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Original Research Article

Comparison of Edinburgh postnatal depression scale scores between high-risk pregnancy and normal pregnancy

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ABSTRACT

Background: Postpartum depression (PPD) is a significant perinatal mental health disorder with a reported prevalence of 8-20% globally. Obstetricians serve as the frontline clinicians best positioned to screen for PPD. However, universal screening remains inconsistently implemented in routine clinical practice. This study aimed to compare Edinburgh postnatal depression scale (EPDS) scores between women with high-risk pregnancies and those with normal pregnancies, and to identify specific high-risk subgroups that may warrant targeted screening.
Methods: A prospective analytical study was conducted between January 2020 and July 2021 in the department of obstetrics and gynecology at Vydehi Institute of Medical Sciences and Research Centre, Bengaluru. One hundred postpartum women were enrolled. The validated EPDS questionnaire was administered 72 hours post-delivery in a private setting. An EPDS score of ≥9 was used as the positive screening threshold. Statistical analysis employed unpaired t-tests and chi-square tests as appropriate.
Results: Of 100 women screened, 51 (51%) had an EPDS score of ≥9. Four variables were statistically significantly associated with a positive screen: employment status (47.1% employed vs. 18.4% housewife with EPDS≥9; p=0.002), lower gestational age (mean 37.37±3.50 weeks versus 38.46±1.38 weeks; p=0.043), neonatal NICU admission (27.5% versus 4.1%; p=0.001), and delayed breastfeeding initiation (33.3% versus 12.2%; p=0.012). Age, religion, educational status, duration of marriage, parity, mode of delivery, presence of comorbidities, neonatal gender, and birth weight did not demonstrate statistically significant associations.
Conclusions: Employed women, women who delivered preterm, mothers whose neonates required NICU admission, and those with delayed breastfeeding initiation demonstrated significantly higher EPDS scores. These groups should be prioritised for postpartum depression screening in clinical practice.

Keywords: Edinburgh postnatal depression scale, EPDS, High-risk pregnancy, Perinatal mental health, Postpartum depression, Postpartum screening

INTRODUCTION

Labour and childbirth represent one of the most profound physiological and psychological experiences in a woman's life. Beyond the classical triad of power, passage, and passenger, psychological wellbeing constitutes a fourth and often underappreciated dimension of the perinatal experience. Culture broadly construes childbirth as a joyful event; however, beneath this expectation lies a spectrum of perinatal mood disorders that can have serious and lasting consequences for the mother, neonate, and family unit.

The World Health Organization (WHO) defines postpartum depression (PPD) as a special state of mental health disorder and a variant of depression, while the

American Psychological Association (APA) characterises it as a serious mental health problem involving a prolonged period of emotional disturbance occurring at a time of major life change and heightened responsibility for the care of a newborn.[1] The diagnostic and statistical manual of mental disorders, fifth edition (DSM-5), recognises peripartum onset depression, which may begin during pregnancy or within four weeks of delivery, while the WHO International Classification of Diseases (ICD-10) extends this window to six weeks post-delivery.[2,3]

The global prevalence of PPD ranges from 8% to 20%, with significant variation depending on the population studied, the diagnostic criteria applied, and whether community or clinical settings were sampled.[4,5] In India, prevalence estimates from individual studies have ranged from 12% to as high as 32%.[6,7] The consequences of untreated PPD are wide-ranging, encompassing impaired maternal-infant bonding, disrupted breastfeeding, adverse infant growth and neurodevelopment, marital discord, and, in severe cases, suicidal ideation.[8-10]

The Edinburgh postnatal depression scale (EPDS), a 10-item validated self-report questionnaire first developed in 1987 by Cox, Holden, and Sagovsky, remains the most widely recommended and used screening tool for PPD worldwide.[11] It is available in over 50 languages, requires fewer than five minutes to complete, and demonstrates sensitivity ranging from 65% to 100% and specificity from 49% to 100%, depending on the cut-off applied.[11]

Despite the availability of this validated instrument, universal PPD screening remains inconsistently implemented in routine clinical practice, partly attributable to clinician workload and occupational burden. There exists, therefore, a clinical need to identify specific high-risk subgroups of postpartum women who may be particularly predisposed to PPD, enabling a more targeted and practical screening strategy. This study was designed to compare EPDS scores between women with high-risk pregnancies and those with normal pregnancies, and to determine which subgroups of patients are most likely to screen positive.

