

# Anxiety Symptoms and Severity among Perinatal Women Screened for Depression with the Edinburgh Postnatal Depression Scale

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## Abstract

**Objectives:** Describe the prevalence of anxiety among perinatal women screened with the Edinburgh Postnatal Depression Scale (EPDS) and identify the proportion of women screening positive for depression only, anxiety only, and co-occurring anxiety/depression.

**Methods:** Routine screening for depression was offered to all clients at 5 rural Utah public health department clinics. The online EPDS screening was completed electronically at the clinic or on a smartphone or computer. The 3-question subscale within the EPDS provided a preliminary screen for anxiety.

**Results:** A total of 2008 completed the EPDS. The EPDS anxiety sub-scale had good reliability ( $\alpha = 0.841$ ). A total of 761 women screened positive on the EPDS scale (37.6%) and 516 screened positive on the anxiety sub-scale (25.7%). Among those with a positive EPDS score, 494 had co-occurring anxiety symptoms (64.9%), and 267 had depression symptoms alone (35.1%). Among those with a positive screen on the anxiety subscale, 22 had a negative overall EPDS score (4.3%). The difference in the proportion of Latinx women screening positive for anxiety  $n = 72$  (21.0%) compared with non-Latinx women  $n = 411$  (26.7%) was statistically significant.

**Conclusions:** Most women who screen positive on the EPDS also screen positive on the anxiety sub-scale. Among those with a positive anxiety screen, approximately 1 in 20 would have been missed based on their total EPDS score.

**Implications:** To provide more comprehensive perina-

tal mental health screening and subsequent care, it is helpful to consider the total EPDS score as well as the anxiety sub-scale.

## Introduction

Perinatal anxiety (PA) is a common feature of perinatal mood disorders and often co-occurs with perinatal depression, with 1 in 5 of women experiencing anxiety during pregnancy or postpartum.<sup>1</sup> Perinatal depression (PD) is one of the most common complications of pregnancy, occurring in approximately 1 in 7 pregnant women and in approximately 1 in 5 postpartum women. PD and anxiety are highly comorbid.<sup>2</sup> High rates of anxiety disorders among women with depression during the perinatal period have been documented.<sup>2-5</sup>

Screening perinatal women for depression is increasingly common, while a concurrent focus on identifying anxiety is less common. This is likely due to a lack of screening tools specific to perinatal anxiety (PA), despite the importance.<sup>1</sup> The Edinburgh Postnatal Depression Scale (EPDS) is a well-validated and widely-used screening tool for depression during the perinatal period.<sup>6</sup> The EPDS contains a 3-question anxiety subscale called EPDS-3A. Despite its availability and use, providers rarely evaluate the EPDS anxiety sub-scale scores independently due to limited studies, as well as mixed results of the validity of EPDS-3A in detecting perinatal anxiety.<sup>7</sup> However, identifying women with perinatal anxiety alone or co-occurring with perinatal depression is important in order to provide optimal care, as evidence-based approaches to treating women with anxiety and those with

co-occurring depression/anxiety can differ from the approaches for addressing depression alone, including pharmacological treatment.<sup>8,9</sup> Anxiety and depression are not identical emotional states, with anxiety being more associated with a future orientation and depression being more associated with past orientation.<sup>10</sup> Thus, a more precise understanding of perinatal women's mental health status will facilitate optimal care. The purpose of this study is to describe the prevalence of anxiety among perinatal Utah women screened with the EPDS and to identify the proportion of women screening positive for depression only, anxiety only, and co-occurring anxiety and depression.

## Methods

Routine screening for perinatal depression was offered to all pregnant and postpartum individuals receiving services (e.g., immunizations, WIC- Women, Infants, and Children food supplement program certification) at public health clinics in five rural public health districts in Utah, including Central, Southeast, Southwest, San Juan, and Tooele. This study was approved by the Institutional Review Board at the University of Utah (IRB\_00071041) and funded by the Utah Department of Health. The EPDS screenings were primarily completed during WIC certification clinic visits via an electronic tablet and the REDCap data management system survey tool. The EPDS survey was also available via a survey link, to be completed later at a time more convenient for clients. Women took the English-language survey at the public health clinic or used the survey link provided by the clinic to complete the survey later on their own device.

