The Mental Health Characteristics of Pregnant Women With Depressive Symptoms Identified by the Edinburgh Postnatal Depression Scale

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ABSTRACT

Objective: Few studies are available on the effectiveness of screening tools such as the Edinburgh Postnatal Depression Scale (EPDS) in pregnancy or the extent to which such tools may identify women with mental disorders other than depression. We therefore aimed to investigate the mental health characteristics of pregnant women who screen positive on the EPDS.

Method: Consecutive women receiving antenatal care in primary care clinics (from November 2006 to July 2011) were invited to complete the EPDS in week 16 of pregnancy. All women who scored above 11 (screen positive) on the EPDS and randomly selected women who scored below 12 (screen negative) were invited to participate in a psychiatric diagnostic interview.

Results: 2,411 women completed the EPDS. Two hundred thirty-three women (9.7%) were screened positive in week 16, of whom 153 (66%) agreed to a psychiatric diagnostic interview. Forty-eight women (31.4%) were diagnosed with major depressive disorder according to *DSM-IV* criteria, 20 (13.1%) with bipolar disorder, 93 (60.8%) with anxiety disorders (including 27 [17.6%] with obsessive-compulsive disorder [OCD]), 8 (5.2%) with dysthymia, 18 (11.8%) with somatoform disorder, 3 (2%) with an eating disorder, and 7 (4.6%) with current substance abuse. Women who screened positive were significantly more likely to have psychosocial risk factors, including being unemployed ($\chi^2_1 = 23.37$, $P \leq .001$), lower educational status ($\chi^2_1 = 31.68$, $P \leq .001$), and a history of partner violence ($\chi^2_1 = 10.30$, $P \leq 001$), compared with the women who screened negative.

Conclusions: Use of the EPDS early in the second trimester of pregnancy identifies a substantial number of women with potentially serious mental disorders other than depression, including bipolar disorder, OCD, and eating disorders. A comprehensive clinical assessment is therefore necessary following use of the EPDS during pregnancy to ensure that women who screen positive receive appropriate mental health management.

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In recent years, it has been increasingly recognized that depression in pregnancy may be an important predictor of long-term mental health outcomes in both the mother and the child exposed in utero. Systematic reviews suggest a prevalence rate of antenatal depression of around 12%–13%,[1,2] and there is now growing evidence that depression during pregnancy is associated with low birth weight and prematurity,[3] perinatal death,[4] sudden infant death syndrome,[5] and adverse mental health outcomes for the child that was exposed in utero.[6,7] Moreover, antenatal depression is often a predictor of postpartum depression, which is also independently associated with adverse cognitive and behavioral child outcomes.[2,8,9] In view of this evidence, some international guidelines are now advocating identification of depression in pregnancy (eg, "Antenatal and Postnatal Mental Health," by National Institute for Health and Care Excellence [NICE],[10] and "Management of Perinatal Mood Disorders," by Scottish Intercollegiate Guidelines Network [SIGN][11]), although there is considerable debate on how and when this should be done.[12]

The most widely studied instrument for screening depression during pregnancy is the Edinburgh Postnatal Depression Scale (EPDS),[13] which was originally designed to screen for postpartum depression. It has been validated for both postpartum depression[13–15] and depression during pregnancy,[15–18] with low positive predictive values consistently reported.[16–21] Rowe et al[22] pointed out that women scoring high on the EPDS without meeting diagnostic criteria for depression may be experiencing anxiety rather than depression, as it is known that the EPDS identifies anxiety symptoms.[23–26] A recent study[27] examining the diagnostic profiles of postpartum women also highlighted that a significant proportion of women who screened positive on the EPDS actually had bipolar disorder. However, the extent to which *pregnant* women who screen positive on the EPDS actually have serious mental disorders other than depression is not known. We therefore aimed in this study to investigate the mental health characteristics of women who screen positive for depression with the EPDS during pregnancy.

METHOD

Participants

Women attending antenatal clinics at 11 primary health care centers in Iceland (from November 2006 to July 2011) were approached and invited to participate in the study. Ten clinics were located in the capital region (the Greater Reykjavik area), and 1 clinic was located in Iceland's second largest urban area, Akureyri. Inclusion criteria were being pregnant, being at least 16 years of age, and being able to read and speak Icelandic language. Exclusion criteria were schizophrenia, acute psychotic symptoms, and significantly impaired cognitive functioning as identified by health care center staff. In total, 2,411

Clinical Points

- Comprehensive clinical assessment is necessary for women who screen positive on the Edinburgh Postnatal Depression Scale (EPDS) during pregnancy.
- Clinicians should not assume an absence of mental disorder if a woman screens negative on the EPDS during pregnancy.
- Women who screen positive on the EPDS have a higher likelihood of psychosocial vulnerability; such comorbidity may be associated with adverse outcomes, even if there is no maternal mental disorder in pregnancy.

pregnant women completed the EPDS in week 16 of the prenatal period (mean age = 28.88 years, SD = 5.26 [range, 17–47]).

