

Mental disorders and risk factors among pregnant women with depressive symptoms in Sweden—A case-control study

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Abstract

Introduction: Identification of pregnant women suffering from depression or other mental disorders is a challenge for antenatal caregivers. The purpose of this case-control study was to describe mental disorders and the risk factors for mental disorders in women with depressive symptoms assessed with the Edinburgh Postnatal Depression Scale during the first trimester and to compare them with pregnant women without depressive symptoms.

Material and methods: In total, 2271 women answered the Edinburgh Postnatal Depression Scale at the first antenatal visit with a midwife. An Edinburgh Postnatal Depression Scale score of 13 or higher was considered to be screen-positive and these women were further assessed. Screen-negative pregnant women, matched for age and parity, were chosen as controls.

Results: In total, 149 (6.6%) women were found to be screen-positive. The majority (126, 85%) had at least one mental disorder or risk factor for mental disorder, such as depression (36.0%), anxiety (14.8%), or severe fear of childbirth (20.8%). The screen-positive women were more often smokers (16.1% vs 1.3%), unemployed (19.9% vs 1.3%), or on sick leave (25.3% vs 14.1%) during pregnancy and more often used selective serotonin reuptake inhibitor during pregnancy (14.2% vs 2.7%) compared with the screen-negative women ($P < .001$). Among the screen-negative women ($n = 150$) only three (2%) presented with symptoms of depression during pregnancy.

Conclusions: The Edinburgh Postnatal Depression Scale seems to be a valuable screening tool to detect depressive symptoms as well as other mental disorders during early pregnancy.

KEYWORDS

depression, Edinburgh Postnatal Depression Scale, mental health, midwife, pregnancy

Abbreviations: EPDS, Edinburgh Postnatal Depression Scale; PRIME-MD, Primary Care Evaluation of Mental Disorders.

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1 | INTRODUCTION

While maternal and infant mortality is decreasing in the western world, mental disorders are becoming more frequent, especially among young women in general.¹ Depression occurs in around 12%-13% of all pregnant women, with even higher frequencies among high-risk women, for example, those with previous depression.²⁻⁴ Depression during pregnancy is associated with negative outcomes such as low birthweight, prematurity, and cognitive/behavioral problems for the child.^{5,6} In the antenatal care programs offered in Sweden, focus on the pregnant woman's mental health has become increasingly important. Antenatal health care was introduced to screen for somatic disorders such as diabetes and hypertension, which could threaten the pregnant woman's life. During the last two decades, screening for postpartum depression has been introduced in many antenatal and childcare settings. The National Swedish Board of Health and Welfare has recently stated that attention to pregnant women's mental health should be included in the antenatal healthcare programs, and treatment should be offered when needed.¹ Despite this fact, screening for depression during pregnancy has not been introduced on a national level. The American College of Obstetricians and Gynecologists states that it is important to identify pregnant and postpartum women with depression because untreated perinatal depression and other mood disorders can have devastating effects on women, infants, and families. They further recommend that clinicians screen patients at least once during the perinatal period for depression and anxiety symptoms using a standardized, validated tool.⁷

International guidelines of the National Institute for Health and Care Excellence recommend that four routine questions should be asked of all pregnant women attending antenatal care in order to detect depression or anxiety: "During the past month have you often been bothered by feeling down, depressed or hopeless? During the past month, have you often been bothered by having little interest or pleasure in doing things? During the past month, have you been feeling nervous, anxious, or on edge? During the past month have you not been able to stop or control worrying?"^{8,9} The first two questions, also known as the Whooley questions, have been shown to have the same diagnostic accuracy as the Edinburgh Postnatal Depression Scale (EPDS). However, the EPDS is the most used and studied screening tool for the detection of depression during the childbearing period of life.^{9,10} The EPDS rates the intensity of depressive symptoms during the previous 7 days and has been validated during pregnancy and postnatally in Swedish pregnant populations.¹¹⁻¹⁴

Previous studies have shown a high comorbidity between symptoms of depression, both during pregnancy and postpartum, with other mental disorders (eg anxiety, post-traumatic stress disorder, and personality disorders).^{15,16} There are data showing the need to use screening instruments specifically for diagnoses other than depression, such as instruments screening specifically for anxiety disorders, in the pregnant population.¹⁷⁻¹⁹ However, screening with the EPDS may detect other mental disorders as well as symptoms of depression.²⁰

In 2012, the department of obstetrics and gynecology received an assignment from the county council of Östergötland, Sweden, to

Key message

The majority of pregnant women with an Edinburgh Postnatal Depression Scale score ≥ 13 reported one or more mental disorders or risk factors for mental disorders. EPDS is a screening tool useful to detect and increase the awareness of mental disorders.

implement screening for antenatal depression in early pregnancy and to study the occurrence of mental disorders among the screen-positive/negative women as part of the antenatal healthcare program.

