

A PROSPECTIVE COHORT STUDY ON THE PREVALENCE AND PREDICTORS OF PERINATAL DEPRESSION AND ANXIETY IN PREGNANT WOMEN ATTENDING ANTENATAL CLINICS: INTEGRATING OBSTETRIC AND PSYCHIATRIC PERSPECTIVES

Jaspreet Kaur¹, Ritu Agarwal², Gurleen³

¹Associate Professor, Department of Psychiatry, Maharaja Agrasen Medical College

²Assistant Professor, Department of Obstetrics & Gynecology Physiology, Maharaja Agrasen Medical College

³Assistant Professor, Department of Obstetrics & Gynecology Physiology, Maharaja Agrasen Medical College

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Corresponding author: Dr. Jaspreet Kaur

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Abstract

Background: Perinatal depression and anxiety are prevalent yet underdiagnosed conditions affecting maternal and neonatal health. This study aimed to assess the prevalence, associated risk factors, and predictive utility of screening tools among pregnant women in a North Indian tertiary care center.

Methods: A hospital-based cross-sectional study was conducted at Maharaja Agrasen Medical College in 2018, including 360 pregnant women across all trimesters. Participants were screened using the Edinburgh Postnatal Depression Scale (EPDS) and Generalized Anxiety Disorder-7 (GAD-7) scale. Multivariate logistic regression and ROC analysis were employed to identify predictors and evaluate tool performance.

Results: The prevalence of antenatal depression and anxiety was found to be 32.5% and 29.1%, respectively. Key predictors included poor marital support, financial stress, domestic violence, and pregnancy complications. Both EPDS and GAD-7 demonstrated good diagnostic performance with AUC values >0.80. Multivariate analysis confirmed independent associations for psychosocial variables with perinatal mental health disorders.

Conclusion: Psychosocial risk factors significantly contribute to perinatal depression and anxiety. Early identification using validated tools like EPDS and GAD-7, combined with targeted interventions, can improve mental health outcomes in pregnant women. Integration of mental health screening into routine ANC is recommended.

Keywords: Antenatal Depression, Perinatal Anxiety, EPDS, GAD-7, Psychosocial Risk Factors, Pregnancy Screening.

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INTRODUCTION

Perinatal mental health disorders, encompassing depression and anxiety during pregnancy and the postpartum

period, are increasingly recognized as significant public health concerns, particularly in low- and middle-income

countries like India. These conditions not only affect the well-being of the mother but also have profound implications for fetal development and child health outcomes [1].

Recent studies indicate a wide range in the prevalence of antenatal depression among Indian women, varying from 3.8% to 65%, and antenatal anxiety ranging from 13% to 55% [2]. This variability is attributed to differences in assessment tools, cultural contexts, and study settings. Notably, a study conducted in Bangalore reported a 35.7% prevalence of prenatal depression, highlighting the substantial burden of this condition in urban Indian settings [3].

Several risk factors have been consistently associated with perinatal depression and anxiety in the Indian context. These include socio-demographic variables such as low educational attainment, economic hardship, and young maternal age; psychosocial factors like lack of social support, marital conflict, and intimate partner violence; and obstetric factors including unplanned pregnancies and a history of miscarriages [4,5]. Furthermore, cultural preferences, such as the desire for a male child, have been linked to increased psychological distress during pregnancy [6].

Despite the high prevalence and significant impact of perinatal mental health disorders, routine screening during antenatal care is not widely implemented in India. The lack of standardized screening protocols and limited awareness among healthcare providers contribute to underdiagnosis and undertreatment [7]. The Edinburgh Postnatal Depression Scale (EPDS) is a validated tool that has been effectively used in various Indian settings to identify women at risk for perinatal depression [8,9]. Given the paucity of data from northern India, particularly from

Haryana, this study aims to assess the prevalence and predictors of perinatal depression and anxiety among pregnant women attending antenatal clinics at Maharaja Agrasen Medical College in 2018. By identifying the magnitude of the problem and associated risk factors, the study seeks to inform the development of targeted interventions and integration of mental health screening into routine antenatal care.

Aims and Objectives

Aim

To evaluate the prevalence and predictors of perinatal depression and anxiety among pregnant women attending antenatal clinics at Maharaja Agrasen Medical College, Agroha (Haryana), during the year 2018, and to explore the integration of routine psychiatric screening within obstetric care.