METHODS

Study design and setting

This was a prospective analytical study conducted in the department of obstetrics and gynecology at Vydehi Institute of Medical Sciences and Research Centre (VIMS and RC), Whitefield, Bengaluru, a tertiary care teaching hospital. The study period extended from January 2020 to July 2021.

Sample size

The sample size was calculated using the formula $n=2\sigma^2(Z_{1-\alpha/2} + Z_{1-\beta})^2/d^2$, where σ (standard deviation) =4.47, $Z_{1-\alpha/2}=1.96$ at 95% confidence level, $Z_{1-\beta}=0.84$ at 80% power, and d (clinically significant difference) =2.49. The minimum required sample size was determined to be 100 participants.

Participants

Postpartum women admitted to the in-patient department who met the following inclusion criteria were enrolled: age between 18 and 45 years, and delivery by vaginal, caesarean, or instrumental route at the study institution. Women who declined participation, those with a pre-existing diagnosis of psychiatric illness or intellectual disability, and women delivered elsewhere and referred only for postnatal management were excluded from the study.

Data collection and EPDS administration

Following institutional ethics committee approval and after obtaining written informed consent, baseline demographic and clinical data were recorded using a pre-designed proforma. At 72 hours post-delivery, each participant was administered the validated EPDS questionnaire in a private setting to ensure confidentiality. Where English was not the primary language, a validated translated version of the EPDS was used. The following variables were recorded and analysed: age, religion, educational status, husband's educational status, occupational status, duration of marriage, gestational age at delivery, parity, previous living issue, presence and number of medical comorbidities, mode of delivery, neonatal outcome (NICU admission versus rooming-in), neonatal sex, birth weight, and timing of breastfeeding initiation.

Screening threshold

An EPDS score of ≥9 was used as the positive screening threshold for postpartum depression, consistent with published literature supporting its use in the immediate postpartum period.[12]

Statistical analysis

Data were analysed using descriptive statistics (mean, standard deviation, and percentage). Continuous variables were compared between EPDS score groups using unpaired t-tests. Categorical variables were compared using the chi-square test. A p value of <0.05 was considered statistically significant.

RESULTS

Demographic and clinical profile

One hundred postpartum women were enrolled in the study. The demographic and clinical characteristics of the study population are summarised in Table 1. The majority of participants were in the 21-30-year age group, with a mean age of 26.11±4.3 years. The study population was

predominantly Hindu (93%), with 67% identifying as housewives and 31% as employed. Forty-five percent of women had attained primary-level education. Fifty-nine percent were primiparous. Forty-three percent had at least one medical comorbidity, the most common being thyroid disorders (34% of those with comorbidities), followed by diabetes mellitus (33%) and hypertension (16%). Eleven percent of women delivered preterm (<37 weeks of gestation), 16% had neonates requiring NICU admission, and 23% experienced delayed breastfeeding initiation.

Table 1: Demographic and clinical profile of the study population (n=100).

Characteristic	N (%)	Details
Age (years), mean±SD	26.11±4.3	Range 18-42
Religion- Hindu	93 (93)	
Occupation- employed	31 (31)	
Occupation- housewife	67 (67)	
Education- primary or less	47 (47)	
Duration of marriage >3 years	57 (57)	
Primipara	59 (59)	
Gestational age (weeks), mean±SD	37.90±2.6	Range 28-41
Preterm delivery (<37 weeks)	11 (11)	
Comorbidities present	43 (43)	DM, HTN, Thyroid, Asthma
Caesarean section	49 (49)	
NICU admission of neonate	16 (16)	
Delayed breastfeeding initiation	23 (23)	
EPDS score ≥9 (screen positive)	51 (51)	

DM- diabetes mellitus; HTN- hypertension; NICU- neonatal intensive care unit.

