Published in final edited form as:

J Psychosom Obstet Gynaecol. 2018 December ; 39(4): 297–306. doi:10.1080/0167482X.2017.1383380.

PRogram In Support of Moms (PRISM): a pilot group randomized controlled trial of two approaches to improving depression among perinatal women

Nancy Byatt^a, Tiffany A. Moore Simas^a, Kathleen Biebel^a, Padma Sankaran^a, Lori Pbert^a, Linda Weinreb^a, Douglas Ziedonis^b, and Jeroan Allison^a

^aUniversity of Massachusetts Medical School and UMass Memorial Health Care, Worcester, MA, USA

^bDepartment of Psychiatry, University of California, San Diego, CA, USA

Abstract

Purpose—This pilot study was designed to inform a larger effectiveness trial by: (1) assessing the feasibility of the PRogram In Support of Moms (PRISM) and our study procedures; and, (2) determining the extent to which PRISM as compared to an active comparison group, the Massachusetts Child Access Psychiatry Program (MCPAP) for Moms alone, improves depression among perinatal women.

Methods—Four practices were randomized to either PRISM or MCPAP for Moms alone, a statewide telephonic perinatal psychiatry program. PRISM includes MCPAP for Moms plus implementation assistance with local champions, training, and implementation of office prompts and procedures to enhance depression screening, assessment and treatment. Patients with Edinburgh Postnatal Depression Scales (EPDS) ≥ 10 were recruited during pregnancy, and completed the EPDS and a structured interview at baseline and 3-12 weeks' postpartum.

Results—Among MCPAP for Moms alone practices, patients' ($n = 9$) EPDS scores improved from 15.22 to 10.11 ($p = 0.010$), whereas in PRISM practices patients' ($n = 21$) EPDS scores improved from 13.57 to 6.19 ($p = 0.001$); the between groups difference-of-differences was 2.27 ($p = 0.341$).

CONTACT Nancy Byatt nancy.byatt@umassmemorial.org University of Massachusetts Medical School and UMass Memorial Health Care, 55 Lake, Ave North, Worcester, MA 01655, USA.

Disclosure statement

The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

This work was presented as an oral presentation at the Academy of Psychosomatic Medicine Annual Meeting in Austin, TX November 11, 2016 and at the International Marcé Society for Perinatal Mental Health in Melbourne, Australia on September 25, 2016.

The first, second, third and sixth author have received salary and/or funding support from Massachusetts Department of Mental Health via the Massachusetts Child Psychiatry Access Program for Moms (MCPAP for Moms). The first author is also the statewide Medical Director of MCPAP for Moms. The first author serves on the American College of Ob/Gyn Maternal Mental Health Expert Work Group, the Perinatal Depression Advisory Board for the Janssen Disease Interception Accelerator Program, the Physician Advisory Board for Sage Therapeutics, and is a Council Member of the Gerson Lehrman Group. The second author is the Lead Obstetric Liaison for MCPAP for Moms and serves on the Physician Advisory Board for Sage Therapeutics, is Co-Chair of the American College of Ob/Gyn Maternal Mental Health

Expert Work Group, and serves on the Council on Pt Safety in Women's Health, Perinatal Mood and Anxiety Disorder Pt Safety Bundle. The third author has been the Program Director of MCPAP for Moms, and the sixth author has served as a Consultant for MCPAP for Moms. The fourth, fifth, seventh and eighth authors do not have any disclosures.

Conclusions—PRISM was beneficial for patients, clinicians, and support staff. Both PRISM and MCPAP for Moms alone improve depression symptom severity and the percentage of women with an EPDS >10. The improvement difference between groups was not statistically significant due to limited power associated with small sample size.

Keywords

Maternal depression; obstetrics; perinatal mental health; post-natal depression; mental health

Introduction

Perinatal depression (Major Depressive Disorder in pregnancy or within one year postpartum) is common and complicates maternal [1,2], birth [3], infant [4] and child outcomes [5–7]. Given that upwards of 1 in 7 [8,9] women suffer from perinatal depression [10,11], it is increasingly recognized as a major public health problem. Perinatal depression screening alone does not translate into treatment participation because patient, program and system level barriers exist [12–14]. Obstetric providers often find screening a futile exercise without proper training and access to mental health resources [12–15]. Less than 30% of women who screen positive for depression attend a mental health visit [16–20] and less than 10% [16,20] participate in a full treatment course.

Collaborative care models, which integrate depression treatment into primary care settings and improve quality of mental health care and depression outcomes [21], have recently been evaluated in obstetric settings [22–28]. Despite treatment success, collaborative care models are resource intensive and depend on care managers that are not reliably reimbursed by third party payors. Therefore, their broad implementation, dissemination and associated treatment improvement are often not realized [29,30].