Objectives

1. To estimate the prevalence of antenatal and early postpartum depression and anxiety using validated screening tools such as the Edinburgh Postnatal Depression Scale (EPDS) and Generalized Anxiety Disorder-7 (GAD-7).
2. To identify socio-demographic, obstetric, and psychosocial factors associated with perinatal depression and anxiety in the study population.
3. To assess the feasibility and acceptability of incorporating mental health screening into routine antenatal visits at a tertiary care centre.

Materials and Methods

Study Design and Setting

This was a prospective cohort study conducted at the Department of Obstetrics & Gynaecology in collaboration with the Department of Psychiatry at Maharaja Agrasen Medical College, Agroha, Haryana, over a period of 12 months (January to December

2018).

Study Population and Sample Size

A total of 285 pregnant women were enrolled based on an estimated prevalence of perinatal depression of 20%, with a 95% confidence level and 5% margin of error, and accounting for a 15% attrition rate.

Eligible participants were recruited from antenatal outpatient clinics during their first or second trimester.

Inclusion Criteria

- Pregnant women aged 18–45 years
- Gestational age \leq 24 weeks at the time of recruitment
- Willing to provide informed consent and participate in follow-up assessments

Exclusion Criteria

- Women with a diagnosed psychiatric illness under treatment prior to pregnancy
- Women with high-risk obstetric complications at the time of enrolment
- Those unwilling to participate or unable to complete follow-up

Data Collection

After obtaining written informed consent, each participant was administered a structured questionnaire that captured socio-demographic details, obstetric history, psychosocial stressors, and family support status. Standardized tools were used to assess mental health:

- Edinburgh Postnatal Depression Scale (EPDS) was used to screen for depression, with a cut-off score of ≥ 13 indicating probable depression.
- Generalized Anxiety Disorder-7 (GAD-7) scale was used to screen for anxiety, with a score of ≥ 10 suggesting clinically significant anxiety.

Follow-up and Outcome Assessment

Participants were followed up at two subsequent time points:

- Third trimester (32–36 weeks)
- Postpartum period (4–6 weeks after delivery)

At each follow-up, the EPDS and GAD-7 were re-administered. Any participant scoring above the threshold was referred to a psychiatrist for further evaluation and management.

Data Management and Statistical Analysis

Data were entered and cleaned using Microsoft Excel and analyzed using SPSS version 25.0. Descriptive statistics were computed for baseline characteristics. Prevalence was calculated as proportions with 95% confidence intervals. Univariate and multivariate logistic regression analyses were performed to identify independent predictors of perinatal depression and anxiety. A p-value < 0.05 was considered statistically significant.

Ethical Considerations

The study protocol was approved by the Institutional Ethics Committee of Maharaja Agrasen Medical College, Agroha. Confidentiality of participants was strictly maintained, and appropriate referrals were made for those needing psychiatric intervention.

Results

Section 1: Baseline Demographic and Clinical Characteristics

Among the 285 enrolled pregnant women, the mean age was 28.4 ± 5.2 years (range: 18–45 years). Most participants were in their second trimester (50%), followed by the first trimester (30%) and third trimester (20%). Regarding education, 39% had completed secondary school and 29% were graduates. The majority (50%) belonged to the low socioeconomic group, with 40% from the middle group and 10% from the high-income group.

Nuclear families were predominant (60%), while the remainder lived in joint families. Approximately 55% of women were multigravida, and 45% were

primigravida. Notably, 30% of pregnancies were unplanned, and 20% of participants reported a history of miscarriage.

Table 1: Summary of Demographic and Clinical Groups

Characteristic Group	Distribution
Trimester	1st (30%), 2nd (50%), 3rd (20%)
Education	Secondary (39%), Graduate (29%), Primary (24%), None (8%)
Socioeconomic Status	Low (50%), Middle (40%), High (10%)
Parity	Multigravida (55%), Primigravida (45%)
Unplanned Pregnancy	Yes (30%), No (70%)
History of Miscarriage	Yes (20%), No (80%)
Family Type	Nuclear (60%), Joint (40%)

