



# The best perinatal depression screening: Is self-administered PHQ2 more feasible than a nurse-administered one?

Sarah Reinstein MD<sup>1</sup> | Kate Lieb MD<sup>1</sup> | Peter S. Bernstein MD, MPH<sup>2</sup>  |  
Chavi Eve Karkowsky MD<sup>2</sup> 

<sup>1</sup>Department of Psychiatry, Montefiore Medical Center/Albert Einstein College of Medicine, Bronx, New York

<sup>2</sup>Department of Obstetrics & Gynecology and Women's Health, Montefiore Medical Center/Albert Einstein College of Medicine, Bronx, New York

## Correspondence

Chavi Eve Karkowsky, Department of Obstetrics & Gynecology and Women's Health, Montefiore Medical Center/Albert Einstein College of Medicine, 1825 Eastchester Rd, Bronx, NY 10461.  
Email: ekarkows@montefiore.org

## Abstract

**Purpose:** To assess perinatal depression screening via self-administered PHQ2 (SAP) vs nurse-administered PHQ2 (NAP).

**Design and Methods:** NAP screening was performed for 3 months, followed by SAP. Data were gathered from visits at 24 to 28 weeks gestation.

**Findings:** One hundred twenty-seven patients were in NAP arm, 100 in SAP arm. SAP had higher rates of screening (odds ratio [OR], 3.25; 95% confidence interval [CI], 1.63-6.49), but no difference in positive PHQ2 screens. The SAP rate of therapeutic action for positive screens was lower (OR, 0.24; 95% CI, 0.12-0.50).

**Practice Implications:** SAP provided higher perinatal depression screening rates compared to NAP, but decreased therapeutic action.

## KEYWORDS

depression, postpartum period, pregnancy, screening method

## 1 | INTRODUCTION

Depression is currently the most common mental health illness in the United States.<sup>1</sup> Women during and after pregnancy are particularly vulnerable to this condition, when the prevalence is high; estimates of the percentage of women with depression during and after pregnancy is approximately 9 to 10 percent.<sup>2</sup> Untreated depression in pregnancy and postpartum is associated with increased risks for both preterm delivery and low birth weight.<sup>3</sup> Recent attention to depression in the postpartum period has shown it to be a particularly potent public health problem, impacting both women and children's health, and even becoming a major cause of maternal mortality within the first year after delivery.<sup>4</sup>

Given the high prevalence and widespread effects of depression during pregnancy and postpartum both the American Academy of Obstetrics and Gynecology and the United States Preventative Services Task Force now recommend routine screening for depression during the pregnancy and postpartum periods.<sup>2,5</sup> Most interpret this recommendation to screen during the third trimester and then during the postpartum period. Given the scale of this mental health

problem, and the number of patients involved, any large-scale screening test needs to be both effective and reliable.

However, it is difficult to implement widespread depression screening at prenatal care sites. Research has shown that barriers to screening exist at the patient, provider, and systems-level.<sup>6</sup> Systems-level factors that limit effective screening include limited clinical time and resources.<sup>7</sup> Up to 50% of perinatal women remain unscreened for depression, despite initiatives to increase the screening rate.<sup>8,9</sup> Any successful screening method will need to overcome these barriers and maximize resources without losing its efficacy as a method for detecting the disorder.

As more sites attempt to implement widespread maternal depression screening, many of those settings utilize the PHQ2, a short but validated screening tool for depression.<sup>10,11</sup> Often, the PHQ2 is administered verbally by nursing staff as part of a review of systems. However, a self-administered written questionnaire presents an opportunity for increased privacy for the patient and decreased use of nursing time; it may represent a way to increase the feasibility of depression screening without losing efficacy. No current research exists comparing the self-administered and verbal nursing-administered

methods of the PHQ2 screen and the comparative effectiveness of these two modalities.

This study was designed to assess whether screening via a self-administered paper PHQ2 questionnaire is a feasible method for depression screening in a prenatal care setting. Our primary outcome was the rate of screening accomplished; secondary outcomes included the rate of positive screens, the utilization of social work (SW) and other mental health services, and the rate of postpartum depression.