Using strategies informed by implementation science [31–36], we designed the PRogram In Support of Moms (PRISM) to leverage existing obstetric providers and staff and our statewide Massachusetts Child Psychiatry Access Program (MCPAP) for Moms program, rather than relying only on care managers as in collaborative care models, to help obstetric practices recognize, assess and treat depression in an efficient and sustainable manner. MCPAP for Moms provides all Massachusetts obstetric practices with access to mental health resources and psychiatric telephone consultation [37]. While MCPAP for Moms utilization data supports it as a low-cost valued resource, emerging data suggest additional intervention components are needed to ensure that women do not fall through cracks in the depression care pathway [19]. For example, because it is a statewide program, MCPAP for Moms does not provide step-by-step implementation assistance, training and change management support to help individual obstetric practices implement comprehensive depression care. To address these limitations, we developed the PRogram In Support of Moms (PRISM) using iterative feedback from obstetric practices [38]. PRISM is a proactive, multifaceted, and practical intervention that builds on MCPAP for Moms to provide more intensive implementation support and follow-up to help obstetric practices implement and sustain depression detection, assessment, treatment and follow-up.

This pilot study aimed to prepare for a larger effectiveness trial by: 1) implementing and obtaining further feedback on PRISM and MCPAP for Moms to improve both interventions and the study design; and, 2) comparing provider self-perceptions of ability to treat depressed perinatal patients and affected women's depression symptom severity in PRISM versus MCPAP for Moms alone practices.

Methods

We conducted a group randomized trial with 1:1 allocation of obstetric practices to participate in either PRISM or MCPAP for Moms alone. Groups were assigned at the practice level due to: (1) practices being the natural intervention unit; (2) lack of feasibility of assigning by patient; and, (3) risk of contamination with differentially exposed patients within a practice. Four practices were randomized by simple random-number sequence within strata of practice type (academic vs. community); patients entered the designated study arm based on where they received care. The study was single blinded at the patient level, not at the practice level. The Institutional Review Board approved the study and all procedures performed were in accordance with the ethical standards of the Board. The [ClinicalTrials.gov](https://clinicaltrials.gov) registry number is NCT02935504.

Study setting and population

Practices were recruited through direct contact at faculty/staff meetings, informational sessions and email. Practices were recruited in March 2014 (pre-implementation) and followed until June 2016 (post-implementation). Within practices, participating providers included obstetric physicians, advanced practice nurses and certified nurse midwives; participating staff included nurses, patient care assistants or administrative support staff. PRISM randomized practices included an academic general obstetric practice (~12 providers, ~1100 deliveries/year), and a community general obstetric practice (~6 providers, ~450 deliveries/year). MCPAP for Moms alone randomized practices included an academic maternal-fetal medicine practice (~5 providers, ~350 deliveries/year), and a private community general obstetric practice (~11 providers, ~875 deliveries/year). All practices were in the same city and performed deliveries at the same hospital.

As part of the study, each practice administered the Edinburgh Postnatal Depression Scale (EPDS) [39] to each patient at least once during pregnancy. During screening, patients were given opportunity to opt out of contact by the Research Coordinator (Figure 1). Patients that did not opt out and were deemed eligible were contacted and invited to an in-person meeting in which written informed consent was obtained. Eligible women scored ≥ 10 on the EPDS and were 18–55 years old, English-speaking and pregnant. Based on the Mini-International Neuropsychiatric Interview (M.I.N.I.) [40], women with active substance use disorder(s), bipolar disorder or a psychotic component to their illness were excluded. Patients were recruited and followed between August 2014 and January 2016. Patients received \$15 for the initial assessment and \$25 for the final assessment.

Study groups

MCPAP for Moms alone (active comparison group)—MCPAP for Moms alone included training and toolkits, provider access to perinatal psychiatrists via telephone and face-face consultation, and community-based mental health resources and referrals (details are described elsewhere) [41]. MCPAP for Moms, funded by the Massachusetts Department of Mental Health, is a statewide program. Because all Massachusetts obstetric providers have access to MCPAP for Moms, including access to MCPAP for Moms in the PRISM group was essential to maintain ethical standards. Access to MCPAP for Moms alone was considered an active comparison [41] because practices in other states generally do not have ready access to this level of support [42].

PRogram In Support of Moms (PRISM)—PRISM included MCPAP for Moms plus additional training, implementation support and toolkits augmented by step-by-step technical assistance, and change management support to help practices implement PRISM components (Table 1). Implementation strategies were adapted from the 10 step model of Addressing Problems Through Organizational Change (APTOC), which has been effective in helping agencies and programs change culture to address tobacco and other issues (Table 2) [43,44].

PRISM is a multi-pronged intervention that targets systems rather than individuals [35,36,45]. Because health care organizations are complex evolving systems [31–35,46,47], in which one-size-fits-none, our implementation was designed to empower and support practices in developing their own approaches for addressing perinatal depression, while maintaining core common components across all practices [48]. Using participatory action techniques [49–51], we partnered with practice leaders and staff to collaboratively address issues in each specific system or practice, and to customize PRISM components to their environment through an iterative process.

