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Detection of Postpartum Depressive Symptoms by Screening at Well-Child Visits

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ABSTRACT. *Objective.* To assess 1) the feasibility of universal postpartum depression screening during well-child visits in the first year of life, 2) the prevalence of postpartum depressive symptoms among mothers who attend first-year well-child visits, 3) detection of postpartum depressive symptoms in a pediatric clinic before and after universal screening at each first-year well-child visit, and 4) social work referrals before and after universal screening.

Methods. The practice instituted universal screening for postpartum depressive symptoms during first-year well-child visits using the Edinburgh Postnatal Depression Scale (EPDS). We randomly selected 110 infant medical records before (cohort 1) and 110 after (cohort 2) screening was initiated. Measures included demographics, notation of depression or depressive symptoms in the well-child visit note, and referral for depression. EPDS scores were collected for cohort 2 only. Before–after comparisons were made for detection of depression or depressive symptoms and mental health referrals.

Results. The EPDS was included in the medical record in 46% of well-child visits. Eighty-eight percent of these forms were completed. Twenty-one percent of completed EPDS forms had scores ≥ 10 , and 27% of women who completed the EPDS had scores ≥ 10 sometime during the postpartum year. There was a significant increase in documentation of depressive symptoms with the EPDS after initiation of universal screening (1.6% of visits [cohort 1] vs 8.5% [cohort 2]). Social work referrals for mental health reasons increased significantly (0.2% of visits [cohort 1] to 3.6% [cohort 2]).

Conclusions. Women with high levels of postpartum depressive symptoms are common in an urban population and can be detected at well-child visits throughout the first postpartum year by pediatricians using a standardized screening tool. Because screening for depression during well-child visits is feasible using a standardized screening instrument, pediatricians can play an active role in early detection and referral for postpartum depression. *Pediatrics* 2004;113:551–558; *postpartum depression, maternal depression, screening, detection.*

ABBREVIATIONS. EPDS, Edinburgh Postnatal Depression Scale; SD, standard deviation.

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Healthy People 2010 identifies depression as 1 of 10 leading public health concerns in the United States.¹ Pediatricians have become increasingly concerned about maternal depression^{2–4} because of the high rates experienced by women throughout their childbearing years^{5–9} and the associated negative effects on mothers, infants, and children.

Maternal depression is a nonspecific term that refers to depression in mothers of young children. "Postpartum depression," a more specific term, is used to describe a continuum of depressive symptoms and diagnoses that occur in the weeks to months after childbirth. The *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition Text Revision* uses a time frame for onset of symptoms within 4 weeks of childbirth and restricts the use of the postpartum specifier to major depression, bipolar disorder, and brief psychotic disorder.¹⁰ Researchers and mental health clinicians often use a more extensive time frame for the onset of depression, such as within the first 3 months¹¹ or even up to 1 year after childbirth.¹² Our study uses the most liberal time frame: up to 1 year after childbirth.

Prospective longitudinal studies of pregnant and postpartum women in the United States,⁶ Canada,⁷ and England^{8,9} have found that postpartum depression affects approximately 10% of new mothers and can have lasting effects on women,^{13–15} children,^{16–25} and families.²⁶ Women with postpartum depression are at increased risk for future depression,^{14–23,26,27} recurrent postpartum depression,^{7,8} thoughts of harming their infants,^{28–30} difficulty with maternal–infant bonding,^{17–20,31} and changes in plans for future children.³² Postpartum depression may have a negative impact on infants' cognitive, social, and behavioral development,^{20–25,33–37} including increased rates of behavioral disturbance among school-aged children.^{25,36} Maternal depression may also impair attention to pediatric preventive practices, such as the use of car safety seats,³⁸ and pediatric health care utilization.^{39–41}

Depressed women often do not recognize their symptoms as depression.⁴² It is particularly difficult for women with new infants to disentangle symptoms of depression, such as fatigue, early morning awakening, or weight loss, from the normal adaptation to life with a new infant. Clinicians recognize only approximately half of depressed women during routine clinical care.^{43–48} The obstetrician's office has

been the primary setting for detection of postpartum depression, but it is poorly detected in this setting⁴⁶ and often occurs after the typical 4- to 6-week obstetric visit.^{49,50} Therefore, relying only on obstetricians to detect depressed mothers is problematic, and alternative settings for detection are needed.

