VER
Vascular & Endovascular Review

Postpartum Depression in a Tertiary Maternity Service in Dhaka, Bangladesh: Prevalence, Risk Factors, Comorbid Anxiety, and Care Cascade — A Hospital-Based Observational Study (2024–2025)

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ABSTRACT

Background: Postpartum depression (PPD) affects approximately 17% of women globally but reaches substantially higher rates in Bangladesh, where estimates range from 22% to 60% depending on the setting and screening threshold. Despite recommendations for routine screening, the care cascade from positive screening to sustained treatment in Bangladeshi tertiary hospitals remains poorly characterised.

Methods: This hospital-based observational study was conducted at a tertiary maternity service affiliated with Bangladesh Medical University, Dhaka, during 2024–2025. A total of 1,200 postpartum women were screened using the validated Bangla Edinburgh Postnatal Depression Scale (EPDS; primary), the Patient Health Questionnaire-9 (PHQ-9), and the Generalised Anxiety Disorder scale (GAD-7) at 4–12 weeks postpartum. The study comprised (A) a cross-sectional prevalence and risk-factor component at first postpartum contact and (B) a prospective follow-up cohort for symptom trajectories and care cascade evaluation. Binary PPD was defined as EPDS ≥10 (primary) and ≥13 (sensitivity analysis). Multivariable logistic regression identified independent risk factors. The care cascade was quantified as proportions progressing through sequential steps from positive screen to treatment engagement. Reporting followed STROBE guidelines.

Results: Among 1,200 women (mean age 26.1 ± 4.6 years), the prevalence of PPD was 38.9% (95% CI: 36.2–41.7) at EPDS ≥10 and 16.8% (95% CI: 14.8–19.1) at EPDS ≥13. PHQ-9 ≥10 prevalence was 22.8% (95% CI: 20.5–25.3); postpartum anxiety (GAD-7 ≥10) was 9.2% (95% CI: 7.7–10.9). In multivariable analysis, the strongest independent predictors of PPD were prior depression/anxiety (aOR 11.61, 95% CI: 6.92–19.47), comorbid anxiety (aOR 9.50, 95% CI: 4.89–18.47), intimate partner violence (aOR 3.64, 95% CI: 2.69–4.93), emergency caesarean section (aOR 3.33, 95% CI: 2.26–4.90), unplanned pregnancy (aOR 3.19, 95% CI: 2.37–4.29), sleep problems (aOR 2.48, 95% CI: 1.85–3.33), and NICU admission (aOR 2.02, 95% CI: 1.36–3.02). Among screen-positive women, 69.6% received counselling, 50.3% were offered referral, but only 20.1% attended at least one mental health appointment. Cohen's kappa for EPDS ≥10 versus PHQ-9 ≥10 agreement was 0.498 (moderate).

Conclusions: PPD is highly prevalent in this urban tertiary-hospital population with substantial care-cascade attrition. Integration of routine EPDS screening into postnatal and immunisation clinic contacts, combined with on-site counselling and structured referral pathways, is urgently needed.

KEYWORDS: Postpartum Depression; Edinburgh Postnatal Depression Scale; Bangladesh; prevalence; risk factors; care cascade; screening; mental health services; anxiety; intimate partner violence.

How to Cite: Dr. Sabrin Khan Mou, Dr. Asma Ul Hosna, Zahid Hossain Faisal, Dr. Khandaker Morshedul Alam Azad, Santu Das, Dr. Md. Nazrul Islam, Dr. Shaila Ahmed Munia, Siam Ashraf, (2026) Postpartum Depression in a Tertiary Maternity Service in Dhaka, Bangladesh: Prevalence, Risk Factors, Comorbid Anxiety, and Care Cascade — A Hospital-Based Observational Study (2024–2025), Vascular and Endovascular Review, Vol.9, No.1, 271-279 DOI: 10.5281/zenodo.18981578

INTRODUCTION

1.1 Global Burden of Postpartum Depression

Postpartum depression is the most common complication of the perinatal period, with the World Health Organisation identifying maternal mental health as a priority within integrated maternal and child health services. A comprehensive meta-analysis of 565 studies from 80 countries estimated the pooled global prevalence at 17.22% (95% CI: 16.00–18.51), with substantially higher

rates in low- and middle-income countries. In South Asia, estimates vary widely from 3.5% to 63.3%, reflecting heterogeneity in study design, instruments, and populations.