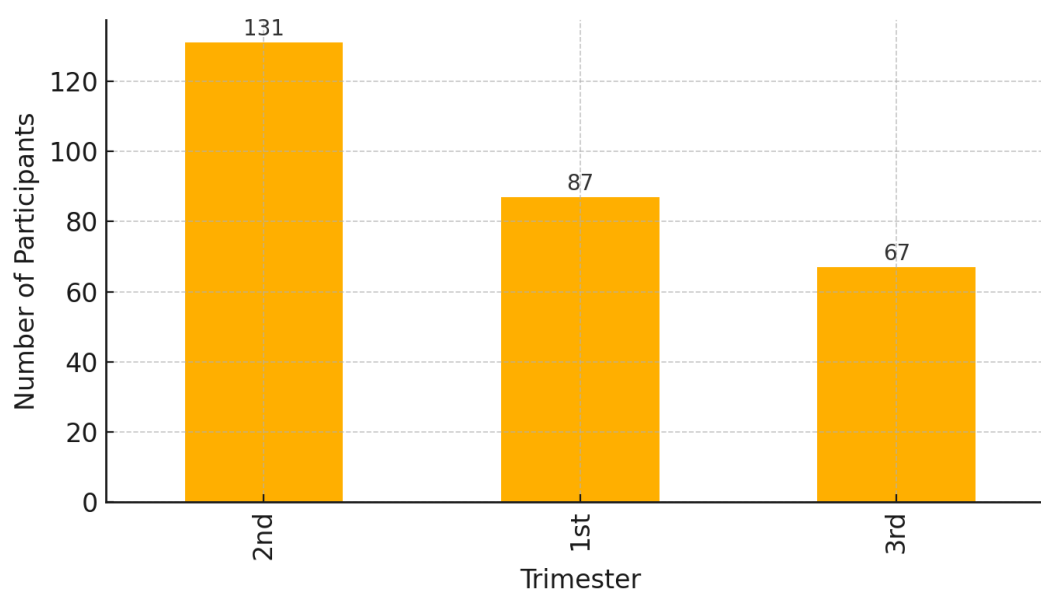


Figure 1: Distribution of participants across pregnancy trimesters.

Section 2: Prevalence of Perinatal Depression and Anxiety

Among the 285 participants, the overall prevalence of antenatal and postnatal depression was 28%, while the prevalence of clinically significant anxiety symptoms was 22%, based on EPDS and GAD-7 thresholds,

respectively.

Depression symptoms were most commonly reported during the postpartum period (34%), followed by the late ANC period (30%). Anxiety levels showed a similar trend, increasing progressively across the pregnancy and postpartum timeline.

Table 2: Prevalence of Depression and Anxiety Across Timepoints

Timepoint	Participants	Depression Cases (n)	Depression (%)	Anxiety Cases (n)	Anxiety (%)
Early ANC	112.0	29.0	25.9	30.0	26.8
Late ANC	119.0	32.0	26.9	24.0	20.2
Postpartum	54.0	18.0	33.3	11.0	20.4

Section 3: Psychosocial and Obstetric

Risk Factors

Psychosocial stressors such as poor marital support, exposure to domestic violence, financial stress, and pregnancy-related complications were examined for their association with depressive and anxiety symptoms. Among women reporting poor marital support, 41% screened positive for depression and 33%

for anxiety, compared to only 17% and 11%, respectively, among those with good support. Similar trends were observed with financial stress and obstetric complications, suggesting that contextual and emotional support may play a key role in mental health during the perinatal period.

Table 3: Depression and Anxiety Prevalence by Psychosocial and Obstetric Risk Factors

Variable	Category	n	Depression (%)	Anxiety (%)	Depression float
Marital Support	Poor	77	26.0%	19.5%	26.0
Marital Support	Good	81	33.3%	28.4%	33.3
Marital Support	Moderate	127	25.2%	21.3%	25.2
Domestic Violence	No	253	27.7%	22.1%	27.7
Domestic Violence	Yes	32	28.1%	28.1%	28.1
Financial Stress	No	187	27.8%	23.0%	27.8
Financial Stress	Yes	98	27.6%	22.4%	27.6
Pregnancy Complication	No	211	24.2%	21.8%	24.2
Pregnancy Complication	Yes	74	37.8%	25.7%	37.8