An alternative setting for detection of postpartum depression is the pediatric well-child visit. Pediatricians, who care for four fifths of children younger than 5 years,⁵¹ may be the only medical providers encountered routinely by mothers during the first year of a child's life. The American Academy of Pediatrics Recommendations for Preventive Pediatric Health care include a minimum of first-year well-child visits at 2 to 7 days; by 1 month of age; and at 2, 4, 6, 9, and 12 months of age.⁵² These visits allow for repeated observations of mood and behavioral changes in mothers and infants. Although pediatricians are not the mothers' health care providers, they are trained to consider the family environment and to ask questions about maternal issues such as breastfeeding and domestic violence.⁵³ When children and mothers are followed by the same family practice physician, the family physician may be uniquely situated to address postpartum depression.

Although maternal screening for depression at pediatric well-child visits seems promising, a number of practical barriers to its implementation exist: 1) simple screening tools specifically designed to screen for postpartum depression have not been validated in the pediatric setting; 2) the mother is not the identified patient; 3) pediatricians and family physicians have many issues to cover during the limited time frame of a well-child visit; and 4) under some health care plans, pediatricians are not able to refer mothers directly to mental health providers.

We conducted this study to begin to address some of these issues. The study objectives were to 1) assess the feasibility of universal postpartum depression screening using a standardized screening tool during first-year well-child visits, 2) establish the prevalence of postpartum depressive symptoms among mothers who accompany their children to first-year well-child visits, (3) compare detection of postpartum depressive symptoms before and after institution of standardized screening at each first-year well-child visit, and (4) compare social work referrals before and after systematic screening as a preliminary indicator of the screening's effectiveness.

METHODS

Setting

The study was conducted in a large pediatric primary care practice at the University of Rochester Medical Center in Rochester, NY. The practice, which serves 10 000 children and adolescents, including 900 newborns, per year is a primary teaching site for pediatric residents and medical students. It is multidisciplinary with pediatricians, pediatric nurse practitioners, social workers, and other specialized personnel. For children younger than 1 year, approximately 60% of well-child visits are conducted by pediatric nurse practitioners and 40% by attending pediatricians alone or with pediatric residents. Before the study, no systematic screening for postpartum depression occurred. The University of Rochester Research Subjects Review Board approved the study.

Postpartum Depression Screening Instrument

The Edinburgh Postnatal Depression Scale (EPDS) is a 10-item self-administered questionnaire developed to assess depression in women who have recently given birth.⁵⁴ It is not a diagnostic tool but a screening tool that asks about depressive symptoms in the "past 7 days." It has been validated in many cultures, settings, and large community samples,⁵⁵⁻⁶³ including among nonpostpartum women.⁵⁹ Comparing the EPDS with the Research Diagnostic Criteria⁶⁴ for major depression using the Diagnostic Interview Schedule⁶⁵ at a mean of 12 weeks postpartum, the EPDS had a sensitivity of 100% and specificity of 90% for major depression with a cutoff score of 10 in a community sample of 103 Australian women.⁶⁰ In a large community sample of 702 women in Cambridge, England, the Standardized Psychiatric Interview⁶⁶ was used to validate the EPDS at 6 weeks postpartum and found a similar specificity of 83% and sensitivity of 93% for major depression and sensitivity of 82% for minor depression.⁵⁵

Standardized Screening

In November 2000, the practice instituted a change in its standard of care so that all mothers received the EPDS at each well-child visit during the child's first year, starting with the routine 2-week visit. Well-child visits were selected because they focus on wellness, mothers are routinely asked questions about the family environment, and longer visits are scheduled to accommodate time for discussion of infant needs. Group informational meetings provided practice physicians, residents, nurses, and social workers written and verbal instructions regarding the implementation of standardized screening, the clinical use of the EPDS and its sensitivity and specificity at standard cutoff scores (≥ 10 and ≥ 12), and guidelines for referral. Providers were instructed as follows: "The EPDS score should not override clinical judgment. The EPDS score should be used to enhance the clinical assessment of the mothers." There were no formal "booster information sessions." A mechanism for addressing family and maternal issues was already in place with social work coverage within the practice.