Procedure

At weeks 12 to 14 of gestation, women attending prenatal examination were asked to participate in a study of mental health in the perinatal period. Women who agreed to participate were asked to complete the EPDS 3 times during pregnancy (weeks 16, 25, and 36) and once postpartum (between weeks 9 and 13). In this article, data from participants completing the EPDS in week 16 are reported. In week 16, pregnancy-related symptoms such as morning sickness, fatigue, and anxious thoughts about possible miscarriage are less frequent, making misdiagnosis less common. Recruitment of participants was carried out by midwives and nurses working in prenatal care under the supervision of an experienced clinical psychologist (L.B.L.).

If the women were found to have an EPDS score of 12 or higher (screen positive), they were contacted and asked to attend a psychiatric diagnostic interview within 2 to 4 weeks after screening. Women with a score of lower than 12 (screen negative) were randomly (1 in every 4) invited to participate in a diagnostic interview. Experienced female clinicians conducted the interviews using the Mini-International Neuropsychiatric Interview-Plus (MINI-Plus)[28] to diagnose the women according to *DSM-IV* criteria. Interviewers had clinical experience in distinguishing pregnancy-related symptoms from mental symptoms. Interrater reliability between the 2 main raters was high ($\kappa = 0.86$ [$P < .001$]; 95% CI, 0.75–0.97). Interviewers were blind to the participants' EPDS score.

Instruments

The EPDS[13] is a 10-item self-rating scale designed to screen for postpartum depression. The scale covers the most common symptoms of depression, without somatic symptoms such as fatigue and change in appetite, which may be expected both at postpartum and during pregnancy. Scoring for each item is from 0 to 3, with high scores indicating more symptoms of depression (ranging from 0 to 30). A cutoff score of ≥ 12 was chosen as previous research[16] supports the use of lower cutoff scores in pregnancy. The EPDS has been validated in both the postpartum and prenatal period and has good psychometric properties.[15,19]

The MINI-Plus is a standard diagnostic interview that contains 26 modules for the major Axis I psychiatric disorders in *DSM-IV-TR* and *ICD-10*. The modules used in this research were major depressive episodes, dysthymia, suicidality, hypomanic and manic episodes, panic disorders, agoraphobia, social phobia, simple phobia, obsessive-compulsive disorder (OCD), posttraumatic stress disorder (PTSD), alcohol abuse and dependence, nonalcohol psychoactive substance use disorder, anorexia nervosa, bulimia nervosa, generalized anxiety disorder (GAD), somatization, hypochondriasis, and pain disorder. The MINI-Plus has acceptable test-retest and interrater reliability and has been validated against the SCID for *DSM-III-R* and the CIDI for *ICD-10*.[28,29] The rates of depressive and anxiety disorders can be significantly overestimated when using *DSM* symptom criteria in pregnancy[30]; therefore, the MINI-Plus was used as a semistructured interview allowing experienced clinicians to distinguish between symptoms of normal pregnancy and of major depression or anxiety disorders by asking probing questions.

Sociodemographic and clinical data, including age, marital status, educational level, employment status, financial status, use of tobacco, and receipt of mental health treatment, were also collected by the researchers.

Statistical Analysis

Data were entered into SPSS, version 21 (IBM Corp, Armonk, New York). Descriptive statistics were used to study the sociodemographic and clinical characteristics of the sample, with χ^2 tests to compare sociodemographic characteristics of screen positive and screen negative women.

Ethics

Approval for the study was received from the Icelandic National Bioethics Committee (reference number 05–107-S1) and the Icelandic Data Protection Authority, Reykjavik (reference number S2589). When pregnant women attended the antenatal clinics at the beginning of their pregnancy (weeks 12–16), they received information about the study given by the midwives, who also invited them to participate. If women agreed to participate, they signed an informed consent before participation. If the women were in need of psychiatric treatment, they were referred to appropriate treatment at Mental Health Services, Landspitali-The National University Hospital of Iceland, Reykjavik.