Data collection and measures

Procedures for obstetric practices—Providers and staff completed a questionnaire at baseline (pre-implementation) and post-implementation (6–24 months after the initial implementation). The questionnaire assessed behaviors, attitudes and perceptions towards perinatal depression detection, assessment and treatment. To identify barriers and facilitators to implementation, we conducted three 60-min audio-taped focus groups guided by a set of open-ended study probes, with a purposeful sample of obstetric providers and staff from the two PRISM practices at post-implementation.

Procedures for patients—Recruited patients completed assessments at 0–20 weeks' gestational age and/or 21–40 weeks' gestational age, and again at 3–12 weeks' postpartum. Patient participants that were recruited before 20 weeks' gestational age gestation participated in three assessments (0–20 weeks, 21–40 weeks' gestational age and 3–12 weeks' gestational age postpartum) and those recruited at 21–40 weeks' gestational age participated in two assessments (0–20 weeks' gestational age and 3–12 weeks postpartum). The baseline assessment for both groups was based on the EPDS collected by the practice.

The EPDS [39] is a validated, self-administered 10-item screening questionnaire. Total EPDS scores range from 0 to 30 with higher scores reflecting greater symptom severity [39].

Demographic information, including age, gestational age or weeks postpartum, race/ethnicity, health insurance and factors associated with mental health treatment participation were obtained through structured interviews. To identify barriers and facilitators to PRISM, 45-min in-depth interviews were conducted with a subsample of patients ($n = 10$) from the PRISM group and audio-taped.

Data analysis

Univariate statistics for all variables were examined followed by bivariate comparisons with statistical significance ascertained with the Fischer exact test due to small cell counts. Over-time changes in depression symptomatology were examined by generalized linear models that parameterized a group coefficient, a time coefficient and a coefficient for the group-time interaction, that accounted for nesting of patients within clinics as a random effect and taking a link function appropriate for continuous or dichotomous outcomes.

Qualitative data from focus groups and patient interviews were content analyzed using an iterative, interpretive process within a grounded theory framework. A constant comparative method was used to continuously revise and clarify codes, as themes and patterns emerged [52]. Codes were added until no new themes emerged; initial sections were categorized using reformulated codes. Each transcript was coded by two researchers, who achieved 90% agreement rate in independent coding.

Results

Obstetric providers and staff

Seventy-one providers and staff consented to participate and completed the baseline survey (32 providers and 39 staff). In the MCPAP for Moms group ($n = 33$), there were 15 providers (13 physicians, 1 nurse mid-wives and 1 nurse practitioners) and 18 staff (3 nurses, 3 nursing assistants and 12 administrative support staff). In the PRISM group ($n = 38$), there were 17 providers (15 physicians, 1 nurse midwives and 1 nurse practitioners) and 21 staff (5 nurses, 5 nursing assistants and 11 administrative support staff). The post-survey was completed by 65% ($n = 46$) overall (75% ($n = 24$) providers and 62% ($n = 22$) staff).

The percentage of providers certain in their ability to effectively treat obstetric patients with depression increased over time for both study groups, however, the increase was greater in PRISM (9.1%, 53.3%, $p = 0.006$) versus MCPAP for Moms alone (0.0%, 33.3%, $p = 0.074$) practices. The percentage of support staff who reported having knowledge and skills to detect and address depression increased significantly over time, again with the improvement being greater for PRISM practices (35.3%, 88.9%, $p = 0.014$) versus for MCPAP for Moms alone (33.3%, 80.0%, $p = 0.027$).

Following study completion, 11 providers and 23 staff from the PRISM practices participated in focus groups. Focus groups identified barriers and facilitators to implementing PRISM, and to addressing perinatal depression in obstetric settings. Barriers

included: (1) some women not being receptive to treatment; (2) time required to address perinatal depression; (3) need for more knowledge and comfort for responding to a positive depression screen and identifying false positive screens; and, (4) provider concerns about liability of starting psychotropic medications for patients who will transition out of care after 6 weeks postpartum. With regards to patient receptiveness to treatment, one provider noted:

Most of my patients when I present them with option 1 [resources] say that they're so beside themselves that they won't, they cannot see themselves taking the step to call those different resources to take that next step. They're too overwhelmed, they can't do it.

Identified facilitators to implementing PRISM included: (1) the screening process itself reinforced the need to universally screen; (2) the EPDS acts as a depression conversation starting tool; (3) improved knowledge and skills among providers and staff due to perinatal depression trainings, particularly on prevalence, impact, and medication management; (4) linkage with community mental health resources provided through MCPAP for Moms; and (5) patients being more receptive to discussing depression and getting treatment. As one provider participant commented:

... it's always been hard to know how to deal with patients who you feel are depressed or blue. There was no organized way to approach the problem and talk and if you did there was nowhere to refer... it would be... I hate to say, almost kind of threw them under the rug a little bit. This [PRISM] has created such a great avenue to identify them and to get them help so I want to thank you for that.