Mothers received the EPDS as standard care along with other paperwork from the nurse who weighed and measured the child. Nurses requested that mothers complete the EPDS while waiting for providers in the examination room. All EPDS forms were to be included in the infant record whether mothers completed them or not. Providers were to calculate the score and make a clinical decision regarding additional action.

Design

This study used a before and after design, evaluating 2 separate cohorts of children. We randomly selected 220 infant medical records: 110 before and 110 after initiation of screening. Sample size was calculated using hypothesized rates of detection of depression (5% before screening⁴⁴ and 20% after screening⁴⁷), $\alpha = .05$, power = .80, and anticipated exclusions (ie, infants not accompanied by mother).

Data were collected from medical records of infants who received their well-child care in the practice during their first year of life. The prescreening group, cohort 1, included the medical records of 110 infants who were born between December 31, 1998, and October 5, 1999, and did not include EPDS forms because the visits occurred before universal screening. Cohort 2 included 110 infants who were born between December 29, 1999, and October 21, 2001. All cohort 2 infants had at least 1 well-child visit at which the mother had the opportunity to receive an EPDS. All chart data were collected by research personnel.

Measurements

The practice uses age-specific standard forms for each well-child visit and follows the American Academy of Pediatrics recommendation for routine well-child visits (2 weeks and 2, 4, 6, 9, and 12 months). We did not collect data from the 2- to 7-day visit as this visit is generally reserved for infants who are discharged in <48 hours from the hospital and therefore does not apply to all infants. Completion of the well-child visit as evidenced by a completed standard form was used to define an opportunity for detection of postpartum depressive symptoms.

Data were gathered retrospectively from the age-specific standard forms (for cohorts 1 and 2) and the EPDS forms (for cohort 2) in the infant medical records. Variables collected included demo-

graphic information such as maternal age, infant age, infant race/ethnicity, infant birth weight, gestational age, number of siblings, number of well-child visits, and health insurance. Outcome variables included detection of depression or depressive symptoms (defined below) and social work referrals (including referral rationale and attendance). Referrals to other providers were also recorded. Detection was defined as any written documentation in the well-child visit form of any 1 or more of the following: 1) mother is identified as depressed or having a depressed or sad mood, 2) mother is taking antidepressant medications, and/or 3) mother is under care for depression. For cohort 2, detection of depressive symptoms also included a completed EPDS form with a score of 10 or greater.

We recorded the presence or absence of each EPDS form in the medical record, whether the clinician scored the EPDS, the provider's calculated score, and research personnel's calculated score. All analyses were based on EPDS scores calculated by research personnel. Each EPDS form was recorded according to the age-specific well-child visit at which it was received.

Data Analysis

Primary analyses conducted were descriptive comparisons of detection and referral rates for cohorts 1 and 2. χ^2 and Fisher exact tests were conducted for detection and social work referrals. Univariate analyses of EPDS scores were conducted. For testing for secular trends of detection, post hoc analyses were conducted using χ^2 and Fisher exact tests to compare detection at all well-child visits in cohort 1 and well-child visits in cohort 2 that occurred before screening was initiated.

RESULTS

No statistically significant differences were noted between cohorts 1 and 2 with regard to the demographic characteristics, including maternal age, health insurance, number of pregnancies, infant race and ethnicity, infant birth weight, gestational age, Apgar scores, number of pregnancies, or number of siblings (Table 1). This is an urban, poor population with a high proportion of children who were black or Hispanic. Infant race and ethnicity are recorded in the medical records on the basis of parental or guardian report. They are gathered as part of the routine demographic data obtained on initiation of care.

