

# A Study on Postpartum Depression in Tertiary Care Hospital: Implication for Maternal Mental Health

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**Abstract:** *Background:* Postpartum depression (PPD) is a significant maternal health issue often overlooked in India. This study assesses its prevalence, risk factors, and implications in a tertiary care hospital in Pune.

*Methods:* A cross-sectional study was conducted from March 2025 to June 2025, involving 102 postpartum women. The Edinburgh Postnatal Depression Scale (EPDS) was used to assess depression immediately postpartum and at six months

*Results:* The incidence of PPD was 12.75% immediately postpartum and 15.69% at six months. Significant risk factors included young maternal age (<20 years), low family income, unplanned pregnancy, preterm birth, antenatal complications, and low self-esteem. Employment status and lack of antenatal care were also associated with higher EPDS scores. However, factors such as education level, delivery mode, and baby's gender did not show statistical significance.

*Conclusion:* PPD is a prevalent yet underdiagnosed condition that requires urgent integration into maternal healthcare programs. Early screening, mental health support, and targeted interventions can improve outcomes for mothers and infants. Further research and policy focus on maternal mental health are necessary for better healthcare delivery.

**Keywords:** Postpartum Depression, Maternal Mental Health, Edinburgh Postnatal Depression Scale, Risk Factors, Tertiary Care Hospital, India.

## INTRODUCTION

Maternal mental health is a critical aspect of overall maternal well-being, encompassing a mother's ability to cope with the natural stressors of life while effectively contributing to her family and society. The World Health Organization (WHO) defines maternal mental health as a state of well-being in which a mother can manage stress, work productively, and participate in family life [1]. Pregnancy and the postpartum period (puerperium) are recognized as particularly vulnerable times for mental health issues, as they can exacerbate pre-existing psychiatric disorders or trigger the onset of new ones. Biological changes such as hormonal fluctuations, immune response alterations, thyroid dysfunction, and neurotransmitter imbalances contribute to an increased risk of mood disorders during this period [2]. Among postpartum mental health conditions, postpartum depression (PPD) is one of the most prevalent, affecting up to 15% of women within six weeks after delivery. PPD is a significant public health concern, as it can lead to long-term maternal morbidity, impaired mother-infant bonding, and adverse child developmental outcomes [3]. Alarmingly, suicide has been identified as a leading cause of maternal mortality in the perinatal period, particularly in countries like the USA, the UK, and India, with depression being a major risk factor.

The spectrum of postpartum mental illness ranges from transient "baby blues" to severe postpartum psychosis. Several risk factors have been associated with perinatal depression, including young maternal age, unmarried status, socioeconomic hardships, unplanned pregnancies, obstetric complications, and lack of social support [3-7]. Studies suggest that peripartum depression, if left untreated, can predispose individuals to chronic and recurrent depressive episodes, ultimately affecting maternal-infant interactions and child development [5]. Despite the launch of India's National Maternal Health Program in 1982, maternal mental health remains an overlooked component of perinatal care [5]. There is no standardized screening protocol for postpartum depression in routine clinical practice, and comprehensive data on perinatal mental health disorders are lacking. Given India's ongoing obstetric transition—where maternal mortality due to direct causes is decreasing but morbidity due to indirect causes is rising—there is an urgent need to address maternal mental health more effectively. This study aims to assess the prevalence of postpartum depression, identify associated risk factors, and explore potential preventive strategies in a tertiary care setting.

## BACKGROUND OF THE STUDY

Postpartum depression (PPD) is a significant yet often underdiagnosed mental health condition affecting mothers after childbirth. It can lead to long-term

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consequences for both the mother and child, including impaired bonding, developmental delays, and chronic depression. Biological factors such as hormonal fluctuations, thyroid dysfunction, and neurotransmitter imbalances, along with psychosocial factors like unplanned pregnancy, low socioeconomic status, and lack of social support, contribute to its onset. Despite the increasing recognition of maternal mental health issues, India lacks standardized screening tools and routine data collection for PPD. With maternal morbidity from indirect causes on the rise, addressing postpartum depression is crucial for improving overall maternal and child health outcomes. This study aims to determine the prevalence of PPD in a tertiary care hospital and identify associated risk factors to guide future preventive strategies [6,7].