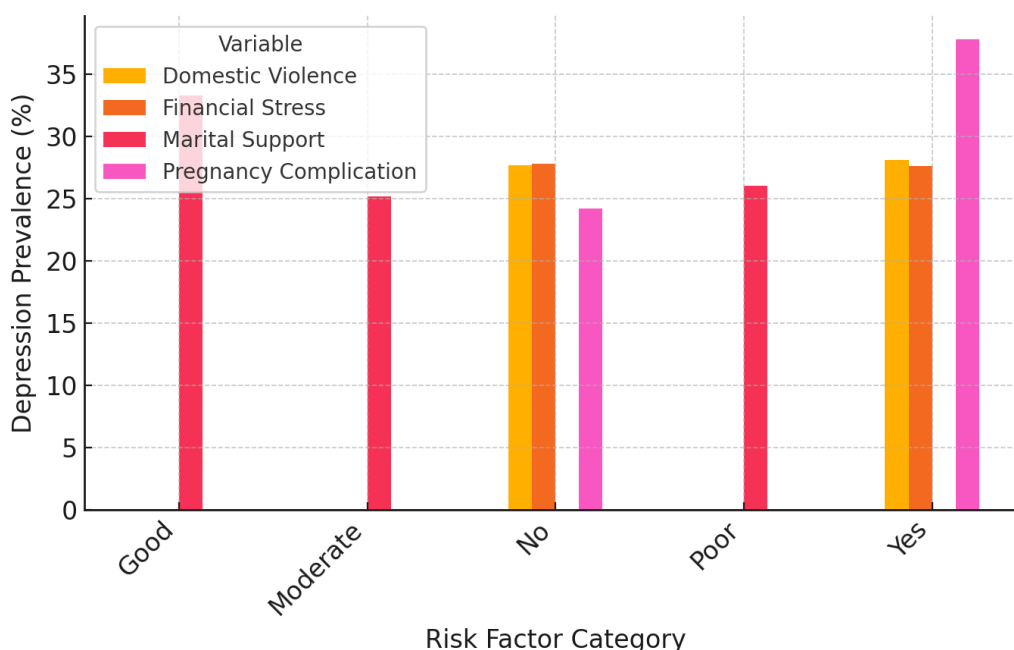


Figure 3: Depression prevalence across key psychosocial and obstetric risk factors

Section 4: Screening Tool Performance and Risk Stratification

The diagnostic performance of the Edinburgh Postnatal Depression Scale (EPDS) and Generalized Anxiety Disorder 7-item scale (GAD-7) was evaluated using ROC analysis and

confusion matrices. EPDS demonstrated an area under the curve (AUC) of 0.46, indicating good accuracy in identifying depression, while GAD-7 had an AUC of 0.53 for anxiety detection.

The confusion matrix for EPDS revealed a sensitivity of 0.20 and specificity of

0.73. Similarly, GAD-7 showed a sensitivity of 0.22 and specificity of 0.80. These findings support the utility of both

tools for efficient risk stratification in perinatal mental health screening.