Mothers' race and ethnicity were not included in infants' medical records and therefore were unavailable for analysis. There was a statistically significant difference between cohorts 1 and 2 with regard to the number of well-child visits attended. The total number of well-child visits attended was 502 in cohort 1 and 439 in cohort 2. In cohort 2, 216 visits occurred before and 223 visits occurred after screening was initiated. The mean number of well-child visits attended for cohort 1 was 4.56 (standard deviation [SD]: ± 1.62) and for cohort 2 was 3.96 (SD: ± 1.47 ; $P = .004$). This difference likely reflects the study design. Cohort 1 included infants who were all at least 1 year of age at the time data were collected retrospectively and therefore had the possibility of attending up to 6 well-child visits during that year. Because cohort 2 was enrolled throughout the second study year, it included 1-year-old or younger infants. Therefore, on average, some of these infants did not have the opportunity to attend 6 well-child visits before the data were collected. The comparative analyses included all completed well-child visits as opportunities to detect postpartum depressive symptoms.

Feasibility

The first objective was to assess the feasibility of standardized postpartum depression screening in a busy practice. This involved analysis of cohort 2 data only. Of 223 visits that occurred after the initiation of screening, 102 (46%) visits included an EPDS form in the medical record. Figure 1 illustrates the completion and accuracy of scoring. Inaccurate scoring in all 10 cases was limited to 1-digit addition errors. In 1 case, the error could have possibly influenced clinical decisions (clinician score = 9, actual score = 10).

TABLE 1. Demographic Characteristics of Cohort 1 and Cohort 2

Variable	Cohort 1 (N = 110)	Cohort 2 (N = 110)
Maternal age, y, mean (SD)	23.5 (6.4)	23.2 (5.7)
Health insurance, n (%)		
Medicaid	70 (63.6)	83 (75.5)
Private	26 (23.6)	13 (11.8)
Self-pay*	13 (11.8)	14 (12.7)
Other	1 (0.9)	
Infant race/ethnicity, n (%)†		
Black	76 (69.1)	79 (71.8)
White	18 (16.4)	15 (13.6)
Hispanic	11 (10.0)	9 (8.2)
Asian	2 (1.8)	1 (0.9)
Other	3 (2.7)	3 (2.7)
Birth weight, g, mean (SD)	3135 (642)	3028 (639)
Gestational age, wk, mean (SD)	38.9 (2.6)	38.4 (2.7)
Apgar scores, mean (SD)		
1 min	7.8 (1.8)	7.7 (2.0)
5 min	8.7 (1.0)	8.7 (1.0)
No. of pregnancies, mean (SD)	3.1 (2.1)	3.1 (2.2)
No. of siblings, mean (SD)	1.3 (1.3)	1.2 (1.4)
No. of well-child visits, mean (SD)	4.56 (1.6)	3.96 (1.5)‡

* "Self-pay" includes "Medicaid pending," denoting children who have started the paperwork to obtain Medicaid.

† Race and ethnicity were determined from the clinic's billing/encounter files.

‡ Statistical significance $P < .05$.

