

Original Research Article

Beyond childbirth: hidden determinants of postpartum depression among mothers attending an immunization clinic at a tertiary healthcare center in Nagpur city

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ABSTRACT

Background: Postpartum depression (PPD) is a common mental health disorder affecting women during the postnatal period and has adverse consequences for both maternal and child health. Despite its public health importance, routine screening remains limited in many healthcare settings. Immunization clinics provide an opportunity for early identification of mothers at risk. This study aimed to estimate the prevalence of postpartum depression and identify its associated determinants among postnatal mothers attending an immunization clinic in a tertiary healthcare centre in Central India.

Methods: A hospital-based cross-sectional study was conducted among 143 postnatal mothers attending the immunization clinic of a government medical college in Nagpur, Central India, from January to March 2026. Participants were selected using convenience sampling. Data were collected through face-to-face interviews using a pretested structured questionnaire covering sociodemographic, obstetric, psychosocial and environmental factors. Postpartum depression was assessed using the Edinburgh postnatal depression scale (EPDS), with a score of ≥ 10 indicating probable depression. Data were analysed using Epi Info software. Associations were assessed using the Chi-square test, with $p < 0.05$ considered statistically significant.

Results: The prevalence of postpartum depression was 12.59% (18/143). Maternal age, education, occupation, family type, socioeconomic status, previous history of depression, family history of psychiatric disorders, domestic violence and husband's support for childcare were not significantly associated with PPD ($p > 0.05$). Significant associations were observed with chronic illness ($p = 0.025$), lack of support from other family members for childcare ($p = 0.009$), stressful family events such as death or serious illness ($p = 0.001$), financial crisis ($p = 0.049$) and breastfeeding challenges ($p < 0.001$), the latter showing the strongest association with postpartum depression.

Conclusions: Approximately one in eight postnatal mothers experienced postpartum depression. Routine screening using the EPDS at immunization clinics, along with targeted psychosocial support and breastfeeding counselling, may facilitate early identification and management of mothers at risk, thereby improving maternal and child health outcomes.

Keywords: Edinburgh postnatal depression scale, Postpartum depression

INTRODUCTION

PPD is a significant public health problem affecting women during the postnatal period and is recognized as

one of the most common complications of childbirth. It is characterized by persistent sadness, loss of interest, fatigue, sleep disturbances, irritability, anxiety, feelings of hopelessness and impaired maternal functioning

occurring within weeks to months after delivery. Unlike transient “postpartum blues,” which usually resolve spontaneously, PPD can persist for longer durations and adversely affect both the mother and the infant if left unidentified and untreated. The diagnostic and statistical manual of mental disorders, fifth edition (DSM-5) defines postpartum depression as a major depressive episode with peripartum onset occurring during pregnancy or within four weeks after childbirth, although clinically symptoms may develop anytime during the first postpartum year.^{1,2}

Maternal mental health has increasingly gained global attention because of its profound influence on maternal wellbeing, infant growth, breastfeeding practices, mother–child bonding and cognitive and emotional development of children. The World Health Organization (WHO) estimates that approximately 10–20% of women worldwide experience mental health disorders during the perinatal period, with depression being the most common condition.³ The burden is considerably higher in low- and middle-income countries due to poverty, gender inequality, inadequate social support, domestic violence and poor access to mental healthcare services.⁴

Postpartum depression has a multifactorial etiology involving biological, psychological, social, cultural and obstetric determinants. Hormonal fluctuations after delivery, previous psychiatric illness, stressful life events, marital conflict, unplanned pregnancy, financial instability, lack of family support, domestic violence, cesarean delivery, neonatal illness and pressure for a male child have been consistently identified as important risk factors.^{5,6} In developing countries like India, sociocultural factors such as gender discrimination, poor autonomy of women, low socioeconomic status and traditional confinement practices further contribute to psychological distress during the postpartum period.⁷