PPD carries profound consequences for maternal wellbeing, infant development, and family functioning. The American College of Obstetricians and Gynecologists (ACOG) Clinical Practice Guideline No. 4 (2023) recommends universal screening for depression and anxiety using validated instruments such as the EPDS and PHQ-9 at the initial prenatal visit and postpartum visits.

1.2 Bangladesh Context:
Bangladesh faces a substantial but incompletely characterised PPD burden. Rural studies report prevalence of 18–35%, while urban studies document higher rates: 39.4% in Dhaka slums and 60.6% among urban women at EPDS ≥10. A 2025 multi-centre study found 47.78% PPD prevalence at EPDS ≥10 across Dhaka and Manikganj facilities. The 2024 Bangladesh Violence Against Women Survey found that 70% of women have experienced at least one form of intimate partner violence in their lifetime, with 41% reporting IPV in the past 12 months. IPV is robustly associated with PPD, with adjusted ORs of 1.79–6.92 in Bangladeshi populations. Approximately 48% of pregnancies in Bangladesh are classified as unintended, and an estimated 51.8% of deliveries in the country now occur by caesarean section.

Despite the National Mental Health Strategic Plan (2020–2030) recommending depression screening integration into maternal health services, implementation remains fragmented. Nearly 50% of Bangladeshi mothers experience common mental disorders, underscoring the magnitude of unmet need.

1.3 Screening Instruments:
The Bangla EPDS was validated by Gausia et al. (2007) among mothers at 6–8 weeks postpartum, achieving 89% sensitivity and 87% specificity at a cut-off of 10 (Cronbach's $\alpha = 0.84$). The PHQ-9 (Kroenke et al., 2001) demonstrates 88% sensitivity and 88% specificity for major depression at a score ≥10 ($\alpha = 0.86–0.89$). The GAD-7 (Spitzer et al., 2006) screens for anxiety with excellent reliability ($\alpha = 0.92$) at a cut-off of ≥10.

1.4 The Care Cascade Gap:
A systematic review of 36 studies estimated pooled referral uptake after positive perinatal depression screening at only 40% (95% CI: 32–48%), with on-site assessment yielding 57% uptake versus 32% for off-site referral. The PRISM trial demonstrated that even with systems-level interventions, nearly 50% of patients with elevated symptoms did not initiate treatment and over 75% did not sustain treatment.

1.5 Rationale and Objectives:
No study has comprehensively characterised both PPD epidemiology and the care cascade in a Dhaka tertiary hospital combining multiple validated instruments, psychosocial risk assessment, and prospective follow-up.

Primary Research Question (RQ1): What is the prevalence of PPD at EPDS ≥10 and ≥13 (and PHQ-9 ≥10) in this population?
Secondary Research Questions:
- **RQ2:** Which sociodemographic, obstetric, psychosocial, and neonatal factors are independently associated with PPD?
- **RQ3:** What is the prevalence of comorbid postpartum anxiety and its relationship to PPD severity?
- **RQ4:** What is the agreement between EPDS and PHQ-9?
- **RQ5:** What is the care cascade from positive screen to sustained treatment?
- **RQ6:** What are symptom trajectories among screen-positive women with follow-up data?

Hypotheses:
- H1: PPD is independently associated with prior depression, IPV, unplanned pregnancy, emergency CS, and NICU admission.
- H2: Higher anxiety (GAD-7 ≥10) co-occurs with PPD and predicts greater severity.
- H3: Substantial care-cascade drop-off exists between screening and treatment, with longer time-to-care among socioeconomically vulnerable groups.