Patients

Thirty-three patients were eligible and completed the baseline assessment and 31 completed the full study, resulting in a retention rate of 94% (Figure 1). We did not observe any differences in age, ethnicity or EPDS scores between patients who chose to participate and those who did not (Table 3). The population studied represented a diverse sample. There were socio-demo-graphic and baseline gestational age differences between study groups (Table 2). Among both groups, average length of study enrollment was 24.4 weeks; in the PRISM group, the average length was 21.4 weeks as compared to an average of 31.4 weeks in the MCPAP for Moms alone group.

As displayed in Figure 2, there was a statistically significant decline in mean EPDS scores across time for both study groups, with the magnitude of the decline being greater for the PRISM group (7.38; $p < 0.001$) compared to the MCPAP for Moms alone group (5.11; $p = 0.010$). However, the difference-of-differences (2.27) did not reach statistical significance ($p = 0.341$). There was a statistically significant decline in proportion of women meeting the EPDS threshold for probable depression, with the magnitude of the decline being greater for the PRISM versus the MCPAP for Moms alone group (Figure 3). Likewise, the difference-of-differences did not reach statistical significance ($p = 0.431$). At the end of the study, 28.6% versus 44.4% of PRISM versus MCPAP for Moms alone practice patients met or surpassed the EPDS threshold for probable depression.

Among patients receiving care from both MCPAP for Moms alone, and PRISM practices, twenty-nine (97%) agreed or strongly agreed that depression screening results were discussed with them in a supportive way. Similarly, twenty-two (76%) patients reported that during the past three months, there was never a time when they felt they needed help for their emotions or mental health, and did not receive it.

Interviews with patients identified barriers and facilitators to addressing perinatal depression. Barriers included: (1) shame, stigma, and fear of discussing depression; (2) need to better introduce and explain the EPDS; (3) providers mostly ‘suggesting’ help for depression rather than ‘strongly advising’; (4) providers not discussing medication or their risks/benefits; and (5) need for obstetric practices to follow-up and monitor depression. As one patient participant noted:

Maybe if someone had been adamant about seeking treatment along the way, then I wouldn’t have decided against it....

Facilitators to addressing depression included: (1) understanding the high prevalence; (2) depression screening to ‘start the conversation’; (3) trusting relationship with provider for discussing mental health concerns; (4) making depression a routine part of obstetric care made it seem less shameful to get help; and (5) obstetric providers addressing depression allowed patients to get treatment not otherwise considered. As one patient participant noted:

I wasn’t really ready to admit to anyone about my depression and what I was dealing with... I didn’t want to talk about it at first, but they (the obstetric providers) got me to talk and I usually don’t like to talk at all.

Discussion

PRISM was beneficial for patients, clinicians and support staff. Both PRISM and MCPAP for Moms alone improved depression outcomes. The EPDS score change within each patient study group was statistically significant; the difference-of-differences between groups was not significant due to small sample size. Nonetheless, clinically significant findings included that MCPAP for Moms alone improved depression symptom severity while PRISM led to more substantial improvement. We also found reductions in the percent of women with depression suggestive EPDS scores (>10); a finding that is clinically, although not statistically significant. Our findings suggest that if MCPAP for Moms alone and PRISM were implemented and evaluated in a larger scaled trial designed to test effectiveness, and if there were similar benefit magnitudes, a statistically significant differential improvement in depression outcomes in PRISM and MCPAP for Moms alone would be found, with PRISM having greater benefit (Table 3).

The potential for clinical impact of PRISM appears to be related to its high degree of acceptability, the changes in comfort addressing depression amongst obstetric providers, and the between-group differences in proportion of patients with EPDS scores <10. Implementation assistance, provider, nursing and administrative staff involvement, and the organizational change management approach (APTOC) in which PRISM component were tailored to meet unique needs of each practice may be critical components that were not available to MCPAP for Moms alone practices.

Study strengths include our high patient retention rate of 94% and that PRISM can be adapted to different practice settings. Massachusetts has already implemented MCPAP for Moms statewide, which makes our active comparison group feasible [37]. Our study allowed us to test PRISM, while also conducting a naturalistic study of the existing MCPAP for Moms program. Although Massachusetts has implemented MCPAP for Moms, this is the first study of how the program may impact patients' depression severity. The small sample size precluded our ability to statistically adjust for demographic differences, and limited our ability to detect differential improvements in patient depressive symptoms between the two groups. Our study is limited by differences in between groups patient baseline demographics, which may have introduced bias. For example, more patients in the PRISM group had third trimester study enrollment, which allowed less time for intervention exposure and depressive symptom improvement. These differences may have made it less likely that the PRISM group would respond to the intervention and biases our study toward the null. Finally, we were not able to retain all the provider participants, and participating practices were all from one health system and thus had access to our Massachusetts specific program, which limits the generalizability of results. However, practices were from different settings including private, community and academic venues.