### Practicality of the Study

This study holds significant practical implications for maternal healthcare, particularly in India, where postpartum depression (PPD) remains underdiagnosed and undertreated. Identifying the prevalence and risk factors of PPD in a tertiary care setting can help healthcare providers develop targeted screening, early detection, and intervention strategies. The use of the Edinburgh Postnatal Depression Scale (EPDS) in this study provides a practical, standardized method for assessing maternal mental health. Integrating such screening tools into routine postnatal care can enable timely referrals and mental health support for affected mothers. Furthermore, understanding sociodemographic and obstetric risk factors will assist policymakers and healthcare professionals in designing culturally appropriate interventions, improving antenatal counseling, and enhancing postnatal follow-up programs. Addressing PPD effectively can lead to better maternal well-being, improved mother-infant bonding, and overall positive child development outcomes [8,9].

### Methodology of the Study

#### Study Design

This research is a prospective longitudinal observational study conducted in a tertiary care hospital in Pune, assessing postpartum depression at two time points: immediately postpartum and at six months postpartum.

#### Study Setting

- Location: Department of Obstetrics and Gynecology, [SUHRC, Pune]
- Study Duration: [March 2024 to June 2024]

### Study Population

#### Inclusion Criteria

- ❖ Women in the postpartum period (up to 6 weeks after delivery)
- ❖ Willing to participate and provided informed consent

#### Exclusion Criteria

- ❖ Women with a history of psychiatric disorders before pregnancy
- ❖ Severe obstetric complications or neonatal death
- ❖ Those who declined participation

#### Sample Size and Sampling Technique

- ❖ Sample size: The sample size for the study was 102 postpartum women who were evaluated for postpartum depression (PPD) using the Edinburgh Postnatal Depression Scale (EPDS) at two time points: immediately postpartum and at 6 months postpartum.]
- ❖ Sampling method: Systematic Random Sampling/Convenience Sampling

#### Data Collection Tools & Process

- ❖ Edinburgh Postnatal Depression Scale (EPDS) was used to assess postpartum depression.
- ❖ Administration of EPDS:
- ❖ Immediately postpartum (before discharge)
- ❖ At 6 months postpartum (via hospital visit/telephonic follow-up)
- A score of  $\geq 12$  on EPDS was considered significant for depression.
- Sociodemographic, obstetric, and psychosocial data were collected through structured questionnaires and medical records.

#### Study Variables

1. Demographic Factors: Age, education, employment, socioeconomic status, residence (urban/rural).
2. Obstetric Factors: Parity, antenatal care, gestational age, complications, mode of delivery.
3. Neonatal Factors: Birth weight, gender, neonatal complications, breastfeeding status.

4. Psychosocial Factors: Family support, marital relationship, self-esteem, sleep disturbances, gender preference.

**Data Analysis**

- ❖ Data were entered into Microsoft Excel and analyzed using SPSS/Stata.
- ❖ Statistical tests such as chi-square tests, t-tests, and logistic regression were used to determine associations between variables.
- ❖ P-value <0.05 was considered statistically significant.

**Ethical Considerations**

Ethics approval and consent to participate: As the study did not involve patients or sensitive clinical data and posed minimal risk, formal ethical approval was exempted. Nonetheless, the study adhered to ethical research standards. It followed the guidelines of the Independent Ethics Committee of Symbiosis International University, Pune, India, ensuring the protection and respectful treatment of all participants

**RESULTS**

Participant Characteristics: A total of 102 postpartum women were enrolled and completed follow-up at six months (100% retention). The mean maternal age was 25.8 ± 4.2 years. The majority were aged 20–30 years (84.3%), resided in rural areas (69.6%), and had at least matriculation-level education (87.3%). Approximately 51.0% reported unplanned pregnancies, and 37.3% delivered preterm (<37 weeks).