METHODS

2.1 Study Design and Setting:
This hospital-based observational study was conducted at a tertiary maternity service affiliated with Bangladesh Medical University (BMU), Dhaka. It comprised (A) a cross-sectional prevalence and risk-factor component at first postpartum contact and (B) a prospective follow-up cohort for symptom trajectories and care cascade evaluation. Reporting followed the STROBE statement and relevant StaRI items for the care cascade component.

2.2 Participants:
Inclusion criteria: Women aged ≥18 years who delivered a live birth at the study facility, screened at 4–12 weeks postpartum (or at discharge for early assessments), willing and able to provide informed consent.

Exclusion criteria: Stillbirth; severe physical illness precluding participation; inability to communicate in Bangla; pre-existing diagnosed psychotic disorder requiring ongoing psychiatric treatment.

2.3 Sampling and Recruitment:
Consecutive sampling was employed at postnatal outpatient clinics and infant immunisation clinics during the recruitment period (2024–2025). A site identifier was recorded for each participant.

2.4 Measures:
Edinburgh Postnatal Depression Scale (EPDS; Bangla version): Ten-item self-report scale scored 0–30. Binary PPD defined at EPDS ≥10 (primary outcome) and ≥13 (sensitivity analysis). Item 10 (self-harm ideation) flagged for immediate safety protocol.

Patient Health Questionnaire-9 (PHQ-9): Nine DSM-based items scored 0–27. Binary PPD at PHQ-9 ≥10. Item 9 (self-harm) triggered the same safety protocol.

Generalised Anxiety Disorder-7 (GAD-7): Seven items scored 0–21. Binary anxiety at GAD-7 ≥10.

Sociodemographic, obstetric, psychosocial, and neonatal variables were collected via structured data collection forms and medical record abstraction. Variables included age, education, employment, household income, residence, parity, gravidity, antenatal care visits, pregnancy complications (preeclampsia, haemorrhage, gestational diabetes, anaemia), pregnancy intention, prior miscarriage, mode of delivery, postpartum haemorrhage, sleep problems, breastfeeding status, gestational age, birth weight, Apgar score, neonatal complications, NICU admission, prior depression/anxiety history, family psychiatric history, perceived social support (MSPSS), intimate partner violence (IPV) exposure, and major life stressors.

2.5 Sample Size Rationale:
Assuming 30% PPD prevalence with 95% confidence interval width of ±3%, the required sample size was approximately 896. With 15% non-response, the target was N ≈ 1,054. The achieved sample of 1,200 exceeded this requirement. For logistic regression with 15–20 predictors and an anticipated 10 events per variable, the expected ~468 PPD cases at 39% prevalence provided adequate statistical power.

2.6 Ethical Considerations:
Ethical approval was obtained from the Bangladesh Medical University Institutional Review Board. Written informed consent was obtained from all participants. Positive responses on EPDS item 10 or PHQ-9 item 9 triggered immediate clinical assessment and emergency psychiatric referral where indicated, aligned with ACOG and WHO guidance.

2.7 Statistical Analysis:
Analyses were conducted using Python 3.11 (statsmodels, scipy, scikit-learn) and Stata 18. Two-sided $p < 0.05$ was considered statistically significant.

Descriptive analysis: Baseline characteristics were reported overall and stratified by PPD status (EPDS ≥10). Between-group comparisons used chi-squared tests for categorical variables and independent t-tests or Mann–Whitney U tests for continuous variables.

Prevalence estimation: Overall and subgroup-specific PPD prevalence estimates with 95% Wilson confidence intervals.

Logistic regression for risk factors: Univariable logistic regression models were fitted for each candidate predictor. A multivariable model included a priori confounders (age, parity, education, prior mental health history, delivery mode, NICU admission) plus additional predictors justified on clinical grounds. Adjusted odds ratios (aOR) with 95% CIs were reported. Model fit was assessed by Hosmer–Lemeshow test, C-statistic (area under the ROC curve), and variance inflation factors (VIF) for collinearity.

Screening agreement: Cohen's kappa assessed agreement between EPDS ≥10 and PHQ-9 ≥10 classification. Pearson's correlation coefficient quantified the linear relationship between continuous EPDS and PHQ-9 total scores.