Understanding the impact of both PRISM and MCPAP for Moms alone on depression outcomes is essential and requires effectiveness testing. The integration of participatory action research and RCT approaches in our design allowed us to pilot test PRISM and MCPAP for Moms, while also obtaining iterative feedback to improve our interventions and study design. It is possible that PRISM did not offer enough intensity or improvement beyond the MCPAP for Moms intervention. For example, our qualitative data suggest that PRISM needs refinement to proactively engage patients in treatment and follow-up and monitor their depression. Also, the adaptive participation of end-users that were most involved in obstetric care allowed us to be responsive to practice-specific issues, carrying the potential for our implementation approach to be utilized across diverse clinical systems.

Our study suggests that building the capacity of front line obstetric practices to detect, assess and manage depression can improve depression outcomes among women. PRISM appears promising in that it provides a practical solution for obstetric practices that does not require large resources and empowers physicians to treat most patients with depression while providing the security of referral and clinical back up for the more complicated cases. MCPAP for Moms alone also appears promising as a less intensive approach that has the potential to serve a larger number of women.

Acknowledgments

Funding

This work was supported by the National Institutes of Health (NIH), [Grant numbers KL2TR000160, UL1TR00016.

References

1. Lindahl V, Pearson JL, Colpe L. Prevalence of suicidality during pregnancy and the postpartum. *Arch Womens Ment Health*. 2005; 8:77–87. [PubMed: 15883651]

2. Flynn HA, Chermack ST. Prenatal alcohol use: the role of lifetime problems with alcohol, drugs, depression, and violence. *J Stud Alcohol Drugs*. 2008; 69:500–509. [PubMed: 18612565]
3. Grote NK, Bridge JA, Gavin AR, et al. A meta-analysis of depression during pregnancy and the risk of preterm birth, low birth weight, and intrauterine growth restriction. *Arch Gen Psychiatry*. 2010; 67:1012–1024. [PubMed: 20921117]
4. Britton HL, Gronwaldt V, Britton JR. Maternal postpartum behaviors and mother-infant relationship during the first year of life. *J Pediatr*. 2001; 138:905–909. [PubMed: 11391337]
5. Forman DR, O'Hara MW, Stuart S, et al. Effective treatment for postpartum depression is not sufficient to improve the developing mother-child relationship. *Dev Psychopathol*. 2007; 19:585–602. [PubMed: 17459185]
6. Deave T, Heron J, Evans J, et al. The impact of maternal depression in pregnancy on early child development. *BJOG*. 2008; 115:1043–1051. [PubMed: 18651886]
7. Paulson JF, Keefe HA, Leiferman JA. Early parental depression and child language development. *J Child Psychol Psychiatry*. 2009; 50:254–262. [PubMed: 19175819]
8. Gavin NI, Gaynes BN, Lohr KN, et al. Perinatal depression: a systematic review of prevalence and incidence. *Obstet Gynecol*. 2005; 106:1071–1083. [PubMed: 16260528]
9. Dietz PM, Williams SB, Callaghan WM, et al. Clinically identified maternal depression before, during, and after pregnancies ending in live births. *Am J Psychiatry*. 2007; 164:1515–1520. [PubMed: 17898342]
10. Segre LS, O'Hara MW, Arndt S, et al. The prevalence of postpartum depression: the relative significance of three social status indices. *Soc Psychiat Epidemiol*. 2007; 42:316–321.
11. Martinez-Schallmoser L, Telleen S, MacMullen NJ. The effect of social support and acculturation on postpartum depression in Mexican American women. *J Transcult Nurs*. 2003; 14:329–338. [PubMed: 14535154]
12. Byatt N, Simas TA, Lundquist RS, et al. Strategies for improving perinatal depression treatment in North American outpatient obstetric settings. *J Psychosom Obstet Gynaecol*. 2012; 33:143–161. [PubMed: 23194018]
13. Byatt N, Biebel K, Friedman L, et al. Patient's views on depression care in obstetric settings: how do they compare to the views of perinatal health care professionals? *Gen Hosp Psychiatry*. 2013; 35:598–604. [PubMed: 23969144]
14. Byatt N, Biebel K, Lundquist R, et al. Patient, provider and system-level barriers and facilitators to addressing perinatal depression. *J Reprod Infant Psychol*. 2012; 30:436–439.
15. Dennis CL, Chung-Lee L. Postpartum depression help-seeking barriers and maternal treatment preferences: a qualitative systematic review. *Birth*. 2006; 33:323–331. [PubMed: 17150072]
16. Smith MV, Shao L, Howell H, et al. Success of mental health referral among pregnant and postpartum women with psychiatric distress. *Gen Hosp Psychiatry*. 2009; 31:155–162. [PubMed: 19269536]
17. Carter FA, Carter JD, Luty SE, et al. Screening and treatment for depression during pregnancy: a cautionary note. *Aust N Z J Psychiatry*. 2005; 39:255–261. [PubMed: 15777362]
18. Marcus SM, Flynn HA, Blow FC, et al. Depressive symptoms among pregnant women screened in obstetrics settings. *J Womens Health (Larchmt)*. 2003; 12:373–380. [PubMed: 12804344]
19. Byatt N, Levin LL, Ziedonis D, et al. Enhancing participation in depression care in outpatient perinatal care settings: a systematic review. *Obstet Gynecol*. 2015; 126:1048–1058. [PubMed: 26444130]
20. Rowan P, Greisinger A, Brehm B, et al. Outcomes from implementing systematic antepartum depression screening in obstetrics. *Arch Womens Ment Health*. 2012; 15:115–120. [PubMed: 22382279]
21. Woltmann E, Grogan-Kaylor A, Perron B, et al. Comparative effectiveness of collaborative chronic care models for mental health conditions across primary, specialty, and behavioral health care settings: systematic review and meta-analysis. *Am J Psychiatry*. 2012; 169:790–804. [PubMed: 22772364]
22. Melville JL, Reed SD, Russo J, et al. Improving care for depression in obstetrics and gynecology: a randomized controlled trial. *Obstet Gynecol*. 2014; 123:1237–1246. [PubMed: 24807320]