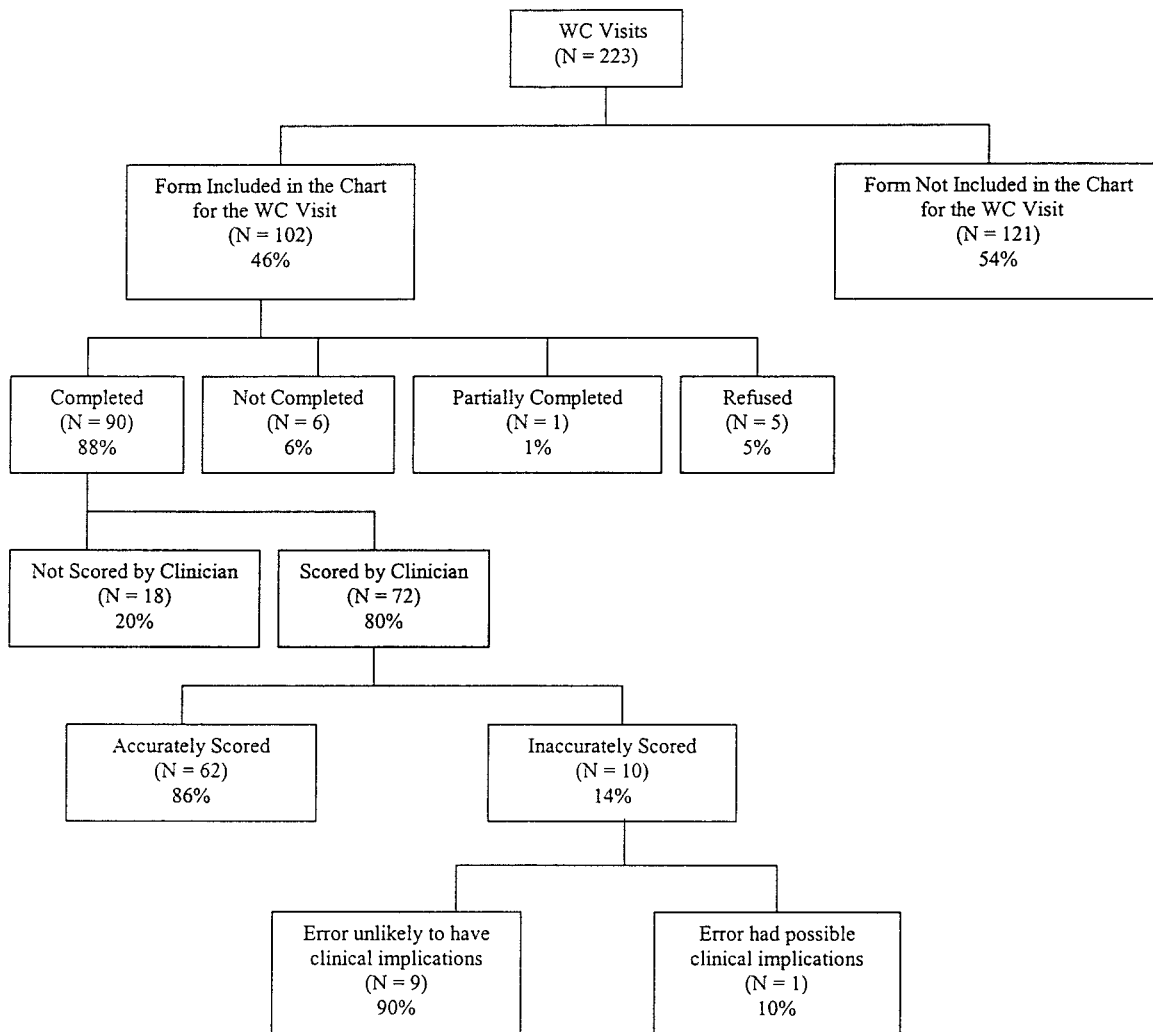


Fig 1. Feasibility of screening mothers with the EPDS at well-child visits. WC indicates well-child.

Prevalence

The second objective was to describe the prevalence of high levels of postpartum depressive symptoms among mothers who attend first-year well-child visits. Because we relied on the EPDS for the prevalence, we calculated the proportion of EPDS scores ≥ 10 among the visits in which the chart included a completed EPDS. Of the 90 completed EPDS forms, 19 (21%) forms met this criterion. For each well-child visit, between 7% and 40% of completed EPDS forms had a score of ≥ 10 (Table 2). These proportions are based on small cell sizes.

Because the EPDS may have been completed more than once by the same woman, we calculated the proportion of women with EPDS scores > 10 among

the total number of women who completed the forms. Among 91 women who had the opportunity to receive the EPDS, 66 (72%) had EPDS forms in the infant record and 60 of those completed at least 1 EPDS. Among the women who completed the forms, 16 (27%) had high depressive symptoms some time during the postpartum year.