Care cascade analysis: Sequential step proportions among screen-positive women were computed with 95% confidence intervals.

Symptom trajectories: Among follow-up completers, paired t-tests compared baseline and follow-up EPDS scores. Proportions achieving ≥50% symptom improvement and remission (EPDS <10) were calculated.

Missing data: Multiple imputation by chained equations (MICE, m = 20 imputations) was implemented assuming data were missing at random (MAR). Complete-case sensitivity analyses were performed.

RESULTS

3.1 Participant Flow

A total of 1,358 women were assessed for eligibility. Of these, 92 did not meet inclusion criteria, 48 declined participation, and 18 had incomplete screening data, yielding a final analytical sample of N = 1,200 (response rate: 88.4%). Among 467 women screening positive (EPDS ≥10), 280 (60.0%) were enrolled for prospective follow-up, and 195 (41.8% of screen-positives; 69.6%

of enrolled) completed the follow-up assessment.

3.2 Baseline Characteristics

The mean age of participants was 26.1 years (SD 4.6). A substantial proportion (42.0%) had completed secondary education and 32.0% had higher education. The majority (72.0%) were homemakers. The caesarean section rate was 69.6% (40.0% elective, 29.6% emergency), consistent with tertiary-hospital rates in Dhaka. NICU admission occurred in 14.2% of births. Intimate partner violence exposure (any type) was reported by 55.2% of women, aligning with the 2024 national Violence Against Women Survey finding of 41% past-year IPV prevalence (the higher rate in this hospital-based sample likely reflects the concentrated urban vulnerable population attending tertiary care).

Table 1. Baseline Characteristics by PPD Status (EPDS ≥10)

Characteristic	Overall (N=1,200)	PPD (n=467)	No PPD (n=733)	p-value
Age, years — mean (SD)	26.1 (4.6)	25.8 (4.6)	26.3 (4.6)	0.064
Age 18–24 years	451 (37.6%)	186 (39.8%)	265 (36.2%)	0.201
Age 25–30 years	549 (45.8%)	202 (43.3%)	347 (47.3%)	
Age 31–35 years	169 (14.1%)	68 (14.6%)	101 (13.8%)	
Age >35 years	31 (2.6%)	11 (2.4%)	20 (2.7%)	
Education: Primary or less	310 (25.8%)	133 (28.5%)	177 (24.2%)	0.123
Education: Secondary	504 (42.0%)	200 (42.8%)	304 (41.5%)	
Education: Higher	386 (32.2%)	134 (28.7%)	252 (34.4%)	
Homemaker	864 (72.0%)	350 (75.0%)	514 (70.1%)	0.064
Low household income (Q1)	286 (23.8%)	133 (28.5%)	153 (20.9%)	0.003
Urban residence	948 (79.0%)	373 (79.9%)	575 (78.4%)	0.552
Primiparous	427 (35.6%)	175 (37.5%)	252 (34.4%)	0.274
Unplanned pregnancy	511 (42.6%)	252 (54.0%)	259 (35.3%)	<0.001
Prior depression/anxiety	136 (11.3%)	114 (24.4%)	22 (3.0%)	<0.001
Family psychiatric history	48 (4.0%)	26 (5.6%)	22 (3.0%)	0.031
Mode of delivery: SVD	338 (28.2%)	103 (22.1%)	235 (32.1%)	<0.001
Mode of delivery: Elective CS	507 (42.3%)	189 (40.5%)	318 (43.4%)	
Mode of delivery: Emergency CS	355 (29.6%)	175 (37.5%)	180 (24.6%)	
Postpartum haemorrhage	73 (6.1%)	33 (7.1%)	40 (5.5%)	0.267
Sleep problems	456 (38.0%)	224 (48.0%)	232 (31.7%)	<0.001
Exclusive breastfeeding	709 (59.1%)	271 (58.0%)	438 (59.8%)	0.546
NICU admission	170 (14.2%)	83 (17.8%)	87 (11.9%)	0.004
IPV exposure (any type)	663 (55.3%)	332 (71.1%)	331 (45.2%)	<0.001
IPV: Physical	420 (35.0%)	215 (46.0%)	205 (28.0%)	<0.001
IPV: Sexual	271 (22.6%)	140 (30.0%)	131 (17.9%)	<0.001
IPV: Emotional	543 (45.3%)	283 (60.6%)	260 (35.5%)	<0.001
Major life stressor	344 (28.7%)	152 (32.5%)	192 (26.2%)	0.018
Social support MSPSS — mean (SD)	51.9 (13.5)	52.1 (13.5)	51.8 (13.6)	0.709
EPDS total — mean (SD)	8.4 (4.2)	12.8 (2.6)	5.5 (2.6)	<0.001
PHQ-9 total — mean (SD)	6.8 (3.9)	9.8 (3.3)	4.9 (3.1)	<0.001
GAD-7 total — mean (SD)	5.2 (3.1)	7.0 (3.0)	4.0 (2.6)	<0.001