23. Leung SS, Leung C, Lam TH, et al. Outcome of a postnatal depression screening programme using the Edinburgh Postnatal Depression Scale: a randomized controlled trial. *J Public Health (Oxf)*. 2011; 33:292–301. [PubMed: 20884642]
24. LaRocco-Cockburn A, Reed SD, Melville J, et al. Improving depression treatment for women: integrating a collaborative care depression intervention into OB-GYN care. *Contemp Clin Trials*. 2013; 36:362–370. [PubMed: 23939510]
25. Grote NK, Katon WJ, Lohr MJ, et al. Culturally relevant treatment services for perinatal depression in socioeconomically disadvantaged women: the design of the MOMCare study. *Contemp Clin Trials*. 2014; 39:34–49. [PubMed: 25016216]
26. Bhat A, Grote NK, Russo J, et al. Collaborative care for perinatal depression among socioeconomically disadvantaged women: adverse neonatal birth events and treatment response. *Psychiatr Serv*. 2017; 68:17–24. [PubMed: 27691376]
27. Grote NK, Katon WJ, Russo JE, et al. A randomized trial of collaborative care for perinatal depression in socioeconomically disadvantaged women: the impact of comorbid posttraumatic stress disorder. *J Clin Psychiatry*. 2016; 77:1527–1537. [PubMed: 28076671]
28. Grote NK, Katon WJ, Russo JE, et al. Collaborative care for perinatal depression in socioeconomically disadvantaged women: a randomized trial. *Depress Anxiety*. 2015; 32:821–834. [PubMed: 26345179]
29. Bachman J, Pincus HA, Houtsinger JK, et al. Funding mechanisms for depression care management: opportunities and challenges. *Gen Hosp Psychiatry*. 2006; 28:278–288. [PubMed: 16814626]
30. Eisenberg JM, Power EJ. Transforming insurance coverage into quality health care: voltage drops from potential to delivered quality. *JAMA*. 2000; 284:2100–2107. [PubMed: 11042759]
31. Cilliers, P. Complexity and postmodernism: understanding complex systems. New York, NY: Routledge; 1998.
32. McDaniel, RR, Driebe, DJ. Advances in health care management. Vol. 2. Emerald Group Publishing Limited; 2001. Complexity science and health care management; 11–36.
33. Miller W, McDaniel RRJ, Crabtree BF, et al. Practice jazz: understanding variation in family practices using complexity science. *J Fam Pract*. 2001; 50:872–872. [PubMed: 11674890]
34. Plsek PE, Greenhalgh T. Complexity science: the challenge of complexity in health care. *BMJ*. 2001; 323:625. [PubMed: 11557716]
35. Stroebel CK, McDaniel RR, Crabtree BF, et al. How complexity science can inform a reflective process for improvement in primary care practices. *Jt Comm J Qual Patient Saf*. 2005; 31:438–446. [PubMed: 16156191]
36. Weingarten SR, Henning JM, Badamgarav E, et al. Interventions used in disease management programmes for patients with chronic illness which ones work? Meta-analysis of published reports. *BMJ*. 2002; 325:925. [PubMed: 12399340]
37. Byatt N, Biebel K, Moore Simas TA, et al. Improving perinatal depression care: the Massachusetts Child Psychiatry Access Project for Moms. *Gen Hosp Psychiatry*. 2016; 40:12–17. [PubMed: 27079616]
38. Byatt N, Pbert L, Hosein S, et al. PProgram In Support of Moms (PRISM): development and beta testing. *Psychiatr Serv*. 2016; 67:824–826. [PubMed: 27079994]
39. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. *Br J Psychiatry*. 1987; 150:782–786. [PubMed: 3651732]
40. Sheehan DV, Lecrubier Y, Sheehan KH, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry*. 1998; 59(Suppl 20):22–33.
41. Gross D. On the merits of attention-control groups. *Res Nurs Health*. 2005; 28:93–94. [PubMed: 15779061]
42. Delatte R, Cao H, Meltzer-Brody S, et al. Universal screening for postpartum depression: an inquiry into provider attitudes and practice. *Am J Obstet Gynecol*. 2009; 200:e63–e64. [PubMed: 19285644]