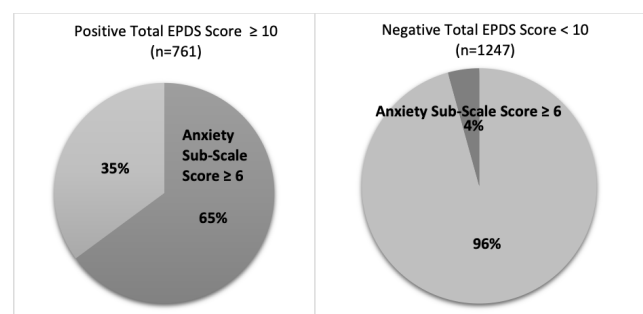
In addition to the EPDS screening tool, the REDCap survey included demographic questions, e.g., the individual's age, gestational age or postpartum weeks, ethnicity, language preference, insurance type, location of clinic, and race. Each item of the EPDS was rated on a 0 (No, never; No, not at all) to 3 (Yes, most of the time; very often; quite a lot) rating scale. A cutoff value of 11 on the EPDS has a sensitivity of 0.81 (0.75, 0.87 95% CI) and specificity of 0.88 (0.85, 0.91) to detect perinatal depression.<sup>11</sup> However, for this study, a cutoff value of 9 on the EPDS was selected to capture the greatest number of women with perinatal depression and anxiety, inclusive of mild symptomatology.<sup>11</sup>

The anxiety subscale (EPDS-3A) analyzes a latent construct found in responses to 3 questions in the EPDS instrument. The EPDS-3A sum of responses ranges from 0 to 9 with a cut off score of 6 suggesting symptoms of anxiety, and is unique from overall EPDS scores among childbearing women.<sup>12</sup> Factor analysis of the EPDS suggests potential value as a multi-dimensional tool, with three items forming a subscale measure for symptoms of anxiety: including *I have blamed myself unnecessarily when things went wrong, I have been anxious or worried for no good reason, I have felt scared or panicky for no good reason.*<sup>13</sup> The EPDS takes less than 5 minutes to complete.

## Results

A total of 2,008 women completed the EPDS screening between 2018-2020 and had complete data on the anxiety sub-scale (9 women had missing data on the subscale and were excluded from analysis). The population demographics are shown in Table 1. The EPDS total scale had excellent reliability ( $\alpha = 0.915$ ) while the anxiety sub-scale had good reliability ( $\alpha = 0.836$ ). Of the 2,008 women screened, 37.9% of women (N=761) screened positive for perinatal depression and 25.7% (N=516) screened positive on the EPDS anxiety sub-scale. Among the women who scored positive on the overall EPDS scale, 64.9% also scored positive on the EPDS anxiety sub-scale (see Figure 1). A total of 267 scored positive on EPDS overall but negative on the EPDS anxiety sub-scale (35.1%). Also, a total of 22 individuals scored positive on the EPDS anxiety sub-scale (4.3%) despite having a total EPDS of less than 10 (see Figure 1).

**Figure 1:** Edinburgh Postnatal Depression Scale (EPDS) Overall Scores and Proportion with Positive Anxiety Subscale



Out of 2008 women screened, 761 (37.9%) screened positive ( $\geq 10$ ) on the EPDS tool. Among all individuals who scored positive on the EPDS tool, 65% also scored positive on the anxiety sub-scale ( $\geq 6$ ). Among the 1247 individuals who screened negative on the EPDS, 49 (4%) screened positive on the anxiety subscale. In other words, 4% of women with anxiety alone would be missed if the only consideration is the total score of the EPDS.

We were also interested in evaluating any association between screening scores and ethnicity. Of the women that answered the ethnicity question (n=1,885), a lower proportion of Latinx women screened positive for EPDS overall (32.9%) compared with non-Latinx women (38.8%),  $\chi^2(1) = 4.157, p = 0.04$ . Similarly, the proportions of women screening positive for anxiety overall was lower among Latinx women (21.0%) compared with non-Latinx women (26.7%),  $\chi^2(1) = 4.721, p = 0.03$ .

Table 1 Demographics Table

Demographic Table		N = 2008	
		N	%
Age	Mean+-SD	26.3±5.9	
	Median (min, max)	26 [14, 57]	
Missing		58	
Age	Less than 24	856	42.6
	25 - 34	879	43.8
	35 - 44	210	10.5
	45 or older	5	0.2
	Missing	58	2.9
Pregnancy Status	Pregnant	594	29.6
	Postpartum	1033	51.4
Marital Status	Missing	381	19
	Single	673	33.5
	Married	927	46.2
	Living with Partner	334	16.6
	Divorced	55	2.7
Insurance type	Widowed	6	0.3
	Missing	13	0.6
	None	269	13.4
	Medicaid	1232	61.4
	Private/Group	370	18.4
Race	Other	123	6.1
	Missing	14	0.7
	American Indian or Alaskan Native	265	13.2
	Asian	12	0.6
	Black or African American	19	0.9
	Native Hawaiian or Other Pacific Islander	28	1.4
	White	1474	73.4
	From multiple races	50	2.5
Prefer not to answer	15	0.7	
Missing	92	4.6	
Unknown	53	2.6	

## Discussion

More than 1 in 3 women in the study screened positive for perinatal depression based on their overall EPDS score, and more than 1 in 4 had a positive screen on the EPDS anxiety sub-scale. Approximately two-thirds of women with a positive overall screen also had a positive anxiety sub-scale. Use of the EPDS 3A as well as the Hospital Anxiety and Depression Scale (HADS-A) to identify women with anxiety during late pregnancy,

and at 2 to 4 months postpartum, demonstrates that 28% of new mothers exhibit anxiety symptoms.<sup>16</sup> This is comparable to the prevalence of anxiety symptoms found in our study.