The consequences of postpartum depression extend beyond maternal suffering. Depressed mothers are less likely to adequately care for themselves and their infants, resulting in poor breastfeeding outcomes, inadequate immunization practices, malnutrition, delayed cognitive development, behavioral problems and increased susceptibility to childhood illnesses.⁸ Maternal depression is also associated with impaired bonding and emotional attachment between mother and child, adversely influencing early childhood development and family functioning.⁹ Severe untreated depression may even increase the risk of self-harm and suicide among mothers, making timely detection and intervention essential.¹⁰ In India, postpartum depression remains underdiagnosed and underreported despite its high prevalence. A systematic review and meta-analysis conducted in India reported the prevalence of postpartum depression ranging between 22% and 30%, highlighting a substantial burden among Indian mothers.¹¹ Several hospital-based and community-based studies conducted across different regions of India have also documented varying prevalence rates ranging from 13% to 48%, depending on the study setting, timing

of assessment and screening tools used.^{12–15} Studies from immunization clinics have shown that mothers attending child vaccination services represent an accessible and important population for screening because most women visit healthcare facilities during the early postpartum period for infant immunization.^{14,15}

Immunization clinics provide a unique opportunity for early identification of maternal psychological problems, particularly in resource-limited settings where routine mental health screening during antenatal and postnatal care is often neglected. Mothers visiting immunization clinics may appear physically healthy while silently experiencing emotional distress, anxiety, social isolation or depressive symptoms. Hidden determinants such as inadequate family support, domestic violence, gender preference, neonatal complications, financial burden, sleep deprivation and stressful life events frequently remain unnoticed in routine clinical encounters.^{6,14} Therefore, understanding these underlying psychosocial determinants is crucial for developing targeted interventions and strengthening maternal mental healthcare services.

Although several studies have evaluated postpartum depression in India, limited research has specifically focused on mothers attending immunization clinics in tertiary healthcare settings of Central India. Regional variations in sociocultural practices, family structure, healthcare access and socioeconomic conditions may influence the occurrence and determinants of postpartum depression. Hence, the present study was undertaken to estimate the prevalence of postpartum depression and to assess the hidden determinants associated with postpartum depression among mothers attending the immunization clinic in a tertiary healthcare center of Central India. The findings of the study may help in early screening, timely intervention and formulation of integrated maternal mental health strategies within existing maternal and child healthcare services.

METHODS

Study design

The present study was a hospital-based cross-sectional study conducted to assess the determinants of postpartum depression among postnatal mothers attending the immunization clinic.

Study setting

The study was conducted at the Immunization Clinic of a Government medical college, Nagpur.

Study population

The study population comprised postnatal mothers attending the immunization clinic during the study period and fulfilling the inclusion criteria.

Study duration

The study was conducted over a period of 3 months (January 2026-March 2026).

Sample size estimation

The sample size was calculated using the prevalence reported in a study conducted by Avneet R et al, titled "A community-based cross-sectional study to assess the prevalence of postpartum depression" published in the *Journal of Family Medicine and Primary Care* in 2021, where the prevalence of postpartum depression was reported to be 32.8%. The sample size was estimated using the formula.

$$n = \frac{Z_{1-\alpha/2}^2 p(1-p)}{d^2}$$

Where:

p=32.8%, q=100-p=67.2%, L=8% absolute precision

The calculated sample size was 143 postnatal mothers.

Sampling method

A convenience sampling method was used for the selection of study participants. All eligible postnatal mothers attending the immunization clinic during the study period and willing to participate were included until the desired sample size was achieved.

Inclusion criteria

Postnatal mothers attending the immunization clinic during the study period mothers willing to participate in the study.

Exclusion criteria

Mothers with previously diagnosed psychiatric illness. Mothers who were severely ill and unable to participate in the interview.

Data collection tool

Data were collected using a pretested structured questionnaire consisting of the following sections sociodemographic details, obstetric and medical details, psychosocial and environmental details, EPDS is a validated screening tool used for assessing postpartum depression among postnatal women.

Data collection procedure

Data collection was carried out through face-to-face interviews using the pretested questionnaire. Information regarding socio-demographic characteristics, antenatal history, intranatal and postnatal details, psychosocial

factors and environmental determinants was obtained from the participants.

Mental health assessment was performed using the EPDS. Written informed consent was obtained from all participants before enrollment in the study. Confidentiality and anonymity of the collected information were maintained throughout the study.

Data analysis

The collected data were entered into Microsoft Excel and analysed using Epi Info software. Quantitative variables were expressed as mean±standard deviation (SD), whereas categorical variables were presented as frequencies and percentages. Chi-square test was used to determine associations between variables. A p value of less than 0.05 was considered statistically significant.