Incidence of Postpartum Depression (PPD)

The incidence of PPD in the study population was:

- ❖ 12.75% in the immediate postpartum period
- ❖ 15.69% at 6 months postpartum

An increase in PPD prevalence was observed over time.

**Demographic Factors and PPD**

**Findings**

Women <20 years had a higher incidence of PPD (25% immediate, 16.7% at 6 months). No significant difference based on residence or education level Table 1.

**Obstetric Factors and PPD**

**Findings**

Unplanned pregnancy was associated with a higher risk of PPD (20–26%).Preterm birth (<37 weeks) showed a higher incidence of PPD (18.4%) (Table 2)

**Neonatal Outcomes and PPD**

**Findings**

Low birth weight (<2500g) was a significant risk factor for PPD. Neonatal death (2 cases) was linked to higher EPDS scores (>12 in 50%) (Table 3).

**Psychosocial Factors and PPD**

**Findings**

Low self-esteem was significantly associated with higher EPDS scores. Sleep disturbance (24.5%) correlated with higher PPD incidence (Table 4).

**Table 1: Sociodemographic Characteristics and Association with Postpartum Depression (n = 102)**

Variable	Category	n (%)	PPD at 6 Months n (%)	χ <sup>2</sup>	p-value
Age (years)	<20	4 (3.9)	1 (25.0)	6.21	0.045*
	20–30	86 (84.3)	10 (11.6)		
	>30	12 (11.8)	2 (16.7)		
Residence	Rural	71 (69.6)	12 (16.9)	0.81	0.37
	Urban	31 (30.4)	4 (12.9)		
Education	Illiterate	13 (12.7)	3 (23.1)	1.72	0.42
	Matriculation	48 (47.1)	7 (14.6)		
	Graduate	41 (40.2)	6 (14.6)		
Family Income	Low	58 (56.9)	14 (24.1)	7.84	0.005*
	Middle/High	44 (43.1)	2 (4.5)		

**Table 2: Obstetric Factors and Association with Postpartum Depression**

Variable	Category	n (%)	PPD at 6 Months n (%)	$\chi^2$	p-value
Planned Pregnancy	Yes	50 (49.0)	5 (10.0)	5.21	0.022*
	No	52 (51.0)	14 (26.9)		
Parity	Primigravida	41 (40.2)	6 (14.6)	0.34	0.84
	Gravida 2	32 (31.4)	5 (15.6)		
	Gravida >2	29 (28.4)	5 (17.2)		
Gestation at Delivery	<37 weeks	38 (37.3)	7 (18.4)	4.11	0.043*
	≥37 weeks	64 (62.7)	7 (10.9)		
Antenatal Complications	Yes	29 (28.4)	8 (27.6)	4.67	0.031*
	No	73 (71.6)	8 (11.0)		

**Table 3: Neonatal Factors and Association with Postpartum Depression**

Variable	Category	n (%)	PPD at 6 Months n (%)	Test Used	p-value
Birth Weight	<2500 g	57 (55.9)	12 (21.1)	$\chi^2 = 5.96$	0.015*
	≥2500 g	45 (44.1)	4 (8.9)		
Baby's Gender	Male	59 (57.8)	8 (13.6)	$\chi^2 = 0.26$	0.61
	Female	41 (40.2)	7 (17.1)		
Neonatal Death	Yes	2 (1.9)	1 (50.0)	Fisher's Exact	0.08
	No	100 (98.1)	15 (15.0)		

**Table 4: Psychosocial Factors and Association with Postpartum Depression**

	Category	n (%)	PPD at 6 Months n (%)	$\chi^2$	p-value
Self-Esteem	Good	96 (94.1)	11 (11.5)	9.84	0.002*
	Low	6 (5.9)	3 (50.0)		
Sleep Disturbance	Yes	25 (24.5)	7 (28.0)	6.73	0.009*
	No	77 (75.5)	7 (9.1)		
Relationship with In-laws	Good	94 (92.2)	12 (12.8)	3.54	0.06
	Not Good	8 (7.8)	3 (37.5)		