The aim was therefore to describe mental disorders and risk factors for mental disorders identified in women with depressive symptoms during the first trimester and to compare them with pregnant women without depressive symptoms on the EPDS.

2 | MATERIAL AND METHODS

2.1 | Participants

Although the Swedish antenatal healthcare system is optional, it reaches almost 100% of pregnant women and provides, on average, eight visits during pregnancy. Pregnant women attending the antenatal care clinic in Linköping during the year 2013 were asked in the first trimester, ie gestational week $<14^{+0}$, by their midwife to answer the EPDS. All pregnant women over the age of 18 years and who could read and speak Swedish were approached. In total, 2271 women answered the questionnaire. The midwife informed the woman about the purpose of the screening and the results on the EPDS. If a woman was found to have an EPDS score of ≥ 13 , or any indication of thoughts of harming herself (scoring one to three points on item 10 on the EPDS while having a total score <13) she was considered to be screen-positive.¹⁴ A referral was made by the midwife for an appointment to either a psychotherapist or a psychologist at the psychosocial unit of the department of obstetrics and gynecology within 10 days.

The screen-positive women were evaluated using the Primary Care Evaluation of Mental Disorders (PRIME-MD) tool, and during the appointment the women's medical records were available. During the visit the women were also asked questions concerning psychosocial risk factors such as substance and/or alcohol misuse, partner abuse, financial problems, and long-term unemployment. Serious life events were defined as death of a close relative or experience of a life-threatening trauma. Risk factors for mental disorders related to stress included sleep disturbances or problems with coping in normal life due to having a heavy workload. If a woman scored ≤ 12 on the EPDS she was considered to be screen-negative. The first 150 women fulfilling the criteria to be screen-negative and with the same age and parity as the previous screen-positive woman were chosen as the control group. These women were not interviewed to

capture possible mental disorders, but their medical records, covering the complete pregnancy, were scrutinized in the same way as those of the screen-positive women (procedure for extraction of data is described below).

All data related to the pregnancy and mental health, among both index women as well as control women, was registered in the standardized Swedish antenatal and delivery records by the midwife and obstetricians. The data were manually extracted from the records by two of the authors. The following data were collected: age, smoking (yes/no), parity (0, ≥ 1), body mass index (≤ 24.9 kg/m², 25.0-29.9 kg/m², ≥ 30.0 kg/m²), sick leave (yes/no), and unemployment during pregnancy (yes/no). Information was also obtained from these medical records on diagnosed current mental disorder or risk factors for mental disorders defined in this study as depression disorder, anxiety disorder, personality disorders, attention deficit hyperactivity disorder, severe fear of childbirth, eating disorder, personality disorder, and use of selective serotonin reuptake inhibitor. Serious life events, psychosocial risk factors, previous depression, and symptoms of stress were also noted.

2.2 | Instruments

The EPDS is a 10-item self-report scale specifically designed to screen for postnatal depression in community samples, and was developed by Cox et al.¹⁰ Each item is scored on a four-point scale from 0 to 3; high scores indicate more symptoms of depression. When using >12 as a cut-off level, Cox et al showed a sensitivity of 86%, a specificity of 78% and a positive predictive value of 73% for major depressive illness postpartum.¹⁰ Another validation of the EPDS by Murray and Carothers, who also used a cut-off level of >12 , showed a sensitivity of 68%, a specificity of 96% and a positive predictive value of 67% for both major and minor depressive illness postpartum.¹¹ Validation of the Swedish version of the EPDS has been conducted and the findings were identical with, or similar to, those from earlier studies.¹² The EPDS can also be used as a valid measure of dysphoria through the various stages of pregnancy with the optimal cut-off of score ≥ 13 for detecting depression, giving a sensitivity of 77% and specificity of 94%.¹⁴

The EPDS should be considered as a screening tool and not a diagnostic instrument.

