and four total positive screens, corresponding to screening positivity rates 5%, 11%, and 13%, respectively.

Discussion and Next Steps

The process improvement demonstrated by our data and with the rise in screening rates at both clinics indicate the interventions were effective at increasing screening rates toward the set goal of 85%. While the rise in the total number and percent of positive screens at both clinics suggest success in screening, only Clinic B's screening positivity rate approached the reported 10-15% rate of PPD in the general population.[11] As such, it is likely multiple cases of PPD may have been missed if not for universal screening, but other cases remained unidentified by our screening processes, particularly at Clinic A. The lack of a control group and small sample size limit the ability to make robust statistical conclusions from the data.

Process mapping revealed additional aspects of PPD screening worth addressing. First, while most PPD screening focuses on mothers, approximately 10% of fathers experience depression in the postnatal period compared to 4.9% in the general population.[22,23] Depression in new fathers is also associated with adverse child health outcomes related to parenting practices (less reading, more corporal punishment), internalizing behaviors (anxiety), externalizing behaviors (misbehavior, lower school performance), and the family envi-

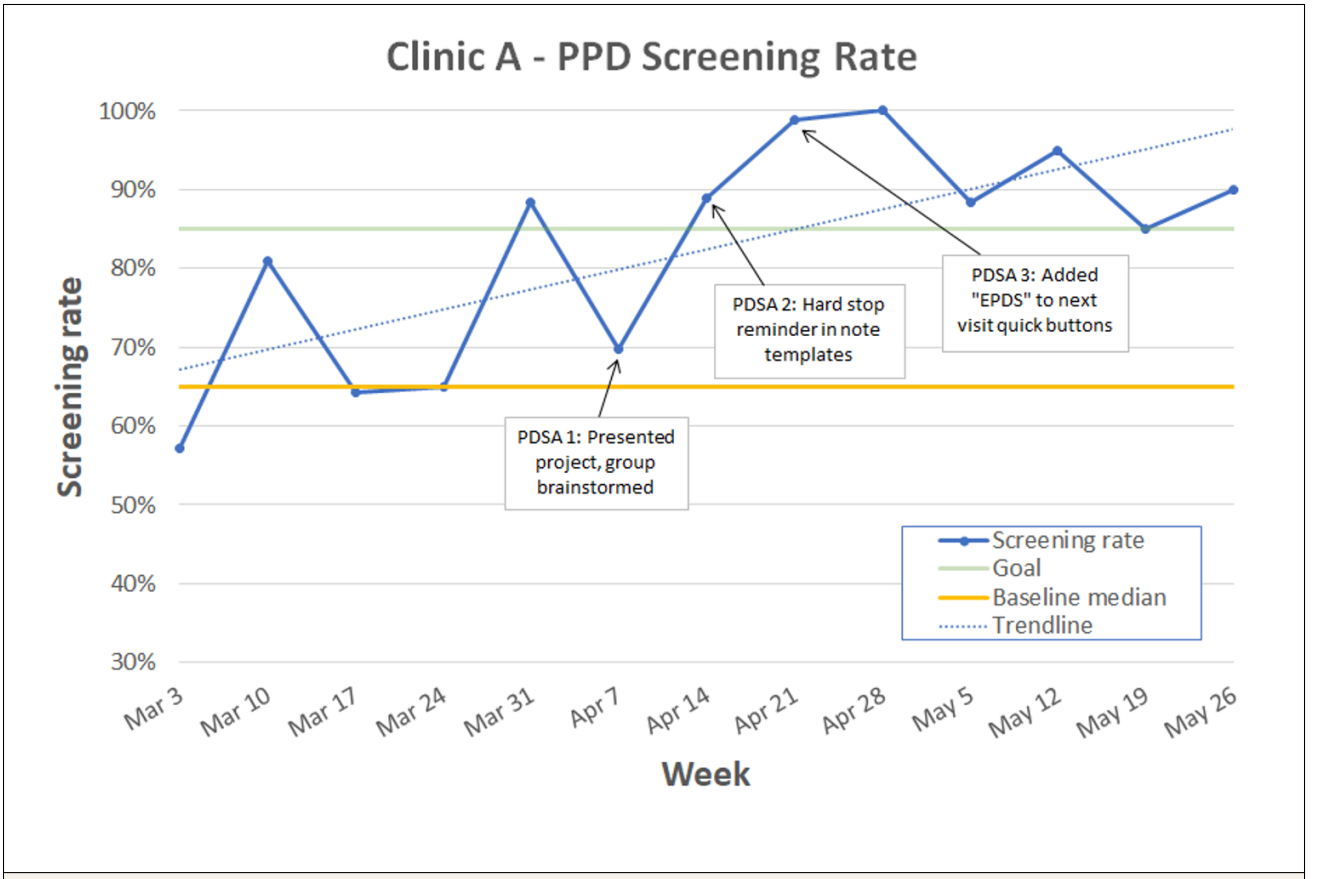

Figure 2. Run chart from Clinic A demonstrating three PDSA cycles and an increasing screening rate across sequential cycles.