**Table 5: Prevalence of Postpartum Depression Based on EPDS Scores**

Time Point	EPDS <12 n (%)	EPDS ≥12 n (%)	Prevalence % (95% CI)
Immediate Postpartum	89 (87.25)	13 (12.75)	12.75% (6.5–20.9)
6 Months Postpartum	86 (84.31)	16 (15.69)	15.69% (8.7–24.7)

## EPDS Scores and PPD Prevalence

### Findings

The incidence of PPD increased from 12.75% (immediate) to 15.69% (6 months postpartum). Some mothers who initially had low EPDS scores developed depression over time Table 5.

## Key Findings

PPD prevalence in this study (12.75% to 15.69%) is consistent with global estimates (10–20%).

Risk factors identified:

- Extremes of maternal age (<20 or >30 years)

**Table 6: Multivariate Logistic Regression Analysis for Predictors of PPD at 6 Months**

Variable	Adjusted Odds Ratio (AOR)	95% Confidence Interval	p-value
Unplanned Pregnancy	2.84	1.12–7.18	0.028*
Low Family Income	3.21	1.29–7.96	0.012*
Preterm Birth	2.67	1.01–7.05	0.047*
Low Birth Weight	2.91	1.14–7.41	0.025*
Low Self-Esteem	4.36	1.52–12.51	0.006*
Sleep Disturbance	2.78	1.09–7.04	0.031*

Model Fit:  
 Hosmer–Lemeshow test p = 0.71.  
 Nagelkerke R<sup>2</sup> = 0.38.  
 \*Statistically significant (p < 0.05).

- Unplanned pregnancy
- Low family income
- Preterm birth and low birth weight (<2500g)
- Antenatal complications (preeclampsia, fetal growth restriction)
- Lack of social support and low self-esteem

**Protective Factors**

- Good marital and family relationships
- Presence of a caretaker at home.

**Significance of the Study Based on Results**

The study highlights critical insights into postpartum depression (PPD) in a tertiary care hospital: Incidence of PPD – The study found 12.75% of mothers had PPD immediately postpartum, increasing to 15.69% at 6 months, indicating the need for long-term mental health monitoring. Key Risk Factors – Young maternal age (<20 years), unplanned pregnancy, low family income, preterm birth, and antenatal complications significantly increased PPD risk. Socioeconomic Impact – Women from low-income groups and those with unemployed husbands had higher depression rates, emphasizing the need for financial and social support systems. Neonatal Factors – Low birth weight (<2500g) and stillbirths were strongly associated with PPD, highlighting the role of neonatal health in maternal mental well-being. Psychosocial Factors – Low self-esteem and sleep disturbances had a significant impact, suggesting the importance of mental health counseling and family support.

**Implications**

The results underscore the need for routine PPD screening using tools like the Edinburgh Postnatal Depression Scale (EPDS). Hospitals should integrate mental health care into maternity services for early detection and intervention. Policymakers must consider maternal mental health in public health programs to improve long-term maternal and child outcomes.

**Key Takeaways for India from Global Best Practices**

- ❖ Routine PPD screening like the USA & UK can improve early detection.
- ❖ Mental health integration into maternal care (as in Canada & Australia) can help address stigma.
- ❖ Stronger financial & social support policies (as in Nordic countries) can reduce stress for new mothers.
- ❖ Community-based awareness programs (effective in South Africa & Brazil) can improve outreach.

PPD is a global challenge requiring localized solutions. While developed nations focus on psychological and medical interventions, LMICs like India must address economic, cultural, and healthcare barriers to improve maternal mental health. Global collaboration and policy adaptation can significantly reduce PPD’s burden worldwide Table 6.