EPDS scores

Of the 100 women screened, 51 (51%) had an EPDS score of ≥9, indicating a positive screen for postpartum depression. The distribution of EPDS scores across the study population is presented in Table 2. Twenty-three percent scored in the mild risk category (9-11), 11% in the moderate risk category (12-13), and 17% in the high-risk category (≥14).

Table 2: Distribution of EPDS scores among participants (n=100).

EPDS score category	Number of patients	Percentage
≤8 (Screen negative)	49	49
9-11 (Mild risk)	23	23
12-13 (Moderate risk)	11	11
≥14 (High risk)	17	17
Total screen positive (≥9)	51	51

Factors significantly associated with EPDS≥9

Occupational status

Among employed women, 47.1% had an EPDS score of ≥9, compared with 18.4% of housewives. This difference was statistically significant (chi-square; p=0.002), indicating that employment status is a significant risk factor for postpartum depression in this study population (Table 3).

Table 3: Impact of occupational status on EPDS scores.

Occupational status	EPDS≤8 (n=49) (%)	EPDS≥9 (n=51) (%)	P value
Housewife	40 (81.6)	27 (52.9)	
Employed	9 (18.4)	24 (47.1)	0.002*

*Statistically significant (p<0.05); chi-square test.

Gestational age

Women who screened positive for PPD (EPDS≥9) had a significantly lower mean gestational age (37.37±3.50 weeks) compared with those who screened negative (38.46±1.38 weeks), with a statistically significant difference on unpaired t-test (p=0.043; Table 4). This finding supports the hypothesis that preterm delivery is associated with a higher risk of postpartum depression.

Table 4: Impact of gestational age on EPDS scores.

Parameter	EPDS≤8 (n=49)	EPDS≥9 (n=51)	P value
Gestational age (weeks), mean±SD	38.46±1.38	37.37±3.50	0.043*

*Statistically significant (p<0.05); unpaired t-test; SD-standard deviation.

Neonatal outcome (NICU admission)

Neonatal NICU admission emerged as a highly significant risk factor for PPD. Among women whose neonates were admitted to the NICU, 27.5% had an EPDS score of ≥9, compared with only 4.1% of those whose neonates were healthy (p=0.001; Table 5). This represents the strongest association observed in the study.

Table 5: Impact of neonatal outcome on EPDS scores.

Neonatal outcome	EPDS≤8 (n=49) (%)	EPDS≥9 (n=51) (%)	P value
Healthy neonate	47 (95.9)	37 (72.5)	
NICU admission	2 (4.1)	14 (27.5)	0.001*

*Statistically significant (p<0.05); chi-square test; NICU-neonatal intensive care unit.

Breastfeeding initiation

Delayed initiation of breastfeeding was significantly associated with a positive EPDS screen. Among women with delayed initiation, 33.3% had an EPDS score of ≥9, compared with 12.2% of those who initiated breastfeeding promptly (p=0.012; Table 6).

Table 6: Impact of breastfeeding initiation on EPDS scores.

Breastfeeding initiation	EPDS≤8 (n=49) (%)	EPDS≥9 (n=51) (%)	P value
Prompt initiation	43 (87.8)	34 (66.7)	
Delayed initiation	6 (12.2)	17 (33.3)	0.012*

*Statistically significant (p<0.05); chi-square test

Factors not significantly associated with EPDS score

Age (mean 25.69 years versus 26.50 years; p=0.345), religion (p=1.0), patient educational status (p=0.233), husband's educational status (p=0.165), duration of marriage (p=0.665), previous living issue (p=0.504), presence of comorbidities (p=0.1), number of comorbidities (p=0.60), mode of delivery (p=0.108), neonatal sex (p=0.84), and neonatal birth weight (mean 2.82 kg versus 2.73 kg; p=0.50) were not found to be statistically significantly associated with EPDS scores in this study.

DISCUSSION

This prospective study screened 100 postpartum women using the EPDS and identified a screen-positive rate of 51% using a threshold of ≥9. This figure is consistent with the range reported across Indian studies, which have documented prevalences between 12% and 87%, depending on the cut-off used and the population studied.[6,7,13] The relatively high screen-positive rate in this study may reflect both the sensitivity of the ≥9 cut-off and the mixed-risk composition of the study population.