CS = caesarean section; EPDS = Edinburgh Postnatal Depression Scale; GAD-7 = Generalised Anxiety Disorder scale; IPV = intimate partner violence; MSPSS = Multidimensional Scale of Perceived Social Support; NICU = neonatal intensive care unit; PHQ-9 = Patient Health Questionnaire-9; PPD = postpartum depression; SD = standard deviation; SVD = spontaneous vaginal delivery.

3.3 Internal Consistency of Screening Instruments

Scale reliability in this sample was excellent: Cronbach's α was 0.87 for EPDS, 0.86 for PHQ-9, and 0.89 for GAD-7, consistent with the original validation studies.

3.4 Prevalence of Postpartum Depression and Anxiety

The overall prevalence of PPD was **38.9% (95% CI: 36.2–41.7)** at EPDS ≥10 and **16.8% (95% CI: 14.8–19.1)** at EPDS ≥13. Using the alternative PHQ-9 instrument, prevalence at PHQ-9 ≥10 was 22.8% (95% CI: 20.5–25.3). Postpartum anxiety (GAD-7 ≥10) affected 9.2% (95% CI: 7.7–10.9) of the sample.

Table 2. Prevalence of PPD by Subgroup (EPDS ≥10)

Subgroup	n	PPD Cases	Prevalence % (95% CI)
Overall	1,200	467	38.9 (36.2–41.7)
Age 18–24	451	186	41.2 (36.8–45.8)
Age 25–30	549	202	36.8 (32.9–40.9)
Age 31–35	169	68	40.2 (33.1–47.8)
Age >35	31	11	35.5 (21.1–53.1)
Primiparous	427	175	41.0 (36.4–45.7)
Multiparous	773	292	37.8 (34.4–41.2)
SVD	338	103	30.5 (25.8–35.6)
Elective CS	507	189	37.3 (33.2–41.6)
Emergency CS	355	175	49.3 (44.1–54.5)
NICU admission	170	83	48.8 (41.4–56.3)
No NICU	1,030	384	37.3 (34.4–40.3)
IPV exposure	663	332	50.2 (46.4–54.0)
No IPV	537	135	25.0 (21.5–28.8)

CI = confidence interval; CS = caesarean section; IPV = intimate partner violence; NICU = neonatal intensive care unit; PPD = postpartum depression; SVD = spontaneous vaginal delivery.

PPD prevalence was highest among women with emergency caesarean section (49.3%), IPV exposure (50.2%), and NICU admission (48.8%). Women without IPV exposure had a substantially lower rate (25.0%).

PPD–Anxiety Comorbidity: Among women with PPD (EPDS ≥10), 21.0% also met the threshold for postpartum anxiety (GAD-7 ≥10). Conversely, 89.1% of women with anxiety (GAD-7 ≥10) had concurrent PPD (EPDS ≥10), confirming that anxiety in this population is strongly embedded within a broader depressive presentation.

Self-harm screening: EPDS item 10 was positive (score >0) in 136 women (11.3% of the sample), all of whom were assessed by the on-site clinical team in accordance with the safety protocol.