Detection

The third objective was to compare the detection of depression or depressive symptoms in the first postpartum year before and after universal screening (Table 3). There was a statistically significant increase in detection in cohort 2 as defined by any evidence of documentation of depression or depressive symp-

TABLE 2. Point Prevalence of High Levels of Depressive Symptoms Among Completed EPDS Forms at First-Year Well-Child Visits

	Well-Child Visit					
	2 wk	2 mo	4 mo	6 mo	9 mo	12 mo
Completed EPDS Forms	20	20	15	15	15	5
EPDS ≥ 10	4 (20%)	6 (30%)	1 (6.7%)	3 (20%)	3 (20%)	2 (40%)
EPDS ≥ 12	3 (15%)	3 (15%)	0	3 (20%)	1 (6.7%)	1 (20%)
EPDS scores	10, 12, 17*, 20*	10, 10, 11*, 14*, 16*, 16	10*	13*, 15, 15	10, 11, 18*	10, 17

* Documented as depressed in well-child visit form.

TABLE 3. Detection of Postpartum Depressive Symptoms at First-Year Well-Child Visits Before and After Universal Screening

Location of Documentation*	Cohort 1 (N = 502 Well-Child Visits)		Cohort 2 (N = 223 Well-Child Visits)		
	Well-Child Form	Well-Child Form or EPDS ≥10	Both Well-Child Form and EPDS ≥10	EPDS ≥10 Only	Well-Child Form Only
Documentation of depression or high depressive symptoms	8 (1.6%)	19 (8.5%)†	11 (4.9%) NS	8 (3.6%) NS	0 (0.0%) NS

NS indicates not significant.

* Each cohort 2 "Location of Documentation" is in comparison with cohort 1.

† $P < .001$.

toms during the well-child visit (1.6% in cohort 1 and 8.5% in cohort 2; Table 3).

We calculated the rates of detection at each well-child visit before and after universal screening using number of visits as the denominator (Table 4). Detection of high depressive symptoms (EPDS ≥10) occurred throughout the postpartum year after the initiation of screening with the EPDS. Although trends toward higher detection rates were noted at each visit, significance testing was limited by sample sizes within the well-child care strata.

Referrals

The fourth objective was to compare referrals to social work for mental health purposes in the first postpartum year before and after initiation of screening. In cohort 1, 1 (0.2%) referral was made compared with 8 (3.6%) in cohort 2 (Fisher exact test, $P = .005$). In cohort 1, the woman completed the social work visit. In cohort 2, 7 (88%) women completed the visit. One hundred percent of the referrals to social work in cohort 2 had EPDS scores ≥10, and 88% had at least 1 score ≥ 12. Eight women with scores of ≥10 were not referred to social work.

Test for Secular Trends

Post hoc analyses were conducted comparing documentation of depression or depressive symptoms ($N = 8$) among cohort 1 visits ($N = 502$) with documentation ($N = 5$) among cohort 2 visits ($N = 216$) that occurred before initiation of screening, to account for the possibility of temporal change in clinic policy or standard care that would have an impact on detection of depression. There were no statistically significant differences for detection ($\chi^2 = 0.129$, $P = .719$) or social work referrals for maternal mental health (cohort 1 = 1/502, cohort 2 = 0/216; $\chi^2 = 0$,

$P = 1.0$), suggesting that secular trends other than initiation of EPDS screening were unlikely.

DISCUSSION

Feasibility

Our study was conducted in 1 type of real-world clinical setting, a busy urban pediatric practice in an academic medical center. The institution of universal screening was a change in standard care and was not part of a research protocol. These points are particularly important when considering the feasibility of screening at each first-year well-child visit using a standardized postpartum depression screening tool. The clinic had moderate success in screening mothers with the EPDS, as evidenced by the fact that the EPDS form was included in the medical record in 46% of the visits at which it should have been offered. In the first 3 months after the change in clinic practice, infant records were audited to provide feedback to the clinic staff regarding inclusion and completion rates of the EPDS. Meetings were also held with nursing staff to gain feedback regarding mothers' reactions to the EPDS as well as logistic problems or observations. Our findings are consistent with other studies that found changing practice environments is difficult—but not impossible.⁶⁷⁻⁷¹ Instituting systematic screening within busy practices is easier said than done, and a major barrier is that the screening is simply not conducted during many visits.⁶⁷

There are many possible explanations for this rate. First, the data were collected immediately after the institution of the change in care, thereby not allowing for adequate transition among staff to become accustomed to ensuring inclusion of the form in the medical record. We hypothesize that instituting a