43. Ziedonis DM, Zammarelli L, Seward G, et al. Addressing tobacco use through organizational change: a case study of an addiction treatment organization. *J Psychoactive Drugs*. 2007; 39:451–459. [PubMed: 18303702]
44. Ziedonis DM, Guydish J, Williams J, et al. Barriers and solutions to addressing tobacco dependence in addiction treatment programs. *Alcohol Res Health*. 2006; 29:228–235. [PubMed: 17373414]
45. Katon W, Russo J, Von Korff M, et al. Long-term effects of a collaborative care intervention in persistently depressed primary care patients. *J Gen Intern Med*. 2002; 17:741–748. [PubMed: 12390549]
46. Maguire, S, McKelvey, B, Mirabeau, L. , et al. Sage handbook of organization studies. Sage; 2006. 1.5 Complexity science and organization studies; 165–214.
47. Plsek P. Redesigning health care with insights from the science of complex adaptive systems. *Crossing the quality chasm: a new health system for the 21st century*. 2001:309–322.
48. Leykum LK, Pugh JA, Lanham HJ, et al. Implementation research design: integrating participatory action research into randomized controlled trials. *Implement Sci*. 2009; 4:69. [PubMed: 19852784]
49. Viswanathan M, Ammerman A, Eng E, et al. Community-based participatory research: assessing the evidence. Summary. 2004
50. Waterman H, Tillen D, Dickson R, et al. Action research: a systematic review and guidance for assessment. *Health Technol Assess (Winchester, England)*. 2001; 5
51. Whyte WFE. Participatory action research. Thousand Oaks (CA): Sage Publications, Inc; 1991.
52. Lincoln, YS, Guba, EG, editors *Naturalistic Inquiry*. Newbury Park, CA: Sage; 1985.
53. Guydish J, Ziedonis D, Tajima B, et al. Addressing Tobacco Through Organizational Change (ATTOC) in residential addiction treatment settings. *Drug Alcohol Depend*. 2012; 121:30–37. [PubMed: 21906892]

Current knowledge on this subject

- Perinatal depression screening alone does not translate into treatment participation because patient, program, and system level barriers exist.
- The majority of women who screen positive for depression do not initiate treatment and even less participate in a full treatment course.
- Obstetric providers need supports in place to be able to appropriately detect, assess and manage depression.

What this study adds

- Building the capacity of front line obstetric practices to detect, assess, and manage depression can improve depression outcomes among women.
- PRISM appears promising in that it provides a practical solution for obstetric practices that does not require large resources and empowers physicians to treat most patients with depression while providing the security of referral and clinical back up for the more complicated cases.
- MCPAP for Moms alone also appears promising as a less intensive approach that has the potential to serve a larger number of women.

Figure 1.
Patient Participant Consort Diagram.

Figure 2.
Depression scores by study group and time.

Figure 3.
Patients with Edinburgh postnatal depression scales score >10 by study group and time.

Table 1

Characteristics of Intervention and Comparison Group.

Enhanced usual care/MCPAP for Moms	PRISM
Access to MCPAP for Moms which includes:	Access to MCPAP for Moms
<ul style="list-style-type: none"> • 30–60-minute presentation on perinatal depression • Obstetric provider access to telephonic psychiatric consultation with MCPAP for Moms perinatal psychiatrists as needed per patient • Obstetric provider access to one-time face-face evaluations by a MCPAP for Moms perinatal psychiatrist with patients • Access to Provider Toolkit (available at www.mcpapformoms.org) • Community-based mental health resources and referrals to individual therapists and community support groups 	<ul style="list-style-type: none"> ◦ See left column • Tailoring of MCPAP for Moms Toolkit to practice and development of Stepped Care Algorithms • Support clinic specific implementation using the Ten Step Model of Addressing Problems Through Organizational Change as detailed in Table 2 (APTOC) [43,53] • Develop approach to depression screening customized for each practice. • Employ psychoeducation to engage patients who screen positive on the EPDS • Stepped care treatment response to depression screening/ assessment

Table 2

Ten Step Model of Addressing Problems Through Organizational Change (APTOC) [43] Adapted for PRISM.