## 2 | MATERIALS AND METHODS

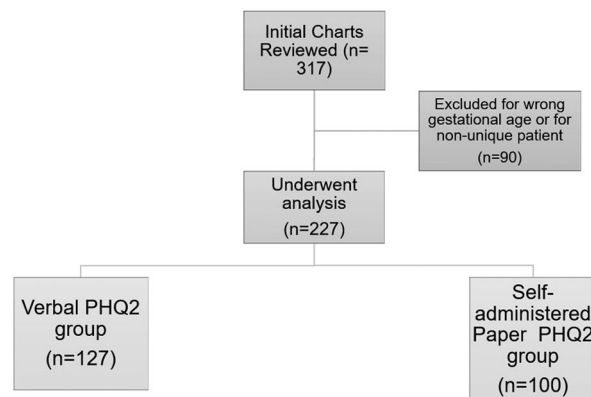
This study was approved by the Medical Center Institutional Review Board, with compliance with all relevant precautions regarding protected health information and patient privacy. The study was performed at one of the largest obstetrics and gynecology clinics operated by a large urban medical center, a practice that is situated at a Federally Qualified Health Center and serves a large urban population with low socioeconomic status.

This study was a time-defined prospective cohort study. Before initiation of the study, usual practice at the clinic was to have nursing staff at the office perform depression screening verbally at every prenatal care visit, as well as at postpartum visits. Upon initiation of the study, in May 2016, data were prospectively collected for 3 months on all patients who presented for a prenatal appointment between 24 weeks and 0 days and 28 weeks and 6 days of gestation; this period was the “nursing-administered PHQ2” (“NAP”) period.

Subsequently, for 3 months starting in late July 2016, we implemented change to clinical practice by instituting a paper PHQ2 screen at the clinic, which was handed out by front desk staff as the patient presented to check in for the appointment, and self-administered by the patient. Both the front desk staff and the nursing staff were trained in the new workflow before implementation. The front desk staff were provided a sample script for introducing the paper screen, including the following main points: that the paper the patient was receiving was a tool for screening for prenatal depression; that the tool was voluntary; that the screen was intended for use at each prenatal visit; and that a nurse would both collect answers and be available for any questions regarding the screen. The nursing staff was already familiar with the PHQ2 screen from the clinic’s prior practice.

The paper PHQ2 was then collected by clinical staff during the nursing assessment, along with vital signs. The PHQ2 was entered by the nurse into the electronic health record at that time. The protocol in terms of screening at every prenatal and postpartum visit was otherwise unchanged. This period was the “self-administered PHQ2” (“SAP”) period.

Patients who presented for prenatal appointments between 24 weeks and 0 days and 28 weeks and 6 days of gestation during this period were collected prospectively. The group of patients screened by NAP during their index visit comprise the NAP group, and the group of patients screened by SAP during their index visit



**FIGURE 1** Study design

comprises the SAP group. The patient who had two visits at the appropriate gestational age during the study visit had only their first visit utilized for data collection. Please see Figure 1 for representation of study design.

Data were collected retrospectively through a review of charts of all patients from both groups after the pregnancies and 6-week postpartum period was completed. Charts were initially drawn from electronic medical records via gestational age. Demographic data, including past mental health diagnoses, mental health screening, and outcome data, pregnancy and delivery data were all abstracted manually from the medical records. High-risk pregnancy status was classified by the patient being seen for two or more visits in the high-risk pregnancy program on site. A score of three and above on the PHQ2 was considered a positive screen which activated a referral to a social worker within the clinic. All databases were kept on password-protected drives; in addition, once data collection was complete, all identifying patient information was erased from the main database, which instead utilized a study-specific subject number.