Among all women who screened positive on the anxiety sub-scale in the current study, approximately 4% would have been missed based on their total EPDS score (<9), indicating no symptoms of depression. This result is aligned with the work of Lautarescu et al., (2022) who found that between 1.9% to 3.38% of women with perinatal anxiety symptoms may have been missed because their total EPDS screen was negative (<13).<sup>15</sup> Another study found that the EPDS 3A identified an additional 2.5% of anxiety cases that would not have been detected using the total EPDS score alone.<sup>7</sup>

Studies suggest effectiveness in using the EPDS for detecting anxiety using the sub-scale. Smith-Nielsen et al. (2021) found that an EPDS 3A of over five was optimal for identifying anxiety (sensitivity: 70.9; specificity: 92.2; AUC: 0.926).<sup>7</sup> The authors concluded that the EPDS anxiety subscale may be a time-efficient screening tool for perinatal anxiety and can be used to identify both anxiety and depression.<sup>7</sup> Loyal et al. (2020) reported that the EPDS 3A has good internal consistency which is greater than or equal to 0.70. Furthermore, it was reported that the overall EPDS score was more strongly associated with the 3A anxiety scores than with the HADS-A anxiety scores, although the study concludes that further studies are needed to evaluate its validity during pregnancy. To assess validity of a 4-item EPDS anxiety subscale by comparing it to the Spielberger State-Trait Anxiety Inventory (STAI-6), van der Zee-van den Berg et al. (2019) included items 3,4,5, and 10 of the EPDS instrument, and reached a conclusion that the 4-item subscale does not provide adequate screening for anxiety compared to the STAI-6 in a community sample of postpartum women. They also concluded that the 4-item subscale may not allow discrimination between depression and anxiety compared to the STAI-6.<sup>17</sup> This finding is in alignment with our findings that the majority of women with symptoms of depression also had anxiety symptoms, while a small number were experiencing only anxiety symptoms without depression.

It is clear that perinatal women suffer from both anxiety and depression, and identifying women with each condition, as well as those with co-occurring anxiety

and depression, will help providers tailor care, interventions, and guidance to meet each individual's unique needs. Perinatal anxiety and depression are often treated with similar interventions, such as selective serotonin reuptake inhibitors and cognitive behavioral therapy, but women may need different resources and reassurance if they are experiencing both conditions, or experiencing anxiety alone.<sup>18</sup>

Our findings that non-Latinx women have higher rates of positive overall EPDS screens and anxiety sub-scale screens than Latinx women is aligned with the study of de la Rosa et al. (2021) reporting Latinx women were significantly less likely to report an EPDS score of 10 or above (8.6%) than non-Latinx women (20.5%).<sup>19</sup> Hartley et al., (2014) recommend using the total EPDS score and EPDS-3A to identify PD and PA in Latinx women but also recommend further validation studies.<sup>20</sup> In contrast, Liu & Tronic (2012) found that Latinx women experience higher levels of postpartum depressive symptoms than non-Hispanic white women.<sup>21</sup> Some studies suggest that stigma and social acceptability, as well as low rates of seeking care, are contributors to the differences in the documented diagnosis of depression among Latinx women, despite of the number of reliable screenings to detect PD.<sup>23</sup> Further studies are required to assess the meaning of lower score of EPDS in Latinx women compared to non-Latinx women. Our screening questions were only in English, which means findings may not be generalizable to Latinx women who do not speak English.

The strengths of our study include a large sample size and use of the EPDS, a widely used screening tool in healthcare settings. Limitations of the study include lack of an anxiety-specific comparison tool administered alongside the EPDS 3A subscale, such as the GAD-7. Additionally, study findings may not be generalizable to all perinatal women, as individuals completing the screening were all rural residents who

were visiting public health clinics that largely provide services to an underserved population. Future research comparing the EPDS-3A to other validated, reliable anxiety scales such as the GAD-7 is warranted. Furthermore, future studies could include evaluation of differences between Latinx and non-Latinx childbearing women, to better understand discrepancies.

## Health Implications

Consideration of the total EPDS score as well as scores on the anxiety sub-scale (or screening for both anxiety and depression with two separate scales) is important in providing more comprehensive perinatal mental health screening and care with appropriate guidance and resources. There is a high occurrence of PD and PA, and the EPDS is an efficient tool to screen and treat both anxiety and depression. However, future studies are required to assess validity of EPDS-3A compared to other anxiety scales. Utilizing the EPDS-3A can be a first step to identify the risk of perinatal anxiety and to initiate discussion about further screening or treatments of the symptoms. While more research will be required, the EPDS-3A sub-scale may be an efficient way to screen patients for anxiety at the same time as screening for depression, using only one screening tool.

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