PRIME-MD is a psychiatric structured diagnostic interview designed for primary health care where the items are derived from the American Psychiatric Association's Diagnostic and Statistical Manual of Mental disorders, 4th edition (DSM-IV).²⁰

2.3 | Statistical analyses

Data were entered into SPSS, version 23 (IBM Inc., Armonk, NY, USA). Statistical significance was defined as two-sided values of $P < .05$. When comparing women with and without depressive symptoms the *t* test for quantitative variables with approximately normal distribution was used. The assumption of approximate

normal distribution was evaluated using the Kolmogorov-Smirnoff statistical analysis. Chi-squared tests were used when analyzing the categorical variables. However, when cell counts were lower than five, Fisher's exact test was used. Information on mental disorders during pregnancy was collected from medical charts among the controls, whereas among the cases this information was obtained in the PRIME-MD. Because of the low number of women with mental health disorders among the screen-negative women, multiple logistic regression models estimating the odds ratio for each mental health disorder, adjusting for the sociodemographic factors presented in Table 1, were not feasible.

2.4 | Ethical Approval

The present study was approved by the Ethical Review Board in Linköping, Dnr 2017/585-31 on 5 February 2018. Written informed consent for use of patient records in research was not required according to the Swedish Ethics Committee standards.

3 | RESULTS

Of the 2271 pregnant women who were assessed with the EPDS during the first trimester a total of 149 (6.6%) scored 13 or higher and were therefore considered to be screen-positive.

TABLE 1 Background data of the study population

	Screen-positive N = 149	Screen-negative N = 150	P value
	n (%)	n (%)	
Age (years), mean (SD)	29.93 (5.64)	30.21 (5.21)	.663*
Smoking			<.001**
Yes	24 (16.1)	2 (1.3)	
No	125 (83.9)	148 (98.7)	
Parity			.957***
0	70 (47.0)	70 (53.3)	
≥ 1	79 (53.0)	80 (46.7)	
BMI (kg/m ²)			.084***
≤ 24.9	86 (59.7)	100 (66.7)	
25-29	33 (22.9)	37 (24.7)	
≥ 30	25 (17.4)	13 (8.7)	
Sick leave/unemployment during pregnancy			<.001***
Yes	37 (25.3)	21 (14.1)	
No	80 (54.8)	126 (84.6)	
Unemployment	29 (19.9)	2 (1.3)	

*Student's *t* test.

***P* value for Fischer's exact test.

****P* value for chi-squared test.

TABLE 2 Psychiatric data for the 299 included women

	Screen-positive N = 149	Screen-negative N = 150	P value
	n (%)	n (%)	
Depression disorder during pregnancy			<.001**
Yes	54 (36.0)	3 (2.0)	
No	95 (64.0)	147 (98.0)	
Anxiety disorder during pregnancy			<.001*
Yes	22 (14.8)	7 (4.7)	
No	127 (85.2)	143 (95.3)	
Severe fear of childbirth			<.001*
Yes	31 (20.8)	5 (3.3)	
No	118 (79.2)	145 (96.7)	
Use of SSRI during pregnancy			<.001**
Yes	21 (14.2)	4 (2.7)	
No	127 (85.8)	146 (97.3)	
Eating disorder			.986**
Yes	4 (2.7)	4 (2.7)	
No	145 (97.3)	145 (97.3)	

Note: A woman could have more than one diagnosis.

Abbreviation: SSRI, selective serotonin reuptake inhibitor.

*P value for chi-squared test.

**P value for Fischer's exact test.

Of the screen-positive women, 126 (85%) were diagnosed during the face-to-face interview with a current mental disorder or risk factor for mental disorders. The distribution of the background data is shown in Table 1. Screen-positive women were more often smokers ($P < .001$) and were to a higher extent unemployed during pregnancy, or on sick leave ($P < .001$) compared with the screen-negative women. Depression and anxiety during pregnancy as well as severe fear of childbirth were more common among the screen-positive women ($P < .001$). Three of the screen-negative women (2.0%) were diagnosed with depression during pregnancy according to the medical records (Table 2). Screen-positive women also used selective serotonin reuptake inhibitor more often than the controls ($P < .001$), but there was no difference between the groups concerning eating disorders (Table 2). Table 3 shows the mental disorders and risk factors for mental disorders among the screen-positive women. One woman was diagnosed with more than one mental disorder or risk factor for mental disorders.