Clinic practice at the time included referral to SW or other services that were generated for reasons other than positive depression screening. SW referrals were often initiated for psychosocial indications, including unstable housing, food insecurity, positive screens for domestic violence, or a positive history or current illicit drug use, as well as other indications. Adolescents and those with a history of depression are also routinely referred to mental health providers regardless of PHQ2 results.

Results were analyzed individually via parametric and non-parametric tests as appropriate. The analysis was then performed via a multivariable logistic regression model. This model was created using the stepwise model. In brief, the model is created to start with the intercept and the method variable of the study; further variables are added if they satisfy an entry  $P$ -value criterion of  $P = 0.35$ . Once a new variable is integrated, all the variables in the model are then assessed to see which variable can be removed based on a second prespecified  $P$ -value of  $P \geq 0.05$ . This process of adding/removing variable is iterated until no more variables can be added or removed, at which point the model is considered saturated or optimal.

Our primary outcome was the rate of screening; secondary outcomes included the rate of positive screens, the utilization of social work and other mental health services, and the rate of postpartum depression

### 3 | RESULTS

A total of 317 charts were reviewed in this study after being identified by the electronic medical record as being between 24 to 28 weeks during the periods of the study; see Figure 1. Initial review verified gestational age at the index visit, and patients were excluded if their index visit was not at the 24 to 28-week gestational age at the prenatal visit during the study period. Patient visits were also excluded if they had already had a prenatal visit during gestational age of 24 to 28 weeks visit before the initial study period; that is, only one encounter for any individual during the study period was utilized. Thus, all patients in our database are “unique,” and do not represent multiple visits by the same patient.

Ultimately, 227 unique patients were included in the study, 127 during the NAP period and 100 during the SAP period. Table 1 shows the demographics and the stratification by method, NAP vs SAP. The two groups were similar overall, with significant differences in parity, frequency of prenatal visits, rates of high-risk pregnancy and complications during pregnancy.

We were not able to analyze the prevalence of positive PHQ2 screens, since, among all patients, there were only two patients with a PHQ2 score greater than 3. Both patients were in the SAP group.

The rate of screening accomplished was significantly higher in the SAP group when analyzed as a univariate variable, 14.6% screening at 24 to 28 weeks for NAP group and 29.5% screening for 24 to 28 weeks visit for SAP period group, with a  $P < 0.0001$ . These results were consistent after multivariable analysis that controlled for differences in the groups showed that the screening rate during the SAP period was significantly higher when compared with the NAP group (odds ratio [OR], 3.25; 95% confidence interval [CI], 1.63-6.49).

Of note, patients with diagnoses of hypertension or diabetes in pregnancy were not more likely to be screened. Patients with “other” complications of pregnancy (ie, medically significant complications that were not part hypertension or diabetes) were significantly more likely to have PHQ2s administered at index visit (OR, 2.5; CI, 1.06-5.92). Actions taken (referral to social work or psychiatry) during this period were taken for reasons other than PHQ2 positive screen, given the low rate of PHQ2 positive screens. However, overall referral to mental health services was lower during the SAP period, than during the NAP period (OR, 0.24; 95% CI, 0.12-0.50) with the rate referral to a SW significantly lower for patients during the SAP period (OR, 0.20; 95% CI, 0.09-0.45). Overall, mental health action was taken more frequently for patients who had a history of depression (OR, 11.34; CI, 4.40-29.27), and more frequently for younger patients (OR, 0.90; 95% CI, 0.84-0.95).