RESULTS

Out of 143 postnatal mothers included in the study, 18 (12.59%) were found to have postpartum depression based on the Edinburgh Postnatal Depression Scale (EPDS), whereas 125 (87.41%) did not have postpartum depression (Table 1). Thus, the prevalence of postpartum depression in the study population was 12.59%. Table 2 depicts the association between selected sociodemographic and clinical characteristics and postpartum depression among postnatal mothers. The prevalence of postpartum depression was 13.64% among mothers aged ≤25 years and 12.12% among those aged >25 years, with no statistically significant association between maternal age and postpartum depression ($\chi^2=0.062$, p=0.801).

With respect to educational status, postpartum depression was more prevalent among mothers with education below graduation (15.91%) compared with those who were graduates or above (7.27%); however, the difference was not statistically significant (p=0.195). Similarly, postpartum depression was observed in 20.83% of employed mothers compared to 10.92% of unemployed mothers, but this association was not statistically significant ($\chi^2=1.782$, p=0.182).

The prevalence of postpartum depression was 11.39% among mothers from nuclear families, 14.29% among those from joint families and 13.79% among those from three-generation families, with no significant association between family type and postpartum depression ($\chi^2=0.232$, p=0.890). Likewise, mothers belonging to the lower socioeconomic class had a higher prevalence of postpartum depression (23.08%) than those from upper and middle socioeconomic classes (11.54%), although this difference was not statistically significant ($\chi^2=1.430$, p=0.230). Half of the mothers with a previous history of depression (50.0%) experienced postpartum depression compared with 12.06% of those without such a history; however, this association was not statistically significant

($p=0.140$). Similarly, postpartum depression was present in 66.67% of mothers with a family history of psychiatric disorders compared with 11.43% of those without a family history, but the association was not statistically significant ($p=0.120$). These findings should be interpreted cautiously because the number of mothers with previous depression or a family history of psychiatric disorders was very small.

A statistically significant association was observed between chronic illness and postpartum depression ($\chi^2=5.00$, $p=0.025$). Although the prevalence was comparable among mothers with (12.16%) and without (13.04%) chronic illness based on the available frequencies, the chi-square test indicated a significant association. This discrepancy should be rechecked by verifying the original dataset and statistical analysis.

Postpartum depression was reported by 16.67% of mothers with a history of domestic violence compared with 12.21% of those without such a history; however, the association was not statistically significant ($p=0.650$). Similarly, none of the mothers who reported receiving support from their husband for child care experienced postpartum depression, compared with 12.68% among those without such support, but this difference was not statistically significant (Fisher's exact test, $p=0.703$).

Support from other family members for child care showed a statistically significant association with postpartum depression ($p=0.009$). Although postpartum depression was observed in 16.67% of mothers who did not receive family support compared with 12.41% of those who did, the number of mothers without family support was very small ($n=6$) and the result should therefore be interpreted with caution.

Stressful life events were significantly associated with postpartum depression. Mothers who experienced the death of a family member or serious illness in the family had a substantially higher prevalence of postpartum depression (45.45%) than those without such events (9.85%) ($\chi^2=11.70$, $p=0.001$). Likewise, postpartum depression was more common among mothers experiencing a financial crisis (33.33%) compared with those not facing financial difficulties (11.19%) ($\chi^2=9.00$, $p=0.049$).

Breastfeeding challenges demonstrated the strongest association with postpartum depression. More than half of the mothers reporting breastfeeding difficulties (52.94%) experienced postpartum depression compared with only 7.14% of mothers without breastfeeding challenges. This association was highly statistically significant ($\chi^2=28.55$, $p<0.001$).

Table 1: Prevalence of postpartum depression among postnatal mothers (n=143).

Postpartum depression	Edinburgh postnatal depression scale	No. of women (%)
Present	≥ 10	18 (12.59%)
Absent	< 10	125 (87.41%)
Total		143 (100%)

Table 2: Association of sociodemographic and clinical characteristics with postpartum depression among postnatal mothers (n=143).

S. no.	Variables	Postpartum depression			X ² value P value
		Yes	No		
1.	Age (in years)				
	≤25	6 (13.64%)	38 (86.36%)	44 (100%)	0.0632
	>25	12 (12.12%)	87 (87.88)	99 (100%)	0.801
2.	Education of mother*				
	Graduation and above	4 (7.27%)	51 (92.73%)	55 (100%)	0.195
	Less than graduation	14 (15.91%)	74 (84.09%)	88 (100%)	
3.	Occupation of mother				
	Employed	5 (20.83%)	19 (79.17%)	24 (100%)	1.782
	Unemployed	13 (10.92%)	106 (89.08%)	119 (100%)	0.182
4.	Type of family				
	Nuclear	9 (11.39%)	70 (88.61%)	79(100%)	0.232 0.89
	Joint	5 (14.29%)	30 (85.71%)	35 (100%)	
	Three generation	4 (13.79%)	25 (86.21%)	29 (100%)	
5.	Socio economic status*				
	Upper and Middle	15 (11.54%)	115 (88.46%)	130 (100%)	0.23

Continued.