Out of the 149 screen-positive women, 23 (15%) were not diagnosed with any current mental disorders. Moreover, among these 23 women, two had a history of previous depression, one had an anxiety disorder before the pregnancy and three of them were suffering from severe hyperemesis (data not shown). In Table 3, the possible combinations of mental disorders including risk factors for mental disorders among screen-positive women with and without clinical depression are also presented. The majority of the screen-positive women were treated at the antenatal care clinic by a psychotherapist or psychologist, whereas 19 (13%) of the women had contact with the psychiatric clinic (data not shown).

TABLE 3 Psychiatric disorders and risk factors for mental disorders during pregnancy among the screen-positive women

	N = 149 n (%)	With clinical depression	Without clinical depression	P value
		n = 54 n (%)	n = 95 n (%)	
Depression during pregnancy	54 (36.0)	NA	NA	NA
Anxiety disorder during pregnancy	22 (14.8)	16 (29.6)	6 (6.3)	<.001
Eating disorder	4 (2.7)	2 (3.7)	2 (2.1)	.621
Attention deficit hyperactivity disorder	13 (8.7)	6 (11.1)	7 (7.4)	.436
Personality disorders	3 (2.0)	2 (3.7)	1 (1.1)	.298
Previous depression	72 (48.0)	25 (46.3)	47 (49.5)	.709
Serious life events	28 (18.8)	6 (11.1)	22 (23.2)	.070
Psychosocial risk factors	32 (21.5)	10 (18.5)	22 (23.2)	.507
Stress-related problems	12 (8.0)	0 (0.0)	12 (12.6)	.004
Severe fear of childbirth	31 (20.7)	4 (7.4)	27 (28.4)	.003
No. of women with at least one diagnosis or risk factor for mental ill-health	126 (84.6)	52 (96.3)	74 (77.9)	<.001

4 | DISCUSSION

In this study, 6.6% of the women who answered the EPDS in early pregnancy were considered as screen-positive, which is similar to another recently published study.²¹ Among these women, 36% were diagnosed with depression during pregnancy and four out of 10 of these women had additional mental disorders or risk factors for mental disorders. During 2014, all the midwives in the county of Östergötland carried out registration in the Swedish Pregnancy Register²² of all women attending antenatal care, and recorded the results from the now implemented routine screening with the EPDS. Data showed that 5%-6% of the women were screen-positive and that the rate was higher in parts of the county with more psychosocial risk factors, which strengthens the results of our study. One-fifth of the pregnant women were not screened at all.² The reasons might be language barriers or that the women declined the screening.

Of the screen-positive women in our study, 85% had at least one current mental disorder or risk factor for mental disorders, although the majority of these women were found to have a combination of anxiety, attention deficit hyperactivity disorder, personality disorders, or risk factors for mental disorders even though depression was the most common condition. Women with depressive symptoms were also more prone to socio-economic disadvantages such as being on sick leave, unemployment and smoking.

One advantage is that screening with EPDS does not seem to miss many women with depression as only 2.0% of the screen-negative women were diagnosed with depression later during the pregnancy. This is consistent with another study, in which 2% of the women with a score <12 on the EPDS had a major depression.²³ Matthey et al also stated in their study that using 13 as a cut-off on the EPDS does not appear to result in women in need being missed.²⁴ However, as not all women with a possible requirement for extra care for mental disorders during pregnancy are detected when using the EPDS only once in early pregnancy, it is important for all caregivers in the antenatal setting to be able to conduct new assessments when needed, for example if the pregnant woman expresses sadness or shows other mental issues.