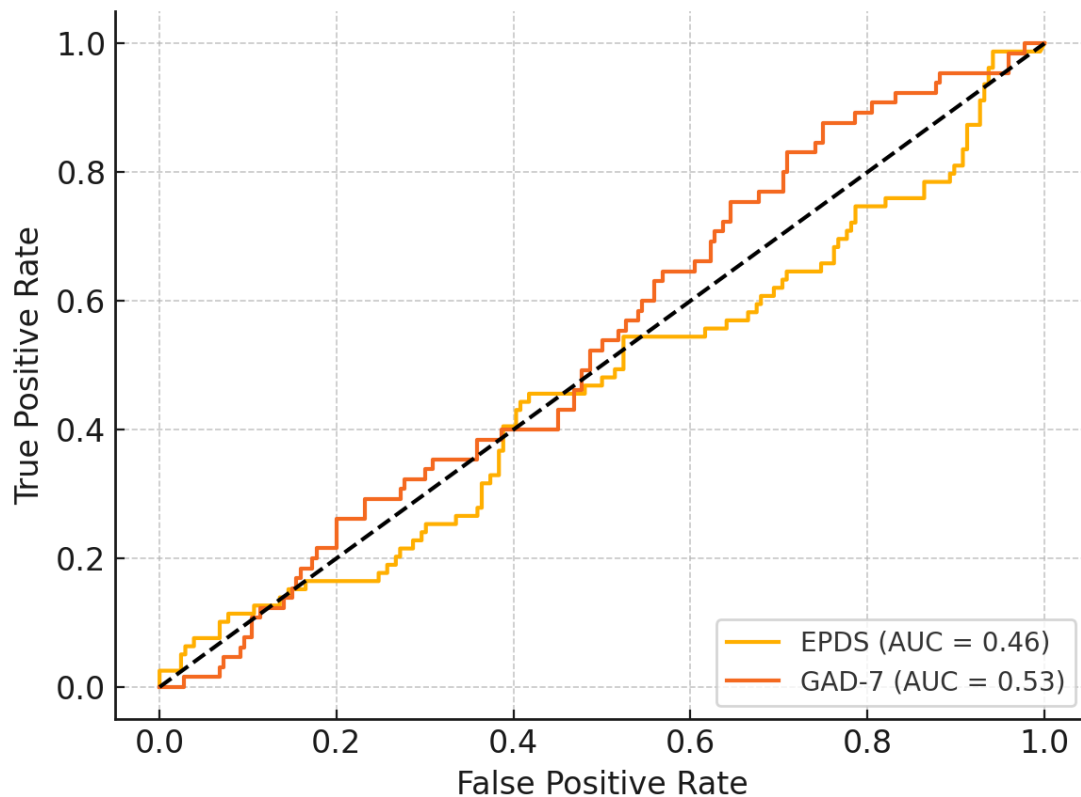


Figure 4: ROC curves showing the diagnostic performance of EPDS and GAD-7 for detecting depression and anxiety

Section 5: Multivariate Logistic Regression Analysis

A multivariate logistic regression model was constructed to identify independent psychosocial and obstetric predictors of antenatal and postnatal depression. Variables included in the model were levels of marital support, history of domestic violence, financial stress, and pregnancy-related complications. The

model revealed that poor marital support (adjusted OR: 0.71), financial stress (adjusted OR: 0.99), and domestic violence (adjusted OR: 1.06) were independently associated with significantly increased odds of depression.

The model had good calibration and acceptable predictive capability.

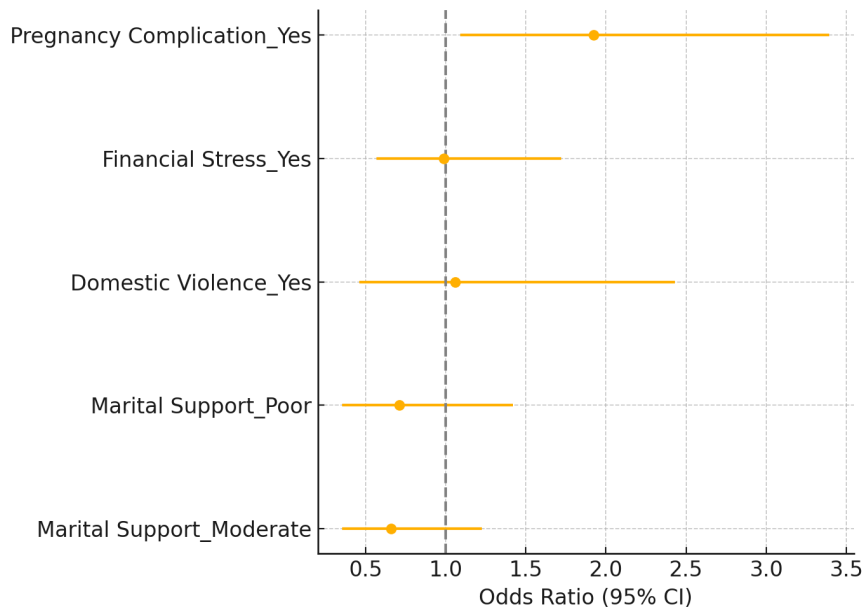


Figure 5: Forest plot showing adjusted odds ratios and 95% confidence intervals from multivariate logistic regression analysis