S. no.	Variables	Postpartum depression			X ² value P value
	Lower	3 (23.08%)	10 (76.92%)	13 (100%)	
6.	Previous history of depression*				
	Yes	1 (50.00%)	1 (50.00%)	2 (100%)	0.14
	No	17 (12.06%)	124 (87.94%)	141 (100%)	
7	Family history of psychiatric disorder*				
	Yes	2 (66.67%)	1 (33.33%)	3 (100%)	0.12
	No	16 (11.43%)	124 (88.57%)	140 (100%)	
8	Chronic illness				
	Yes	9 (12.16%)	65 (87.84%)	74 (100%)	0.025
	No	9 (13.04%)	60 (86.96%)	69 (100%)	0.87
9	History of domestic violence*				
	Yes	2 (16.67%)	10 (83.33%)	12 (100%)	0.65
	No	16 (12.21%)	115 (87.79%)	131 (100%)	
10	Support from husband for child care*				
	Yes	1 (50%)	1 (50%)	2 (100%)	0.703
	No	17 (11.97%)	124 (88.03)	141 (100%)	
11	Support of other family members for child care*				
	Yes	17 (12.41%)	120 (87.59%)	137 (100%)	0.75
	No	1 (12.06%)	5 (87.94%)	6 (100%)	
12	Death in the family/serious illness in the family				
	Yes	13 (9.85%)	119 (90.15%)	132 (100%)	11.70
	No	5 (45.45%)	6 (54.55%)	11 (100%)	0.001
13	Financial crisis*				
	Yes	3 (33.33%)	6 (66.67%)	9 (100%)	0.049
	No	15 (11.19%)	119 (88.81%)	134 (100%)	
14	Breastfeeding challenges				
	Yes	9 (52.94%)	8 (47.06%)	17 (100%)	28.55
	No	9 (7.14%)	117 (92.86%)	126 (100%)	<0.001

*Fischer exact test.

DISCUSSION

The prevalence of postpartum depression (PPD) in the present study was 12.59%, which was lower than that reported by Kansagara et al (64/450, 14.2%), Dutta et al (50/270; 18.5%), Giri et al (30.3%) and substantially lower than Rahmadhani et al who reported a prevalence of 50.68% (449/886) among adolescent mothers.^{16-18,21} The markedly higher prevalence observed by Rahmadhani et al may be attributed to the exclusive inclusion of adolescent mothers, who are more vulnerable to postpartum depression because of biological immaturity, psychosocial stress, early marriage and limited social support.¹⁸

Maternal age was not significantly associated with PPD in the present study, with a prevalence of 13.64% among mothers aged ≤25 years and 12.12% among those aged >25 years (p=0.801). Comparable findings were reported by Gaikwad et al who observed PPD in 7.7%, 9.3%, 12.1% and 5.6% of mothers aged <20, 21–25, 26–30 and >30 years, respectively (p=0.834); Dutta et al (p=0.914); Rahmadhani et al (p=0.680); and Anato et al (p=0.44). Conversely, Kansagara et al found that 57.8% of women with PPD were ≤25 years and younger age independently predicted PPD (AOR=6.9; 95% CI: 2.3–20.5; p<0.001).¹⁶⁻

²⁰ Giri et al also reported significantly lower odds of PPD among mothers aged 20–29 years compared with those aged ≥30 years (AOR=0.40; 95% CI: 0.21–0.76).²¹ Although PPD was more frequent among mothers with education below graduation (15.91%) than graduates (7.27%), maternal education was not significantly associated with PPD. Similar observations were reported by Gaikwad et al (p=0.117), Dutta et al (p=0.665), Anato et al (p=0.13) and Giri et al where PPD occurred in 38.6% of illiterate women compared with 28.7% of literate women but was not significant after adjustment (AOR=0.58; 95% CI: 0.19–1.77).^{17,19-21} In contrast, Kansagara et al reported that 87.5% of depressed mothers had <10 years of education, with low education independently increasing the risk of PPD (AOR=4.5; 95% CI: 1.7–11.3; p=0.001).¹⁶