This study shows that the EPDS might be a helpful tool for the midwife or other caregivers in antenatal settings for identifying women in early pregnancy who are suffering from different types of mental disorders or risk factors for mental disorders. It has previously been shown that the detection rates of postnatal depression are lower, compared with the numbers expected, if only face-to-face questions concerning mood are asked by the health-care giver.²⁵ One might therefore presume that the use of the EPDS makes it easier to ask questions concerning mental disorders. Most pregnant women are receptive to being asked; they view screening as a positive experience and indeed prefer routine screening, as it does not have the stigma associated with targeted assessment.²⁶ When introducing the EPDS as a routine screening tool in an antenatal care setting the midwives and physicians need to be educated in how to interpret the results of the EPDS and how to take a broader mental health history. It is also of great importance to have

a well-established routine for further referrals for diagnostic interview and adequate treatment.

A potential weakness in this study is that the medical records sometimes lack information despite the high level of standardization. However, this problem exists in both groups. There is a possibility that some women were not screened by the midwife because of lack of time or deviation from the routine but as we have no information about this, it is impossible to know if this has affected the results. Also, only women who could read and speak Swedish were approached, which could diminish the generalizability of the study results.

Another limitation is that the screen-negative women were not interviewed, which could result in lack of important data. Nevertheless, as the medical records were scrutinized, mental disorders, current use of medication, and risk factors for mental disorders should have been noted by the antenatal care givers.

In Sweden there is an ongoing debate on whether antenatal screening for depression should be recommended and if so, how it should be done. A high EPDS score indicates the need for further investigation in order to make a correct diagnosis and to offer a suitable treatment.

EPDS covers common symptoms of depression but excludes somatic symptoms, such as fatigue and change in appetite due to factors such as hyperemesis, which may occur during pregnancy.¹⁰ There is no indication that somatic symptoms would result in many false-positive values on the EPDS as only three screen-positive women were suffering from severe hyperemesis as the only diagnosis in our study and even so, it is easy to identify the underlying cause. A number of the screen-positive women in our study had previous depression as the only identified risk factor for mental disorder and postpartum depression, and that is important to acknowledge and follow up.²¹ Also, the group of screen-positive women without any mental disorder and unnecessary extra attention from the midwife was small.

The EPDS is constructed for the detection of depressive symptoms but in this study, we have also shown that the presumption that EPDS scores >12 only indicate probable depression is an oversimplification. Of the screen-positive women, 72 (48%) were diagnosed with a mental disorder or risk factor for mental disorders other than depression, such as anxiety, severe fear of childbirth and serious life events. Another study supports that finding, in which 16% of the screen-positive women had only an anxiety disorder and were not depressed.¹⁷

Many countries have started different screening procedures during pregnancy to identify women with mental disorders. Different screening tools have been used and the EPDS is only one of them. Avalos et al state that their large retrospective study provides evidence for the benefit of a universal perinatal depression screening program regarding identification of depressive symptoms and improvement after treatment, especially in an integrated health-care system.²⁷

Evidence suggests that screening pregnant women for depression may reduce the prevalence of depression and increase rates of

remission and response to treatment.²⁸ In a Cochrane review from 2007, women who received psychosocial or psychological intervention were significantly less likely to develop postpartum depression compared with those receiving standard care.²⁹ In a newly published systematic review, O'Connor et al conclude that psychological interventions such as cognitive behavior therapy and interpersonal psychotherapy during pregnancy or after childbirth can reduce the risk for perinatal depression, especially for women with an increased risk of depression.³⁰

Increased awareness of mental disorders during pregnancy and an early intervention are therefore important, but further studies in a Swedish pregnant population are needed.

Consequences for the woman herself, the family, and especially the potential negative outcomes such as lower birthweight, preterm delivery, and later psychological and development disturbances for the child when the mother is suffering from mental disorders are well known and underline the need to take these problems seriously.

The women who were screen positive for depressive symptoms were found to have other mental disorders, showing the complexity of depression symptoms and their features.

Therefore the EPDS might be a valuable tool for the caregivers in antenatal care settings in order to increase their awareness of mental disorders among pregnant women.

5 | CONCLUSION

The EPDS seems to be a valuable screening tool to detect depressive symptoms as well as other mental disorders during early pregnancy. This study indicates that a high proportion (85%) of the women with an EPDS score of 13 or above reported one or more mental disorder or risk factor for mental disorders during early pregnancy. Additional antenatal care and adequate referral of the pregnant women when needed is suggested.

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CONFLICT OF INTEREST

None.

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