ronment (interparental conflict).[24] Fathers who brought their infants into both clinics in our study were not screened with the EPDS. However, the EPDS has been validated in fathers in multiple studies, and thus, screening fathers could be an important next step.[25–29] Proxy screening via the EPDS-P (the partner version) could be an adjunct tool to broaden screening, allowing the mother to report on behalf of the father and vice versa.[30]

Second, a challenging aspect of screening parents for PPD in the pediatric setting was appropriately acting on a positive result. At Clinic B, many mothers being screened were themselves patients of the clinic, and all the providers at the clinic saw adults as well as children. However, at the pediatrics-only Clinic A, providers experienced some discomfort when the need to act on a mother's positive screen blurred the line between the mothers role as patient parent and patient; further complicated by questions over the appropriateness of treating an adult patient at a pediatrics practice. Overall, this indirectly and negatively influenced the desire to screen.

While technically beyond the scope of this QI project, the imperative to act on a positive screen and the absence of a standardized system to do so at either site necessitated the development of two intermediate solutions. The first was the creation of a robust community resource and referral set that could be shared with the mothers at both sites while reviewing the EPDS results. This set included hotlines, contact information for mental health professionals, local peer support groups, and patient literature on PPD. Additionally, Clinic A was already in the process of hiring a social worker, and a recommendation was made to