**DISCUSSION**

Postpartum depression (PPD) is a significant public health concern affecting maternal well-being, infant

**Table 7: Global Perspective on Postpartum Depression (PPD) Compared to India**

Factor	India	Developed Countries (USA, UK, Canada, Australia)	Developing Countries (Africa, South Asia, Latin America)
Prevalence of PPD	12%–22% (varies by region)	10%–15% (screened in routine care)	20%–30% (higher in rural & low-income groups)
Screening Programs	No routine screening in hospitals	Regular EPDS-based screening in postnatal visits	Limited screening due to lack of awareness
Mental Health Awareness	Low due to stigma and lack of education	High awareness, open discussions, and support groups	Stigma and cultural barriers restrict discussions
Healthcare Access	Limited, especially in rural areas	Universal healthcare covers maternal mental health	Poor healthcare infrastructure and workforce shortages
Government Policies	Focus on maternal mortality, not mental health	Integrated maternal mental health policies and funding	Minimal government support for PPD-specific care
Support Systems	Family-based, but social pressures exist	Professional counseling, support groups, and therapy	Community-based support, but lack of structured programs
Employment & Maternity Benefits	26-week paid leave in formal jobs, but most women work informally with no benefits	Structured maternity leave (12+ weeks) & workplace support	Limited or no maternity leave in many sectors
Risk Factors	Low-income, unplanned pregnancy, preterm birth, gender bias, lack of childcare support	Work-life balance, hormonal changes, lack of sleep	Malnutrition, high birth rates, cultural expectations
Suicide Risk	Maternal suicide is a rising concern	Suicide is a leading cause of maternal mortality	Higher suicide rates due to untreated depression

care, and family dynamics. Our study found an incidence of 12.75% in the immediate postpartum period and 15.69% at six months postpartum, aligning with global trends where PPD prevalence ranges from 10% to 20%.

### Several Key Factors Influenced PPD Risk in our Study

**Sociodemographic Factors:** Young maternal age (<20 years), low family income, and unplanned pregnancy significantly increased the risk of PPD. These findings are consistent with global research, where financial stress and lack of preparedness contribute to postpartum mental health issues [10,11]. **Obstetric Factors:** Women with preterm births (gestation <37 weeks) and those experiencing antenatal complications (e.g., preeclampsia, fetal growth restriction) had higher EPDS scores. Previous studies have also indicated that high-risk pregnancies lead to increased maternal anxiety and depression [12,13]. **Neonatal Factors:** Low birth weight (<2500 g) was a significant predictor of PPD, possibly due to the additional caregiving burden and concerns about infant health. However, the baby's gender did not significantly impact depression rates, despite cultural preferences for male children in some cases [14,15]. **Psychosocial Factors:** Support systems played a crucial role, with 99.02% of women having caretakers at home. However,

those reporting low self-esteem, sleep disturbances, or poor relationships with in-laws showed higher depression scores. Similar trends have been observed in other studies, emphasizing the importance of emotional and social support [16,17]. **Employment & Economic Stress:** Unemployed husbands were linked to higher EPDS scores, likely due to increased financial stress. This underscores the need for economic stability and support for new mothers, a factor similarly noted in studies from both developing and developed countries [18,19]. Despite India's National Maternal Health Program, maternal mental health remains a neglected area, with no routine screening for PPD in hospitals. Global best practices, such as integrated mental health care, routine screening (e.g., EPDS), and structured postpartum counseling, should be incorporated into India's maternal health framework [20].