RESULTS

Of the 2,411 women completing screening instruments in week 16, a total of 233 (9.7%) scored 12 or higher on the EPDS, and of them, 153 (66% response rate) attended a psychiatric diagnostic interview 2 to 4 weeks later (screen positive group). A randomly selected sample of 324 of the screen negative women was asked to participate in a diagnostic interview, of whom 201 attended and completed questionnaires (62%

Table 1. Sociodemographic Characteristics of Women Who Screened Positive (n = 153) and Negative (n = 200) on the Edinburgh Postnatal Depression Scale (EPDS)

Characteristic	Positive Screen (EPDS score ≥ 12), n (%)	Negative Screen (EPDS score < 12), n (%)	χ^2
Married/cohabiting	129 (84)	190 (95)	10.31**
First child	63 (41)	81 (40)	NS
Disability pension/unemployed	45 (29)	19 (10)	23.37*
University or other higher education	60 (40)	128 (64)	31.68*
Perceived poor financial status	32 (21)	14 (7)	14.81*
Smoking during pregnancy	24 (16)	5 (3)	19.99*
Drinking during pregnancy	2 (1)	4 (2)	…
Antidepressant medication	20 (13)	7 (4)	11.34**
Mental health treatment	45 (30)	9 (5)	41.78*
Prior history of mental health treatment	105 (79)	57 (29)	56.76*
History of partner violence	37 (25)	23 (12)	10.30*
Current partner violence	7 (18)	2 (9)	…
Close family members with mental disorders	103 (75)	118 (61)	6.61***

*$P \leq .001$. **$P \leq .005$. ***$P \leq .05$.

response rate). One woman subsequently screened positive in week 36 and was removed from the screen negative group.

Sociodemographic Differences Between Screen Positive and Screen Negative Women

The screen positive women were more likely to be unemployed or on disability support, have lower educational status, perceive their financial status to be poor, smoke, be taking antidepressant medication, have currently or previously been receiving mental health treatment, have a history of being a victim of partner violence, and have a family history of mental illness compared with screen negative women. Screen negative women were more likely to be married or cohabiting (Table 1).

Diagnostic Profiles of Screen Positive Women

Of the 153 screen positive women, 48 (31.4%) were diagnosed with major depression. Of these, 37 (24.2%) were also diagnosed with comorbid anxiety disorders. Fifty-six women (36.6%) were diagnosed with anxiety disorders and no depression. Thus, in total, 93 screen positive women (60.8%) were diagnosed with anxiety disorders. A detailed analysis can be seen in Table 2. As can be seen, GAD was the most common anxiety disorder diagnosed, although a substantial proportion of women were diagnosed with social phobia, OCD, panic disorder, and agoraphobia (n = 27, 27, 26, and 26, respectively, [17.0%–17.6%]). Twenty-eight screen positive women (18.3%) were diagnosed with other mood disorders, of which 20 (13.1%) were diagnosed with bipolar disorder. Eighteen women (11.8%) in the screen positive group were diagnosed with somatoform disorder, of which 9 (5.9%) were diagnosed with hypochondriasis. A small number (n = 3, 2.0%) of women were diagnosed with eating disorders. Twenty-nine women (18.9%) in the screen positive group were also diagnosed with substance-related disorders, 7 (4.6%) of them with current substance abuse.

Table 2. Mental Disorders in Women Who Screened Positive on the Edinburgh Postnatal Depression Scale (EPDS) at 16 Weeks of Gestation (n = 153)

Disorder	n (%)	No Comorbid Depression, n (%)	Comorbid Depression, n (%)
Major depression	48 (31.4)	…	…
Other mood disorders			
Dysthymia	8 (5.2)	…	…
Bipolar I	3 (2.0)[a]	…	…
Bipolar II	17 (11.1)[a]	…	…
Anxiety disorders			
General anxiety	55 (36.0)	33 (21.6)	22 (14.4)
Social phobia	27 (17.6)	15 (9.8)	12 (7.8)
Obsessive-compulsive disorder	27 (17.6)	12 (7.8)	15 (9.8)
Panic disorder	26 (17.0)	12 (7.8)	14 (9.2)
Agoraphobia	26 (17.0)	13 (8.5)	13 (8.5)
Simple phobia	21 (13.7)	14 (9.1)	7 (4.6)
Posttraumatic stress disorder	7 (4.6)	1 (0.6)	6 (3.9)
Somatoform disorders			
Hypochondriasis	9 (5.9)	5 (3.3)	4 (2.6)
Pain disorder	6 (3.9)	2 (1.3)	4 (2.6)
Somatization	3 (2.0)	…	3 (2.0)
Eating disorders			
Bulimia nervosa	2 (1.3)	1 (0.6)	1 (0.6)
Anorexia nervosa	1 (0.7)	1 (0.7)	…
Substance abuse disorders			
History of alcohol abuse	21 (13.7)	13 (8.5)	8 (5.2)
History of drug abuse	21 (13.7)	13 (8.5)	8 (5.2)
Drug abuse in last 12 mo	7 (4.6)	6 (3.9)	1 (0.7)

[a]Three women diagnosed with bipolar I disorder and 8 women diagnosed with bipolar II disorder had a depressive episode at the time of interview.