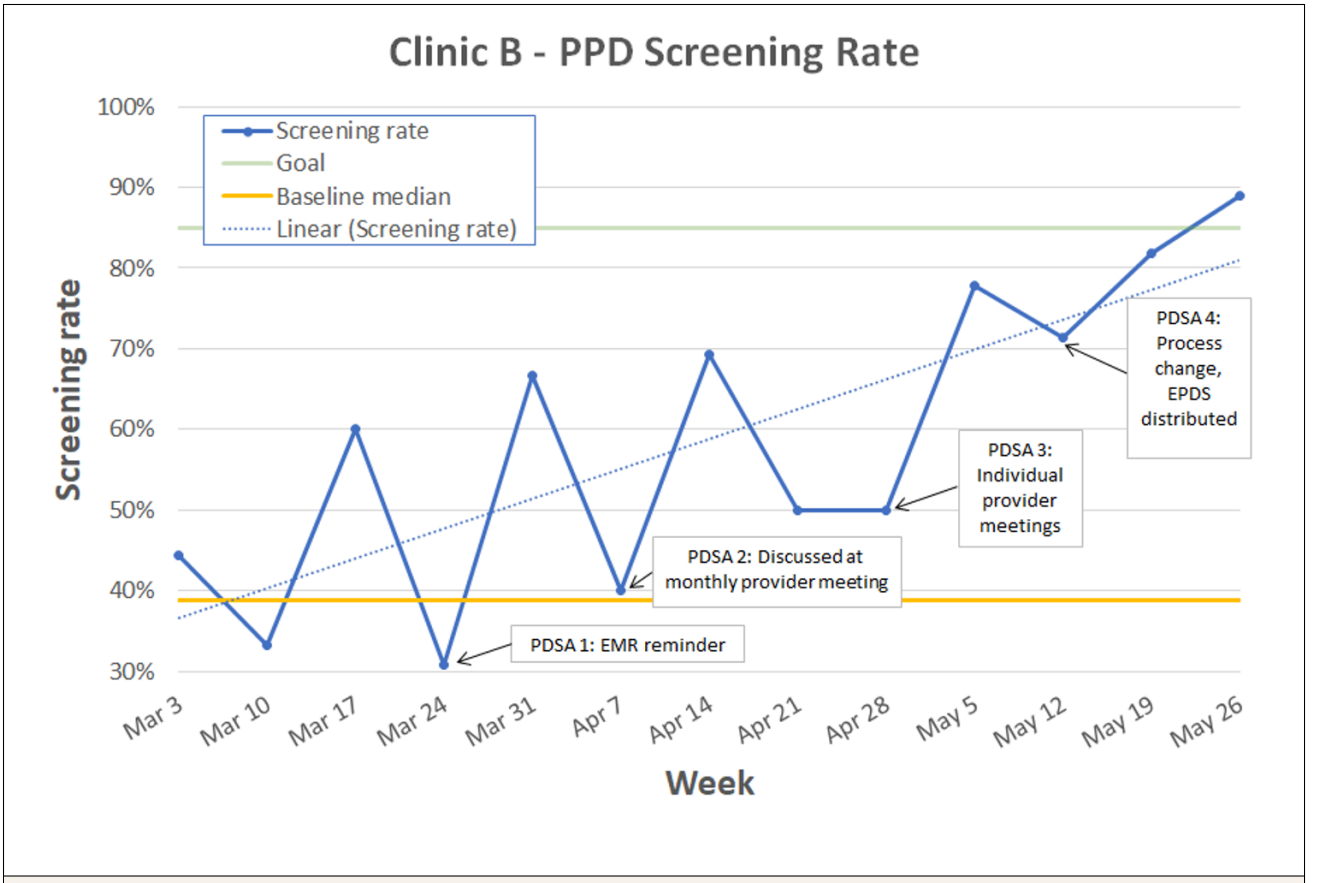

Figure 3. Run chart from Clinic B demonstrating four PDSA cycles and an increasing screening rate across sequential cycles.

expand the social worker's role to include bridging mothers with positive screens to appropriate care. A next step would be to collocate maternal mental healthcare within the pediatric medical home, important for removing both tangible (transportation, childcare) and intangible (stigma, lack of knowledge about available services) barriers to mental healthcare.[31] While data continues to emerge on this broader movement, pilot studies of this type of model—and especially models that care for the mother-infant dyad in tandem—demonstrate improved maternal and child health outcomes.[31]

Finally, two key questions inherent to all QI initiatives are the generalizability of findings and how to sustain the change. As part of a shared health network, Clinic A and B participate in the UNC Primary Care Improvement Collaborative (PCIC). Upon completion of this project, the results were presented at the PCIC monthly meeting to share the PPD resource set and to collectively brainstorm additional interventions that could be implemented in other clinic contexts.

Conclusion

Implementing simultaneous quality improvement processes at two clinics provided a useful design for increasing customization and variety in the types of interventions tested. Shared learnings between the sites and within the broader healthcare network expedited progress toward effective implementation. Increasing PPD screening rates in the pediatric setting is feasible and can lead to identification of mothers in need of further

evaluation who might not otherwise have been brought to provider attention. Future directions include screening of partners/other caregivers in a child's life and solidifying a reliable pathway from a positive screen to diagnostics and treatment.

Limitations

This project was subject to limitations. The data likely underestimated the number of mothers actually screened since the data points were a reflection of manual input by physicians into the EMR flowsheet. Second, the relative infrequency of pediatric visits at Clinic B made it difficult to assess sustained changes in the screening rate. Third, the flowsheet lacked a place to indicate that screening was attempted but declined by the mother or that the EPDS tool was filled out by a father or another caregiver. Finally, a limitation inherent to the PDSA model of QI is that the effectiveness of a single intervention cannot be definitively known in the absence of a control group.

ARTICLE INFORMATION

Accepted for Publication: May 05 2021.
Published Online: September 28 2021.
DOI: 10.47265/cjim.v1i1.539

Cite this article: Stone Juliana, Allen Lauren. Increasing Postpartum Depression Screening in the Pediatric Setting. Carolina Journal of Interdisciplinary Medicine (CJIM) 2021;1(1):43-51.

Conflict of Interest Disclosures: None.

Acknowledgments: We would like to thank our clinical preceptors at both sites: Dr. Alison Kavanaugh from UNC Pediatrics at Southpoint and Dr. Kimberly Kylstra from North Chatham Pediatrics and Internal Medicine. We also thank Dr. Amy Shaheen from UNC School of Medicine for supporting our work.

Funding/Support: None.

Previous Presentation: This work was presented at the 2019 Community Based Longitudinal Care Quality Improvement Symposium, the 2019 UNC Primary Care Improvement Collaborative monthly meeting, and the 2019 UNC Quality Expo.

Ethics Approval: Exempt, see Methods.

AUTHOR BIOGRAPHY

Juliana Stone is a PGY-1 training in pediatric medicine at the Stanford School of Medicine.

Lauren Allen is a PGY-1 training in pediatric medicine at the Duke University School of Medicine.

REFERENCES

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (DSM-5®). American Psychiatric Pub ; 2013,. .

2. Slomian J, Honvo G, Emonts P, et al. Consequences of maternal postpartum depression: A systematic review of maternal and infant outcomes. *Womens Health*. 2019;15:1745506519844044–1745506519844044.

3. Field T. Postpartum depression effects on early interactions, parenting, and safety practices: a review. *Infant Behav Dev*. 2010;33:1–6.

4. Felitti VJ. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *Am J Prev Med*. 1998;14:245–258.

5. O'Leary N, et al. Antenatal depression and the impact on infant cognitive, language and motor development at six and twelve months postpartum. *Early Hum Dev*. 2019;134:41–46.

6. Brummelte S, Galea LA. Postpartum depression: Etiology, treatment and consequences for maternal care. *Horm Behav*. 2016;77:153–166.