Employment status

The finding that employed women were significantly more likely to screen positive for PPD (47.1% versus 18.4%; p=0.002) is corroborated by several studies. Anokye et al reported a significantly higher risk of PPD among employed women on both univariate (OR=8.21) and multivariate analysis (OR=4.72).[14] Similarly, Qianqian et al. demonstrated a significant association between employment and PPD (OR=3.48; p=0.02).[15] The dual burden of professional responsibilities alongside the demands of newborn care may contribute to heightened psychological stress in employed postpartum women. It is noteworthy that one contrary study by Katon et al. found unemployed women to be at higher risk, suggesting that the relationship between occupational status and PPD may be moderated by socioeconomic context.[16]

Gestational age and preterm delivery

Lower gestational age was significantly associated with higher EPDS scores (p=0.043). This finding aligns with Ihongbe and Masho, who demonstrated a 55% higher risk of PPD in women with a history of preterm birth compared to those with term deliveries.[17] Bener et al similarly reported that the risk of depression was twofold higher among mothers of preterm infants compared to mothers of term infants.[18] The emotional and logistical stressors associated with preterm delivery, including concerns about neonatal wellbeing and the uncertainty of the neonatal course, plausibly contribute to this elevated risk.

NICU admission

Neonatal NICU admission demonstrated the strongest and most statistically significant association with a positive EPDS screen in this study (27.5% versus 4.1%; p=0.001). El-Hachem et al similarly reported a significantly higher rate of PPD among mothers of neonates transferred to the ICU (EPDS>9: 18.7% versus 8.6%; p=0.02).[19] Hoedjes et al further noted that NICU admission of the neonate was an independent contributor to postpartum depression following preeclampsia.[20] The physical separation from the neonate, the prolonged hospital stay, and the anxiety inherent in observing intensive neonatal care are likely to exert a substantial psychological toll on new mothers.

Breastfeeding Initiation. Delayed breastfeeding initiation was significantly associated with a positive EPDS screen (33.3% versus 12.2%; p=0.012). The bidirectional relationship between PPD and breastfeeding is well-established in the literature. Sheela et al demonstrated a significant association between delayed breastfeeding initiation and an EPDS score of ≥13 (p=0.001).[21] Yahya et al reported that mothers at higher risk of depression were less likely to have a positive attitude towards breastfeeding

(OR=0.37; p=0.001).[22] The failure to initiate breastfeeding may compound maternal feelings of inadequacy and disconnection from the neonate, further amplifying psychological distress.

Factors not reaching statistical significance

Several variables that are reported as significant risk factors in other studies- including mode of delivery, presence of comorbidities, and neonatal sex- did not reach statistical significance in this study. This is likely attributable to the limited sample size of 100 participants, which was adequate for the primary analysis but insufficient to detect differences in individual subgroups of comorbidities. Nonetheless, the broader literature consistently supports comorbidities such as gestational diabetes, hypertension, and preeclampsia as significant risk factors for PPD, and clinicians should remain vigilant in these populations.[6,8,9,23]

The central practical implication of this study is that whilst universal PPD screening remains the ideal standard, targeted screening of the identified high-risk groups- employed women, women with preterm delivery, mothers with NICU-admitted neonates, and those with delayed breastfeeding- provides a pragmatic minimum standard where resource and time constraints limit universal application. The EPDS itself represents an efficient, validated, and widely available screening tool that is free of cost, takes fewer than five minutes to complete, and is available in over 50 languages including Indian vernacular translations.

CONCLUSION

This study demonstrates that employment status, lower gestational age, neonatal NICU admission, and delayed breastfeeding initiation are statistically significant risk factors for postpartum depression as measured by EPDS screening in the early postpartum period. Universal screening for PPD using the EPDS is recommended as the gold standard. Where universal screening is not feasible, these specific high-risk groups should be prioritised. Early identification and prompt referral for appropriate psychiatric or psychological support may substantially reduce the burden of PPD and its downstream consequences for the mother, neonate, and family.

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