Table 3. Mental Disorders in Women Who Screened Negative on the Edinburgh Postnatal Depression Scale (EPDS) (n = 200)

Disorder	n (%)	No Comorbid Depression, n (%)	Comorbid Depression, n (%)
Major depression	2 (1.0)	…	…
Other mood disorders			
Dysthymia	1 (0.5)	1 (0.5)	…
Bipolar II	2 (1.0)	2 (1.0)	…
Anxiety disorders			
General anxiety	6 (3.0)	4 (2.0)	2 (1.0)
Social phobia	7 (3.5)	7 (3.5)	…
Obsessive-compulsive disorder	5 (2.5)	5 (2.5)	…
Panic disorder	2 (1.0)	2 (1.0)	…
Agoraphobia	7 (3.5)	7 (3.5)	…
Somatoform disorders			
Pain disorder	4 (2.0)	4 (2.0)	…
Somatization	1 (0.5)	1 (0.5)	…
Substance abuse disorders			
History of alcohol abuse	4 (2.0)	4 (2.0)	…
History of drug abuse	5 (2.5)	5 (2.5)	…

Diagnostic Profiles of Screen Negative Women

Table 3 shows that of the 200 women in the screen negative group, 4 (2%) were diagnosed with major depression, of whom 2 were diagnosed with comorbid anxiety disorders (1%). Twenty-seven women (13.5%) were diagnosed with anxiety disorders, most frequently GAD. Three women (1.5%) were diagnosed with mood disorders other than major depression, and 5 (2.5%) were diagnosed with somatoform disorder. Nine (4.5%) were diagnosed with a history of

substance abuse. None of the women in the screen negative group had current substance abuse or eating disorders.

The Use of Psychotropic Medication

Twenty-six women were taking psychotropic medication. Two women were using benzodiazepines, 1 was using the atypical antipsychotic drug quetiapine, and 23 were using antidepressants. Sertraline (n = 7) and fluoxetine (n = 5) were the most common selective serotonin reuptake inhibitors used, with 2 women using paroxetine, 2 using citalopram, and 1 using escitalopram. One woman was using venlafaxine, a selective serotonin-norepinephrine reuptake inhibitor, and 1 was using amitriptyline, a tricyclic antidepressant. Four women did not remember the name of their antidepressant. Of the women using antidepressants, 6 were diagnosed with bipolar disorder (5 were depressed, 3 were diagnosed with comorbid anxiety disorders), 1 with dysthymia, 1 with major depression, 1 with comorbid major depression and bulimia nervosa, 1 with anorexia nervosa, and 7 with anxiety disorders (GAD, OCD, panic disorder, social anxiety, and simple phobia). Six women, 5 using antidepressants and 1 using quetiapine, were symptom-free when the diagnostic interview took place, but had been diagnosed with major depression when prescribed medication. Two women diagnosed with anxiety disorder were taking benzodiazepines.

DISCUSSION

We found that a considerable proportion of pregnant women who screened positive on the EPDS had serious mental disorders other than major depression, including GAD, OCD, bipolar disorder, and eating disorders; all these women needed interventions that differ from those required for depression. Women who had major depression also often had a comorbid mental disorder, particularly anxiety disorder. We also inevitably found that a substantial proportion of screen negative women actually had mental disorders, providing further confirmation of concern by other authors[31] that negative EPDS results may mislead maternity professionals. These findings therefore highlight the importance of not relying only on the EPDS, but rather using it as a starting point for a conversation between the midwife and the pregnant woman about her emotional well-being.[32] Qualitative research also suggests that women prefer talking about how they feel rather than solely completing the EPDS.[33]

A recent US study[27] reported that most (two-thirds) postpartum EPDS screen positive women were diagnosed with a mood disorder with comorbid anxiety. Our findings that more than half of the screen positive women were diagnosed with anxiety disorders suggest that anxiety may also be particularly prominent in pregnancy. We found generalized anxiety disorder to be the most common anxiety disorder diagnosed (36%) in the screen positive women, but around 17% of the screen positive women were diagnosed with OCD, panic disorder, social phobia, or agoraphobia. Although some studies have found no difference in the rates of anxiety disorders in pregnancy compared with other times in the lives of women of childbearing age,[34,35] the adverse influence of anxiety disorders during pregnancy is of concern.[36,37] Anxiety during pregnancy is a strong risk factor for postpartum depression,[9,38–40] even after controlling for depression during pregnancy,[36] and is likely to also increase the risk of other postpartum mental disorders.[41] Anxiety during pregnancy has been associated with adverse fetal and developmental consequences,[3] and there is some evidence that anxiety may be a stronger predictor of such outcomes than antenatal depression.[41] Accurate identification and treatment of anxiety disorders in pregnancy are therefore important in prevention of these adverse outcomes.