**TABLE 1** Demographical table and stratification by method

Variables	Method		P value
	NAP (N = 127)	SAP (N = 100)	
Age, mean (SD)	29.4 (5.9)	29.3 (6.0)	0.89
BMI, mean (SD)	30.8 (7.5)	31.4 (7.6)	0.56
GA encounter, median (IQR)	26.4 (25.3-27.4)	26.3 (25.3-27.2)	0.24
Gravidity, median (IQR)	3 (2-4)	3 (2-4)	0.49
Parity, median (IQR)	1 (0-2)	1 (1-3)	<b>&lt;0.0001</b>
Total number of prenatal visits, median (IQR)	11 (8-12)	8 (4-11.5)	<b>&lt;0.0001</b>
Ethnicity, n (%)			0.21
Not Hispanic	52 (41)	33 (33)	
Hispanic	46 (36)	34 (34)	
Unknown	29 (23)	33 (33)	
Race, n (%)			0.31
White	7 (6)	11 (11)	
Black	31 (24)	22 (22)	
Other	89 (70)	67 (67)	
Insurance, n (%)			0.95
Public	91 (72)	72 (72)	
Private	36 (28)	28 (28)	
History of depression, n (%)			0.71
No	107 (84)	86 (86)	
Yes	20 (16)	14 (14)	
High-risk pregnancy, n (%)			<b>0.02</b>
No	62 (50)	66 (66)	
Yes	62 (50)	34 (34)	
Mode of delivery, n (%)			0.42
Vaginal	76 (62)	47 (57)	
C-section	46 (38)	36 (43)	
Complication during pregnancy, n (%)			<b>0.04</b>
HTN	10 (8)	8 (8)	
DM	14 (11)	8 (8)	
Other	32 (26)	15 (15)	
Mixed	18 (15)	8 (8)	
None	50 (40)	60 (61)	
Complication during delivery, n (%)			0.47
HTN	8 (7)	5 (6)	
Hemorrhage	3 (2)	4 (5)	
Shoulder dystocia	0 (0)	2 (2)	
Other	10 (8)	7 (8)	
None	100 (83)	65 (78)	

Abbreviations:GA, gestational age; HTN, hypertension; DM, diabetes mellitus; BMI, body mass index; IQR, interquartile range; NAP, nurse-administered PHQ2; SAP, self-administered PHQ2; SD, standard deviation P-values of 0.05 or less are shown in bold.

The multivariate results also showed that patients initially screened using the SAP were less likely to keep their postpartum visits (OR, 0.54; 95% CI, 0.29-0.99). Of the women who went to postpartum visits and were screened by PHQ2 at that postpartum visit, there was no significant difference in the number of patients with a positive PHQ2 score between patients who had been in the SAP or NAP periods during their 24 to 28-week visit earlier in the pregnancy (OR, 2.17; 95% CI, 0.27-17.27); however, there were only 4 subjects in total with a positive PHQ2 score at postpartum appointment. There was no difference between the two study periods in the mode of delivery, the rate of preterm delivery, or NICU admission of the newborn.

## 4 | CONCLUSIONS FOR PRACTICE

In this study of two ways to perform screening for depression during prenatal visits, the rates of screening for depression via PHQ2 were significantly higher during the period where SAP was utilized. These results support the feasibility of utilizing the SAP screen to accomplish maternal depression screening in an office setting.

There were a very low number of positive PHQ2 screens in our study, both at index visits and at postpartum visits, limiting our ability to assess the change to SAP on which method is superior at identifying patients with depression.

In terms of patients with "high-risk" pregnancies, and the associated anxiety and stress that presumably accompany them, diabetes and hypertension were not associated with a higher rate of screening, though "other" conditions were. In our clinic, both the NAP and the SAP verbal PHQ2 pass through clinical nursing staff (the NAP is administered and recorded by nursing staff; the SAP is still reviewed and recorded by nursing staff.) In this way, it is reasonable that clinical acuity would affect PHQ2 screening as entered into the electronic medical record. However, although diabetes and hypertension are significant conditions in pregnant women, our clinic sees a significant number of patients with both these conditions, similar to the high prevalence seen in other low socioeconomic populations.<sup>12</sup> Thus these "routine high-risk" patients may not register as in need of uncommon care by the clinical staff, which would perhaps explain why their presence was not associated with more thorough screening. In contrast, "other" complications of pregnancy could include more rare diagnoses that could prompt clinic staff to warrant more careful screening, including depression screening. However, the low rate of screening for the hypertensive and diabetic patients is an item of concern. Staff and nursing training of the need for perinatal depression screening in all patients, but particularly those with medical comorbidities, was undertaken after these results.