Step	Goal	Steps	Examples
1.	Engage practice providers, leaders and staff and develop a vision for change.	a) Establish overarching vision for change that aligns with practice leadership. b) Establish support from top practice leaders.	i. Develop relationships with department and/or practice leadership through meetings in which introductions are made, current depression practices are reviewed and a vision of improved depression care is articulated. ii. Identify desired patient outcomes and provider and staff vision for practice.
2.	Identify champions, a work group, and prepare for change.	a) Establish champions and multidisciplinary work group. b) Refine goals and strategies. c) Engage and gain support from stakeholders.	i. Select a nurse or medical assistant and physician as practice champions. ii. The work group should include, in addition to the champions, an administrative support staff, the practice manager and any other stakeholder that the practice determines needs representation. iii. Meet with work group and establish goals related to treatment detection, engagement, treatment and monitoring. iv. Obtain iterative feedback and adapt as needed.
3.	Assess practice readiness for PRISM implementation.	a) Conduct baseline assessment.	i. Assess work flow and screening practices through provider and staff surveys and medical record chart abstraction. ii. Environmental scan to determine the extent which the practice's physical environment (i.e. signage and brochures) includes depression education. iii. Assess strengths, weaknesses and opportunities for implementing and customizing PRISM components.
4.	Create a change plan for implementation of PRISM components.	a) Identify steps to achieve goals. b) Determine approach to staging implementation. c) Determine provider/staff roles in implementing PRISM components.	i. Incorporate strengths and weaknesses when tailoring PRISM implementation ii. Determine work flow including who will screen, when and where screen will be administered and what the response will be. iii. Break work flow tasks into smaller attainable steps. iv. Develop 3–5 month change plan for practice environment, provider and patient goals. v. Review options with champions and work group to determine approach to staging implementation. Include a Plan Do Study Act cycle. vi. Determine who will administer the screen, documents the screen, assess

Step	Goal	Steps	Examples
			patient and offers treatment or referral.
5.	Develop materials to disseminate and a communication plan.	a) Develop and implement communication and feedback plan.	i. Communicate practice specific screening and treatment work flow and communicate new procedures to practice providers and staff. ii. Obtain feedback from providers and staff on new procedures. iii. Ensure regular communication and feedback regarding ongoing changes to procedures.
6.	Provider and staff trainings.	a) Conduct training for all practice providers and staff.	i. Training includes how to: (1) screen for depression; (2) use medical record prompts for screening; (3) assess depression; (4) document depression screening in treatment plan; (d) discuss treatment options; (e) engage women in treatment; and, (f) systematically screen screen for depression using the EPDS.
7.	Implementation dissemination plan and environmental goals.	a) Educate and provide educational materials. b) Implement environmental goals.	i. Provide psychoeducation and educational materials to patients during the initial obstetric visit and follow-up visits. ii. Place brochures and posters about depression in exam and waiting rooms.
8.	Implement PRISM components.	a) Implement universal screening. b) Implement practices procedures.	i. Implement screening twice in pregnancy and once in the postpartum period and medical record prompts for screening. ii. Implement practices procedures for assessment, treatment, and referral. iii. Elicit feedback from clinic staff and providers during implementation. iv. Meet regularly to review successes, challenges and solutions.
9.	Evaluate implementation and provide feedback.	a) Evaluate PRISM implementation on a monthly-basis.	i. Evaluate rates of screening, referral and treatment uptake. ii. Visits to practice to learn firsthand about problems and barriers. iii. Provide feedback to practices based on evaluation.
10.	Support, encourage and sustain change.	a) Establish infrastructure to sustain change. b) Adjust implementation as needed in response to evaluation of progress.	i. Maintain feedback at decreased frequency regarding rates of screening, referral and treatment uptake. ii. Provide feedback to practices. iii. Help practices adjust in response to feedback.

Table 3

Baseline patient participant characteristics

	All patient participants (n= 30)	MCPAP for Moms alone (n= 9)	PRISM (n = 21)
Age (mean years $\pm$ SD)	31.27 $\pm$ 5.89	28.44	32.47
White (%)	7 (23.33)	1 (11.11)	6 (28.57)
Hispanic	15 (50.00)	4 (44.44)	11 (52.38)
Other	8 (26.67)	4 (44.44)	4 (19.05)
Public Insurance (%)	19 (66.00)	5 (62.50)	14 (66.67)
Trimester 1	11 (36.67)	7 (77.78)	4 (19.05)
Trimester 2	5 (16.67)	1 (11.11)	4 (19.05)
Trimester 3	14 (46.67)	1 (11.11)	13 (61.90)

Trimester 1: less 14 weeks' gestational age, Trimester 2: 14 weeks until 28 weeks gestational age and Trimester 3: after 28 weeks' gestational age.