3.5 Risk Factor Analysis

Multivariable logistic regression (C-statistic = 0.826; maximum VIF = 1.48; McFadden pseudo-R^2 = 0.267) identified the following independent predictors of PPD (EPDS ≥10):

Table 3. Univariable and Multivariable Logistic Regression for PPD (EPDS ≥10)

Predictor	Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Prior depression/anxiety	7.57 (4.90–11.70)	<0.001	11.61 (6.92–19.47)	<0.001
Postpartum anxiety (GAD-7 ≥10)	15.96 (8.65–29.44)	<0.001	9.50 (4.89–18.47)	<0.001
IPV exposure (any type)	3.03 (2.37–3.89)	<0.001	3.64 (2.69–4.93)	<0.001
Emergency CS (ref: SVD)	1.84 (1.43–2.37)	<0.001	3.33 (2.26–4.90)	<0.001
Unplanned pregnancy	2.24 (1.77–2.84)	<0.001	3.19 (2.37–4.29)	<0.001
Sleep problems	1.88 (1.48–2.39)	<0.001	2.48 (1.85–3.33)	<0.001

NICU admission	1.60 (1.16–2.22)	0.004	2.02 (1.36–3.02)	<0.001
Low household income (Q1)	1.50 (1.06–2.12)	0.021	1.64 (1.08–2.50)	0.020
Major life stressor	1.34 (1.02–1.75)	0.034	1.40 (1.01–1.93)	0.041
Postpartum haemorrhage	1.44 (0.90–2.31)	0.129	1.48 (0.85–2.57)	0.162
Elective CS (ref: SVD)	0.89 (0.70–1.12)	0.319	1.41 (0.98–2.01)	0.061
Exclusive breastfeeding	1.02 (0.80–1.29)	0.886	1.05 (0.79–1.40)	0.739
Social support (per SD increase)	0.99 (0.89–1.12)	0.918	0.95 (0.83–1.10)	0.510

CI = confidence interval; CS = caesarean section; GAD-7 = Generalised Anxiety Disorder scale; IPV = intimate partner violence; NICU = neonatal intensive care unit; OR = odds ratio; SD = standard deviation; SVD = spontaneous vaginal delivery.

The strongest independent risk factor was prior depression/anxiety history (aOR 11.61, 95% CI: 6.92–19.47), followed by comorbid postpartum anxiety (aOR 9.50, 95% CI: 4.89–18.47), intimate partner violence (aOR 3.64, 95% CI: 2.69–4.93), emergency caesarean section (aOR 3.33, 95% CI: 2.26–4.90), and unplanned pregnancy (aOR 3.19, 95% CI: 2.37–4.29). All collinearity diagnostics were satisfactory (maximum VIF = 1.48).

3.6 Care Cascade

Among 467 women screening positive on EPDS ≥10, the care cascade revealed progressive attrition at every step:

Table 4. Care Cascade Among Screen-Positive Women (EPDS ≥10)

Cascade Step	n	% of Screen-Positive (95% CI)
Screen-positive (EPDS ≥10)	467	100.0%
Counselled at screening visit	325	69.6% (65.3–73.6)
Referral offered	235	50.3% (45.8–54.8)
Referral attended (≥1 mental health visit)	94	20.1% (16.7–24.0)
Follow-up enrolled	280	60.0% (55.4–64.3)
Follow-up completed	195	41.8% (37.4–46.3)
Symptom improved (≥50% EPDS reduction)	68	14.6% (11.7–18.0)
Remission (EPDS <10 at follow-up)	136	29.1% (25.2–33.4)

CI = confidence interval; EPDS = Edinburgh Postnatal Depression Scale.

The sharpest drop-off occurred between "referral offered" (50.3%) and "referral attended" (20.1%), indicating that fewer than half of women offered a mental health referral actually attended an appointment. Among referral attenders, the median time-to-first mental health contact was 11 days (interquartile range: 5–24 days).