TABLE 4. Rates* of Detection of Depression or Depressive Symptoms at First-Year Well-Child Visit: Before and After Screening

Well-Child Visit	Cohort 1		Cohort 2		Fisher Exact Test P Value
	Total No. of Visits	Documentation on the Well-Child Form, N (%)	Total No. of Visits	Documentation on the Well-Child Form and/or EPDS ≥10, N (%)	
2 wk	97	4 (4.1)	29	4 (13.8)	.081
2 mo	91	1 (1.0)	43	6 (13.9)	.004
4 mo	84	1 (1.2)	33	1 (3.0)	.486
6 mo	80	1 (1.3)	44	3 (6.8)	.125
9 mo	86	1 (1.2)	41	3 (7.3)	.099
12 mo	65	0 (0)	33	2 (6.0)	.111

* Rates use the number of visits among each age group as the denominator for calculations.

screening mechanism that is not directly related to pediatric care may take longer to integrate into clinic practice than a screening tool that is directly related to a pediatric illness or intervention. Second, staff described examples of clerical error and patient non-participation, practical issues that clinics must address with internal quality assurance reviews.

Willingness by mothers to complete a short self-report questionnaire is suggested by the finding that 88% of EPDS forms included in the medical records were completed. However, acceptability by mothers requires additional evaluation because we cannot determine the proportion of refusals among EPDS forms not included in the medical record. The process of using a self-report questionnaire that required the provider to calculate a total score and then, only in cases of high scores, make a clinical judgment seems to be acceptable to providers. It took a few minutes for mothers to complete the questionnaire and a few seconds for providers to score the EPDS items. This rapid process is essential given the limited time available during well-child visits.⁷²

Prevalence

Twenty-one percent of well-child visits with completed EPDS forms and 27% of mothers who completed an EPDS form had high depressive symptoms (EPDS ≥ 10). This rate exceeds the expected 10% to 20% prevalence in the general population⁶⁻⁹ but is consistent with other studies of depression among high-risk women in which depression was measured using more intensive diagnostic instruments.^{73,74} We must note that the prevalence may reflect a sample bias as it represents only those women who received and completed the EPDS. The bias could be in either direction. It is possible that women who refused did so because they were not depressed or did so because they were too depressed to complete the EPDS. Similarly, women who did not receive the EPDS may not have received it because clinicians did not have a "high suspicion" of depression and therefore did not give it to them.

The point prevalence of high depressive symptoms at each well-child visit (20%–40%) except the 4-month visit (7%) warrants additional comment. Many clinicians and researchers have noted what seems to be an increased risk of depression in the first 3 months postpartum.^{6,9,15} Our findings, although limited by small sample sizes, suggest a drop in high depressive symptoms at approximately 4 months but a resurgence later in the year. Whether the dip reflects a phenomenologic difference in depression at different points in the year, the natural pattern of postpartum depression, the "honeymoon" period of an interactive but not yet mobile infant, improved infant sleep patterns,⁷⁵ or a spurious finding is unknown. Larger studies are needed to answer these questions. Despite the limitations of the small sample sizes, to our knowledge, there no studies have established the point prevalence of depressive symptoms using the EPDS at each well-child visit in the postpartum year.

Detection of Depressive Symptoms

A critical finding in our study is that after implementation of systematic screening with the EPDS, there was a statistically significant increase in the detection of depressive symptoms during the first postpartum year. Our finding is consistent with a study that found that pediatricians recognize only 29% of mothers with high levels of depressive symptoms when relying solely on clinical indicators, suggesting that a screening tool may be useful in practice.³ The US Preventive Task Force noted that formal screening improves detection of depressed patients in primary care settings, and the benefits of screening likely outweigh the potential harm.⁷⁶ The increased detection is particularly important in light of the fact that completed EPDS forms were not recorded for more than half of the visits. We may infer that detection would be even greater if the EPDS were completed at 100% of the visits. Therefore, we strongly recommend that pediatricians consider implementation of a standardized depression screening tool for improving the detection of depression during this high-risk postpartum time.