7. Pilowsky DJ. Children of depressed mothers 1 year after the initiation of maternal treatment: findings from the STAR*D-Child Study. *Am J Psychiatry*. 2008;165:1136–1147.

8. Foster CE. Remission of maternal depression: relations to family functioning and youth internalizing and externalizing symptoms. *J Clin Child Adolesc Psychol*. 2008;37:714–724.

9. Weissman MM. Treatment of Maternal Depression in a Medication Clinical Trial and Its Effect on Children. *American Journal of Psychiatry*. 2015;172:450–459.

10. Mangla K, Hoffman MC, Trumpff C, et al. Maternal self-harm deaths: an unrecognized and preventable outcome. *Am J Obstet Gynecol*. 2019;221:295–303.

11. Gavin NI. Perinatal depression: a systematic review of prevalence and incidence. *Obstet Gynecol*. 2005;106:1071–1083.

12. Cox EQ, Sowa NA, Meltzer-Brody SE, et al. The Perinatal

Depression Treatment Cascade. *The Journal of Clinical Psychiatry*. 2016;77:1189–1200.

13. Heterogeneity of postpartum depression: a latent class analysis. *The Lancet Psychiatry*. 2015;2:59–67.

14. Putnam KT. Clinical phenotypes of perinatal depression and time of symptom onset: analysis of data from an international consortium. *The Lancet Psychiatry*. 2017;4:477–485.

15. Siu AL. Screening for Depression in Adults: US Preventive Services Task Force Recommendation Statement. *JAMA*. 2016;315:380–387.

16. Evins GG, Theofrastous JP, Galvin SL. Postpartum depression: a comparison of screening and routine clinical evaluation. *Am J Obstet Gynecol*. 2000;182:1080–1082.

17. Chaudron LH, Szilagyi PG, Kitzman HJ, et al. Detection of postpartum depressive symptoms by screening at well-child visits. *Pediatrics*. 2004;113:551–558.

18. Fergerson SS, Jamieson DJ, Lindsay M. Diagnosing postpartum depression: can we do better? *Am J Obstet Gynecol*. 2002;186:899–902.

19. Earls MF. The Committee on Psychosocial Aspects of Child and Family Health. Incorporating Recognition and Management of Perinatal and Postpartum Depression Into Pediatric Practice. *PEDIATRICS*. 2010;126:1032–1039.

20. Kerker BD. Identifying Maternal Depression in Pediatric Primary Care. *Journal of Developmental & Behavioral Pediatrics*. 2016;37:113–120.

21. Cox J. Thirty years with the Edinburgh Postnatal Depression Scale: voices from the past and recommendations for the future. *Br J Psychiatry*. 2019;214:127–129.

22. Cameron EE, Sedov ID, Tomfohr-Madsen LM. Prevalence of paternal depression in pregnancy and the postpartum: An updated meta-analysis. *J Affect Disord*. 2016;206:189–203.

23. Paulson JF, Bazemore SD. Prenatal and postpartum depression in fathers and its association with maternal depression: a meta-analysis. *JAMA*. 2010;303:1961–1969.

24. Fisher SD, Garfield C. Opportunities to Detect and Manage Perinatal Depression in Men. *Am Fam Physician*. 2016;93:824–825.

25. Edmondson OJH, Psychogiou L, Vlachos H, et al. Depression in fathers in the postnatal period: assessment of the Edinburgh Postnatal Depression Scale as a screening measure. *J Affect Disord*. 2010;125:365–368.

26. Lai BPY, Tang AKL, Lee DTS, et al. Detecting postnatal depression in Chinese men: a comparison of three instruments. *Psychiatry Res*. 2010;180:80–85.

27. Loscalzo Y, Giannini M, Contena B, et al. The Edinburgh Postnatal Depression Scale for Fathers: A contribution to the validation for an Italian sample. *Gen Hosp Psychiatry*. 2015;37:251–256.

28. Matthey S, Barnett B, Kavanagh DJ, et al. Validation of the Edinburgh Postnatal Depression Scale for men, and comparison of item endorsement with their partners. *J Affect Disord*. 2001;64:175–184.

29. Massoudi P, Hwang CP, Wickberg B. How well does the Edinburgh Postnatal Depression Scale identify depression and anxiety in fathers? A validation study in a population based Swedish sample. *J Affect Disord*. 2013;149:67–74.

30. Fisher SD, Kopelman R, O'hara MW. Partner report of paternal depression using the Edinburgh Postnatal Depression Scale-Partner. *Arch Womens Ment Health*. 2012;15:283–288.

31. Kimmel MC. Integrating Maternal Mental Health Care in the Pediatric Medical Home: Treatment Engagement and Child Outcomes. *Clin Pediatr*. 2017;56:1148–1156.