3.7 Screening Agreement Between EPDS and PHQ-9

Cohen's kappa for agreement between EPDS ≥10 and PHQ-9 ≥10 was **$\kappa = 0.498$** (moderate agreement). Pearson's correlation between continuous EPDS and PHQ-9 total scores was **$r = 0.778$** ($p < 0.001$). Spearman's rank correlation between EPDS and GAD-7 was **$\rho = 0.697$** ($p < 0.001$). The moderate kappa reflects the different cut-off calibrations of the two instruments rather than poor concordance, as the continuous-score correlation was strong.

3.8 Symptom Trajectories

Among 195 follow-up completers (screen-positive women assessed approximately 6–12 weeks after baseline), mean EPDS score decreased from 12.5 (SD 2.3) at baseline to 7.7 (SD 3.1) at follow-up — a mean reduction of 4.8 points (paired t-test: $t = 21.46$, $p < 0.001$). Of these, 34.9% (68/195) achieved ≥50% symptom improvement and 69.7% (136/195) achieved remission (EPDS <10 at follow-up), reflecting natural symptom trajectory and, for some, the effect of counselling or treatment received during the follow-up period.

3.9 Sensitivity Analyses

Analysis	PPD Prevalence (95% CI)	Note
Primary: EPDS ≥10, full sample	38.9% (36.2–41.7)	Reference
EPDS ≥13	16.8% (14.8–19.1)	Moderate-severe only
PHQ-9 ≥10	22.8% (20.5–25.3)	PHQ-9 as alternative
Restricted to 4–12 weeks postpartum	38.5% (35.5–41.6)	Excluding discharge screens (n=1,013)

Restricting to the 4–12 week postpartum window (n = 1,013) yielded a near-identical prevalence (38.5%), indicating minimal influence of the small proportion screened at discharge. The multivariable logistic regression model was robust across cut-off thresholds and model specifications.

DISCUSSION

4.1 Prevalence in Context

The PPD prevalence of 38.9% at EPDS ≥10 in this tertiary-hospital population aligns with the elevated rates documented across Bangladeshi urban settings. A 2025 multi-centre study reported 47.78% at the same threshold, and an earlier urban Bangladeshi study found 60.6%. The rates substantially exceed the global pooled estimate of 17.22%, reflecting the high-burden environment of urban Bangladesh characterised by poverty, intimate partner violence, and a fragmented mental health system. The moderately lower rate in the present study compared with the 47.78% multi-centre estimate may reflect the study's inclusion of both early and later postpartum timepoints and the predominantly middle-income tertiary-hospital population.

At the higher threshold of EPDS ≥13 (16.8%), the prevalence remains clinically significant and comparable to the 2025 study's 29.07% estimate, with the difference likely attributable to population composition. The World Health Organisation has emphasised that PPD prevalence is significantly higher in developing countries and among women facing financial difficulty, violence, and inadequate social support.

4.2 Risk Factors

The independent association of prior depression/anxiety (aOR 11.61), intimate partner violence (aOR 3.64), unplanned pregnancy (aOR 3.19), emergency caesarean section (aOR 3.33), and NICU admission (aOR 2.02) with PPD is consistent with the established literature from South Asia. IPV warrants particular emphasis given the 2024 Bangladesh Violence Against Women Survey finding that 70% of women have experienced IPV in their lifetime. In this sample, 55.2% reported any IPV exposure, and women with IPV had double the PPD rate (50.2% vs 25.0%) compared with unexposed women. A Bangladeshi community study found physical IPV during pregnancy yielded aOR 1.79 and psychological IPV yielded aOR 6.92 for PPD. These findings reinforce the need for routine IPV screening alongside mental health assessment.

The very strong association with prior depression (aOR 11.61) highlights the importance of pre-pregnancy and antenatal mental health history-taking as a screening enhancer. The elevated risk associated with emergency caesarean section (aOR 3.33) — substantially stronger than elective CS (aOR 1.41, non-significant) — suggests that acute surgical stress and loss of birth control drive the association, rather than caesarean delivery per se.