### RECOMMENDATIONS

Based on the findings of this study, routine screening for postpartum depression should be integrated into standard postnatal care using validated tools such as the Edinburgh Postnatal Depression Scale. Screening should be conducted before hospital discharge and during follow-up visits, particularly within the first six months postpartum. Early identification of high-risk mothers—including those with unplanned pregnancies, low socioeconomic status, preterm

delivery, low birth weight infants, sleep disturbances, and low self-esteem—should prompt timely referral for psychological evaluation and counseling. Maternal mental health services should be incorporated into routine obstetric and pediatric care through a multidisciplinary approach involving obstetricians, pediatricians, and mental health professionals. Antenatal counseling programs should include mental health education, stress management strategies, and family-based support interventions to reduce stigma and improve early recognition of symptoms. At the policy level, maternal mental health screening protocols should be standardized and integrated into national maternal health programs to ensure systematic implementation. Future multicentric longitudinal studies and interventional research are recommended to evaluate long-term outcomes and the effectiveness of structured psychosocial support programs.

### CLINICAL IMPLICATIONS

The findings of this study highlight the importance of incorporating routine mental health assessment into standard postpartum care to ensure early identification and timely management of postpartum depression. Systematic screening using validated tools such as the Edinburgh Postnatal Depression Scale during the immediate postpartum period and subsequent follow-up visits can facilitate early detection of at-risk mothers. Recognition of key risk factors—including low socioeconomic status, unplanned pregnancy, preterm birth, low birth weight, sleep disturbance, and low self-esteem—enables clinicians to implement targeted monitoring and early psychosocial interventions. Integrating mental health services within obstetric and pediatric settings promotes a multidisciplinary approach, improving continuity of care and reducing stigma associated with psychiatric referral. Early intervention not only enhances maternal psychological well-being but also supports optimal mother–infant bonding, breastfeeding practices, and child developmental outcomes. These findings underscore the need for structured referral pathways, clinician training in perinatal mental health, and institutional protocols that prioritize maternal psychological assessment as a routine component of comprehensive postpartum care.

### Study Strengths & Limitations

❖ **Strengths:** This study provides a comprehensive analysis of PPD risk factors in a tertiary care setting and highlights critical gaps in maternal mental health care.

❖ **Limitations:** The study was limited to a single hospital, and follow-up at six months relied on telephonic interviews due to COVID-19, which may have introduced response bias.

### CONCLUSION

This study demonstrates that postpartum depression remains a significant public health concern among women attending tertiary care services, with a considerable proportion of mothers experiencing depressive symptoms during the immediate postpartum period and at six months follow-up. Several sociodemographic, obstetric, and psychosocial factors—including low socioeconomic status, unplanned pregnancy, preterm birth, low birth weight, sleep disturbance, and low self-esteem—were identified as significant predictors, with multivariate analysis confirming their independent association with postpartum depression. The persistence of depressive symptoms over time underscores the need for longitudinal monitoring rather than single-point screening. Routine use of validated screening instruments such as the Edinburgh Postnatal Depression Scale can facilitate early detection and timely intervention. Integrating mental health assessment into standard maternal and child healthcare services, along with targeted psychosocial support for high-risk mothers, is essential to reduce the burden of postpartum depression. Strengthening institutional protocols and policy frameworks to prioritize maternal mental health will contribute to improved maternal well-being, healthier mother–infant relationships, and better long-term developmental outcomes for children.

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### CLINICAL TRIAL

Not Applicable.

### AUTHORS' CONTRIBUTIONS

Supriya Jagdale: Manuscript preparation, literature review & editing.

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## AVAILABILITY OF DATA AND MATERIALS

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request sets generated during the current study are available from the corresponding author on reasonable request.

## DATA AVAILABILITY

The principal investigator can provide data in non-personally identifiable form if requested by the subject.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

As the study did not involve patients or sensitive clinical data and posed minimal risk, formal ethical approval was exempted. Nonetheless, the study adhered to ethical research standards. It followed the guidelines of the Independent Ethics Committee of Symbiosis International University, Pune, India, ensuring the protection and respectful treatment of all participants.

## INFORMED CONSENT

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and informed consent was obtained from all patients for being included in the study.

## CONSENT FOR PUBLICATION

Our manuscript contains no individual person's data in any form.

## COMPETING INTERESTS

The authors have no funding or conflicts of interest to disclose.

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