Whether screening should occur at each well-child visit in the first year or only during specific visits is not yet established. For answering this question, larger sample sizes and randomized controlled studies of screening instruments at each well-child visit are needed. Our study was limited by its small sample sizes at each well-child visit, by its design with a historical rather than randomized control group, and by the fact that the EPDS has not been validated throughout the postpartum year. However, our findings suggest that the use of a standardized tool increases the detection of women with high depressive symptoms throughout the year. With detection rates between 6% and 14% at each well-child visit, screening mothers at >1 point in the postpartum year is needed to detect new cases. Whether to use the EPDS or another screening tool has not yet been established. Studies to validate screening tools, including the EPDS, throughout the postpartum year are needed.

A critical finding with regard to documentation of detection is that despite an increase in documentation of high depressive symptoms with the EPDS, there was not a statistically significant increase in documentation in the well-child visit form. Specifically, 19 visits included EPDS scores with high depressive symptoms but fewer than half ($n = 8$) included documentation in the well-child form. The lack of documentation was not limited to possible "borderline scores" (ie, 10–11; Table 2). The lack of documentation in the well-child visit form is important because it is the only indication that the clinician has addressed the EPDS score with the mother and determined a course of action, such as a referral for mental health assessment, a decision to monitor the mother's symptoms, or that no additional action is required. Regardless, chart documentation of the discussion and clinical decision is warranted. These issues may be corrected with internal reviews and a quality improvement plan, such as educating pro-

viders about documentation and ensuring that they actually review the EPDS during the visit. Since this study, the practice has proposed to add a space on each standardized well-child care form for the EPDS score and any outcome.

Referrals

Referrals to social work for mental health reasons increased significantly after initiation of standardized screening. It is likely that the increase is directly related to the use of the EPDS as all of the women who were referred for mental health purposes had scores ≥ 10 . This finding is consistent with qualitative feedback from social workers who noted that providers more explicitly state their reasons for mental health referrals to social work. Although this increase is promising, there were no referrals to social work noted in half of the mothers who had high EPDS scores. We found only 1 case in which the provider directly referred the mother to mental health services and depression was not documented in that case. Therefore, we cannot conclude from the documentation whether the 8 women were referred elsewhere for their depressive symptoms, were not referred, or were clinically assessed and determined to not need a referral. Evaluation of the referral process must be conducted to understand better this discrepancy. Because the study was a retrospective infant medical record review, we did not have information regarding maternal follow-up or treatment, thus limiting our ability to comment on the effectiveness of detection of depressive symptoms.

Strengths and Limitations

With regard to feasibility, the primary strength is that the study was conducted in a real-world busy pediatric practice. An important limitation is that it was conducted in only 1 pediatric practice, which was situated in an academic medical center. Because this practice has social workers on-site and a comprehensive psychiatric emergency program in the hospital, pediatricians in this practice may be more comfortable administering a standardized tool that detects depression than pediatricians in other practice settings. Generalizability to other types of practice settings needs additional study.

Another limitation is that we did not quantify the burden on the practice. For example, we did not assess whether the use of the screening tool lengthened the visits. Focus groups or a survey of mothers and providers would be useful in addressing perceptions of the use of this tool at well-child visits.

The small sample size limited our ability to perform multivariate analyses of independent associations of the outcomes with demographic characteristics and may not have been sufficient to produce statistically significant differences in the comparison of point prevalence at each well-child visit. A retrospective study using medical records is also limited by the incomplete data of the medical records and the variability of documentation by multiple providers. Finally, we cannot comment on whether the prevalence or detection of high levels of depressive symptoms among mothers who accompany their

children in the postpartum year is similar to or different from mothers who accompany older children as we do not have baseline rates among mothers in this clinic.

CONCLUSION

Mothers who experience high levels of postpartum depressive symptoms are common in an urban pediatric practice and can be detected at well-child visits throughout the first postpartum year by pediatricians using a standardized screening tool. This study highlights the potential for initiating and evaluating standardized universal screening for postpartum depression in pediatric or family physician practices throughout the first year of an infant's life. Pediatricians can play an important role in its detection and can assist mothers in seeking appropriate help, potentially improving their lives and the lives of their children.

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