The rates of screening were low for the NAP (14.6%) and the SAP (29.5%) groups. Both groups fell far below our goal of screening every patient, and these results highlight the need for more effective, depression screening in the clinic. The relative increase with SAP method was impressive; however, and gave our clinic further ideas of how to increase our screening rate.

Although there was a higher rate of screening with the SAP cohort (29.5%), we saw a lower referral rate to mental health services for this group. It is important to note that most SW referrals in our cohorts were not prompted by positive PHQ2 screenings at the index 24 to 28 weeks visit, as there were only 3 positive PHQ2 screens at that visit. Instead, most of our patients are referred for a myriad of psychosocial indications as discussed above, and thus the rate of SW referral may be independent from depression prevalence or screening. In addition, the differential between the SW visit frequency in the two cohorts may be explained by structural events within the clinic: during the 3 months when the SAP cohort was collected, there was an unexpected transition in the staffing of social work coverage at the clinic leading to coverage changes during part of the SAP period. During this time, social work services were still covered by a social worker from an adjoining clinic, who would be paged to come to the prenatal clinic. Though social workers were still available throughout the clinic day, the coverage system may have created a logistic barrier to both requesting the referral on the part of the nurse, and/or accepting the referral on the part of the patient. This transition may have impacted the referral rate. Although this requires more research, it does reinforce the importance of integrative care or imbedding mental health professionals in the primary care setting.

Patients with a history of depression were noted to have more action taken during their pregnancies, despite a paucity of positive screens, regardless of the screening method. This reflects our clinic culture of proactively referring patients with risk factors to mental health resources. In addition, younger patients were also referred to social work more often, reflecting with our clinic practice of referring any patient under the age of 19 for social and emotional support evaluation. Both these referrals are consistent with the literature which shows that these populations are more vulnerable to developing depression during pregnancy.<sup>13</sup> It is therefore expected and appropriate that these women would elicit more action after a positive screen.

The postpartum data showed that women with more prenatal visits were more likely to go to their postpartum visits. It is reasonable to assume that women who are compliant with appointments during pregnancy are more likely to be compliant with appointments after pregnancy. It was also noted that patients in the SAP group were less likely to keep their postpartum visits. We plan to do further research to assess whether this lower rate of postpartum visit is related to having undergone the SAP. For example, patients could find the receipt of the paper form of the SAP off-putting or alienating, and that could impact their decision to return for care after delivery; but further study would be required to replicate and understand this result.

The strengths of this study included its prospective design, as well as its real-world change in practice. A weakness of the study was its lower-than-expected enrollment. This occurred because the number of appropriate gestationally aged patients during the periods of NAP and SAP was lower than anticipated. Finally, the suboptimal coverage of social work in the clinic during the study was unforeseeable but possibly impacted findings in terms of referral

rates and mental health follow-up. In addition, our SAP screening were paper-based. The use of digital tablets to perform perinatal depression screening is a promising area of innovation, and would further increase both patient privacy and clinic efficiency. This would be another important area for future research.

In conclusion, our study shows that an SAP is a feasible form of depression screening compared to NAP, and may be superior in terms of increasing the screening rate. For many sites with staffing and privacy challenges, the SAP method might be a low-cost and powerful option for increasing screening rates in obstetrical care sites. This, in turn, may help ensure that the patients who are most in need of help during and after pregnancy are not overlooked, and better address this common and serious complication of the perinatal period.

## CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

## ORCID

Peter S. Bernstein  <http://orcid.org/0000-0002-9559-4512>

Chavi Eve Karkowsky  <http://orcid.org/0000-0002-6500-7049>

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**How to cite this article:** Reinstein S, Lieb K, Bernstein PS, Karkowsky CE. The best perinatal depression screening: Is self-administered PHQ2 more feasible than a nurse-administered one? *Perspect Psychiatr Care*. 2020;56:81–85. <https://doi.org/10.1111/ppc.12383>