In this study, mental disorders other than major depression and anxiety disorders were also investigated. Around 17% of the screen positive women were diagnosed with mood disorders other than major depression. Of particular interest is that 13% of the screen positive women were diagnosed with bipolar disorders, many of whom were suffering from depressive episodes at the time of the interview. Bipolar disorder is a serious disorder that may have negative consequences in pregnant women if not detected and treated appropriately.[42] If women discontinue using mood stabilizers during pregnancy, the recurrence risk is twofold greater than for those who continue,[43] and use of antidepressants can lead to mania. No women diagnosed with bipolar disorders in our study were using mood stabilizers; 1 woman with bipolar I disorder and 5 with bipolar II disorder were taking serotonin specific reuptake inhibitor antidepressants, possibly reflecting underdetection and suboptimal management of bipolar disorder by clinicians.

Eight screen positive women (5.2%) in our study were diagnosed with dysthymia. Although few data have been reported on dysthymia in pregnancy, Field et al[44] have argued that it may have greater adverse effects on the fetus than a single episode of depression.

There appears to be minimal research into somatoform disorders in pregnancy, but we found diagnoses of hypochondriasis (n = 9, 5.9%), pain disorder (n = 6, 3.9%), and somatization (n = 3, 2%). Recognizing somatoform disorders in general is considered difficult to most professionals, thus making it even more challenging in the perinatal period. Usually a thorough physical examination must take place to rule out an underlying medical cause of the symptoms, which was not the case in our study. Thus, we must be careful in interpreting our results. Even so, we think that attention to somatoform disorders in the perinatal period is important, given that women with these disorders can be very demanding for those working in perinatal clinics.

Finally, we found that, compared to EPDS screen negative women, screen positive women had significantly more psychosocial vulnerabilities, many of which are associated with adverse outcomes for the fetus and mother, including partner violence,[45] smoking,[46] and poverty.[47] A high EPDS score, therefore, indicates the need for careful assessment

of psychosocial risk factors so that appropriate care can be offered, which may include domestic violence advocacy[48,49] and smoking cessation interventions.[46]

Limitations of this study include selection and measurement bias. The detection of anxiety disorders during pregnancy may be difficult, as women may feel anxious during pregnancy for specific pregnancy-related reasons, but clinicians carrying out the research interviews were experienced in relation to diagnosis of psychiatric disorders in general and diagnosis in pregnancy in particular. The MINI-Plus, which is a semistructured interview, allowed space for the clinicians to ask probing questions before confirming a diagnosis. Strengths include the nature of the sample—a general maternity population rather than a clinical population—with gold standard interview assessment conducted by experienced clinicians, making reliable diagnosis more likely.

In conclusion, use of the EPDS during pregnancy will identify many women with depression but may also identify women who have other serious mental disorders, including anxiety disorders, bipolar disorders, eating disorders, and somatoform disorders. However, screen positive scores also indicate a higher likelihood of psychosocial vulnerability; such comorbidity may be associated with adverse outcomes even if there is no maternal mental disorder in pregnancy. A comprehensive clinical assessment is therefore necessary of any woman screened positive in pregnancy to ensure that mental disorders requiring specialist treatment are identified. A negative screen does not rule out the possibility of a mental disorder, and maternity professionals should remain clinically sensitive to changes in a women's well-being.

Drug names: citalopram (Celexa and others), escitalopram (Lexapro and others), fluoxetine (Prozac and others), paroxetine (Paxil, Pexeva, and others), quetiapine (Seroquel and others), sertraline (Zoloft and others), venlafaxine (Effexor and others).

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Author contributions: Drs Olafsdottir and Sigurdsson, Ms Lydsdottir, and Mr Tyrfingsson conceived and designed the study. Ms Lydsdottir and Dr Olafsdottir collected data, and Ms Lydsdottir carried out the study analysis, interpretation, and writing of the manuscript. Drs Thome, Sigurdsson, and Howard advised on study analysis, interpretation, and drafting of the manuscript.

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