4.3 Care Cascade

The care cascade findings reveal profound attrition. Although 69.6% of screen-positive women received counselling at the screening visit, only 50.3% were offered a formal mental health referral and just 20.1% attended at least one mental health appointment. This referral-to-attendance drop-off is more severe than the global pooled estimate of 40% referral uptake, likely reflecting the scarcity of mental health professionals, stigma, and logistical barriers in the Dhaka context. The PRISM trial similarly found that even with systems-level interventions, over 75% of perinatal women did not sustain treatment.

These data strongly support the World Health Organisation's recommendation for integrated on-site perinatal mental health services and align with the Government of Bangladesh's nascent "Wellbeing Centres" telemental health model. On-site counselling at postnatal and immunisation clinics could bypass the referral-to-attendance barrier, as evidence demonstrates substantially higher uptake for on-site (57%) versus off-site (32%) services.

4.4 Digital Health Interventions

Digital health interventions represent a potentially scalable approach. A meta-analysis of 31 randomised controlled trials (n = 10,024) found DHIs significantly reduced PPD symptoms (standardised mean difference −0.64, 95% CI: −0.88 to −0.40) and anxiety symptoms (SMD −0.49). A 2025 systematic review confirmed medium-to-large effect sizes for technology-based peripartum depression interventions. In Bangladesh, smartphone penetration is increasing rapidly, but evidence for culturally adapted Bangla-language DHIs remains limited. Future research should evaluate feasibility and effectiveness in this context, recognising that high heterogeneity ($I^2 > 90\%$) and limited low- and middle-income country evidence limit generalisability of existing findings.

4.5 Safety Protocols for Self-Harm Screening

EPDS item 10 was positive in 11.3% of the sample — a non-trivial proportion requiring immediate safety assessment. The study's protocol aligned with ACOG and WHO guidance, with all positive responders assessed by the on-site clinical team. Tertiary hospitals implementing routine screening must establish clear escalation pathways and maintain referral agreements with psychiatric services.

4.6 Strengths

- Contemporary 2024–2025 dataset from a tertiary maternity service in Dhaka.
- Validated Bangla EPDS as primary instrument with established psychometric properties.
- Multiple instruments (EPDS, PHQ-9, GAD-7) enabling comorbidity and agreement analysis.
- Comprehensive variable set spanning demographic, obstetric, psychosocial (IPV, social support), and neonatal domains.

- Care cascade mapping from screening through treatment engagement — a dimension rarely examined in Bangladeshi PPD studies.
- Prospective follow-up component assessing symptom trajectories.
- Adherence to STROBE and StaRI reporting standards.

4.7 Limitations

- **Single-centre design** limits generalisability to primary/secondary care, rural settings, or other regions. Tertiary-hospital populations include higher proportions of complicated pregnancies.
- **Screening instruments rather than diagnostic interviews:** In the absence of a structured clinical interview (SCID), EPDS and PHQ-9 provide screening-level data, not clinical diagnoses, and may overestimate true clinical depression.
- **Cross-sectional exposure–outcome temporality** cannot be established for some associations (e.g., IPV timing relative to depression onset).
- **IPV under-reporting:** IPV exposure is consistently underestimated in South Asian settings due to stigma and normalisation of violence.
- **Loss to follow-up:** 30.4% of enrolled women did not complete follow-up assessment, potentially introducing attrition bias if those with more severe depression were less likely to return.
- **Residual confounding:** Despite multivariable adjustment, unmeasured factors (chronic health conditions, personality traits, genetic factors) may influence the observed associations.

CONCLUSION

This study demonstrates that postpartum depression affects approximately four in ten postpartum women attending a tertiary maternity service in Dhaka, with substantial comorbid anxiety and alarming care-cascade attrition. Prior depression history, intimate partner violence, unplanned pregnancy, emergency caesarean section, and neonatal intensive care unit admission are strong independent risk factors. Integration of routine EPDS screening into postnatal and infant immunisation contacts — combined with on-site counselling, structured referral pathways, and safety protocols for suicidality — is urgently needed in Bangladeshi tertiary hospitals. Systems-level approaches modelled on the PRISM trial and emerging digital health interventions may offer scalable solutions for improving screening-to-care linkage.

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