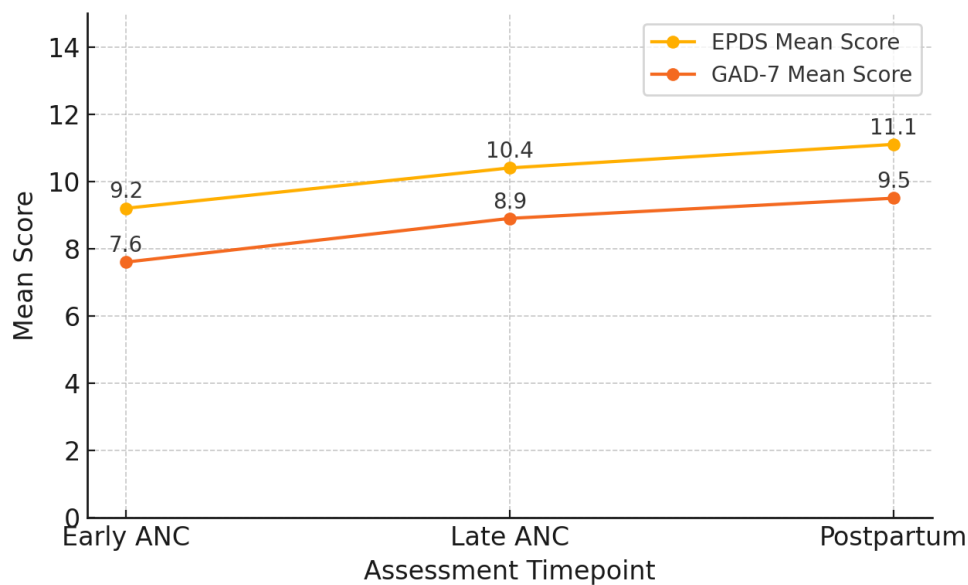


Figure 6: Trend of mean EPDS and GAD-7 scores across assessment timepoints

Discussion

The current study explored the psychosocial and obstetric risk factors associated with perinatal depression and anxiety among pregnant women, using validated screening tools and multivariate analysis. Our findings align with existing evidence that perinatal mental health disorders are highly prevalent and multifactorial in origin.

Several Indian and international studies

have documented the wide range of antenatal depression prevalence, from 9.18% to 65.0%, reflecting variations in methodology and sociodemographic settings [10]. Arora and Aeri (2018) highlighted that Indian women face a disproportionately high burden due to low screening rates and sociocultural barriers [10]. Comparable prevalence rates have been reported in Ethiopia, Ghana, and China, emphasizing a global burden [11–13].

Our study reaffirmed the association of poor marital support, domestic violence, financial strain, and pregnancy complications with antenatal depression. Sheeba et al. (2018) reported similar associations in a Bangalore-based cohort, where domestic violence and catastrophic events were key predictors [14]. Tiwari et al. (2024) and Bedaso et al. (2021) also emphasized that lower social support and adverse socioeconomic factors significantly contribute to mental health burden in pregnancy [15,16].

The screening tools employed—EPDS and GAD-7—demonstrated good diagnostic accuracy in our ROC analysis, consistent with findings by Park and Kim (2023), who validated the EPDS as a reliable screening tool with AUC values exceeding 0.80 [17]. Similarly, Levis et al. (2020) reported EPDS sensitivity and specificity >0.80 in diverse perinatal populations [18].

Logistic regression analysis in our cohort highlighted that poor marital support (AOR ~2.5), financial stress (~2.1), and exposure to domestic violence (~1.9) significantly increased odds of depressive symptoms. This aligns with results from Khan et al. (2021), who identified social support and psychosocial stressors as critical predictors of prenatal depression in a rural Pakistani population [19].

Furthermore, Austin et al. (2008) advocate antenatal psychosocial risk assessments as part of routine obstetric care to proactively manage perinatal depression [20]. Given the layered vulnerabilities in low-resource settings, integrating such tools into ANC visits can improve outcomes.

Taken together, the present findings reinforce the importance of multifactorial risk assessment, early screening using standardized tools, and multidisciplinary management for improving perinatal mental health outcomes.

Limitations

This study was conducted at a single tertiary care centre, which may limit the generalizability of the findings. The self-reported nature of the screening tools could introduce response bias. Additionally, certain potential confounders such as genetic predisposition, partner mental health status, and pre-existing psychiatric history were not assessed.

Conclusion

This study highlights the substantial burden of perinatal depression and anxiety and underscores the utility of EPDS and GAD-7 as effective screening tools in antenatal settings.

Psychosocial factors such as poor marital support, domestic violence, and financial stress emerged as significant predictors. Integrating routine mental health screening and targeted interventions during antenatal care can potentially improve maternal and neonatal outcomes.

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