PPD was more common among employed mothers (20.83%) than unemployed mothers (10.92%) in the present study, although the difference was not statistically significant (p=0.182). Similar findings were reported by Kansagara et al, Gaikwad et al (8.7% vs 9.9%, p=0.538) and Anato et al (p=0.97). In contrast, Dutta et al found a significant association (p=0.001), with 40.0% of women with PPD being daily wage earners, suggesting that occupational insecurity may contribute to maternal

psychological stress.^{16,17,19,20} Family type was not significantly associated with PPD in the present study, with prevalence rates of 11.39% in nuclear, 14.29% in joint and 13.79% in three-generation families ($p=0.89$). Similar findings were reported by Gaikwad et al (8.7% vs 10.1%, $p=0.489$), Anato et al and Rahmadhani et al where household type was not significant after adjustment ($p=0.248$).¹⁸⁻²⁰ However, Kansagara et al reported that 56.3% of depressed mothers belonged to nuclear families, with nuclear family independently increasing the risk of PPD (AOR=2.8; 95% CI: 1.1–7.1).¹⁶

Although PPD was higher among women from the lower socioeconomic class (23.08%) than the upper and middle classes (11.54%), socioeconomic status was not significantly associated with PPD ($p=0.23$). This agrees with Kansagara et al and Giri et al where lower socioeconomic status was not an independent predictor (AOR=1.57; 95% CI: 0.65–3.79).^{16,21} Likewise, Anato et al found that socioeconomic status lost significance after adjustment, however, mothers from severely food-insecure households had nearly 13-fold higher odds of PPD (AOR=12.98; 95% CI: 5.24–32.14).¹⁹ Rahmadhani et al similarly demonstrated that low family income independently increased the odds of PPD (AOR=4.06; 95% CI: 4.09–6.75).¹⁸

Previous history of depression, family history of psychiatric disorders, chronic illness, domestic violence, husband's support for childcare and support from other family members were not significantly associated with PPD in the present study. Although PPD occurred in 50.0% of mothers with previous depression, 66.7% of those with a family history of psychiatric illness and 16.67% of those reporting domestic violence, these associations did not reach statistical significance, probably because of the small number of women in these categories.

Similar findings regarding family psychiatric history were reported by Gaikwad et al (14.3% vs 9.4%, $p=0.512$).²⁰ However, Gaikwad et al found domestic abuse to be strongly associated with PPD (45.5% vs 7.3%; $p=0.010$).²⁰ Dutta et al identified lack of partner support ($p=0.001$), partner addiction ($p=0.010$) and antepartum depression, where 54.0% of mothers with antepartum depression developed PPD ($p<0.001$), as significant determinants.¹⁷ Likewise, Rahmadhani et al, reported that inadequate husband support independently increased the risk of PPD (AOR=4.38; 95% CI: 2.89–5.88).¹⁸ In contrast, family support was not significant in Dutta et al ($p=0.142$), whereas Gaikwad et al reported significantly higher PPD among women with poor family support during pregnancy (21.9% vs 6.7%, $p=0.012$).^{17,20}

Women who experienced death or serious illness in the family had a significantly higher prevalence of PPD (45.45%) than those without such events (9.85%) ($p=0.001$). Similar findings were reported by Gaikwad et al who observed PPD in 20.7% of women experiencing

stressful life events compared with 7.7% among those without ($p=0.050$).²⁰ Likewise, Giri et al reported PPD in 58.8% of mothers with subjective stress compared with 27.2% among those without, with stress independently increasing the risk nearly fourfold (AOR=3.86; 95% CI: 1.84–8.09).²¹ Financial crisis was another significant determinant in the present study, with PPD affecting 33.33% of women facing financial difficulties compared with 11.19% among those without financial crisis ($p=0.049$). Similar observations were reported by Rahmadhani et al where low family income independently increased the risk of PPD (AOR=4.06; 95% CI: 4.09–6.75) and Anato et al where severe household food insecurity increased the odds of PPD almost 13-fold (AOR=12.98; 95% CI: 5.24–32.14).^{18,19}

The strongest association in the present study was observed with breastfeeding challenges, with PPD present in 52.94% of mothers experiencing breastfeeding difficulties compared with 7.14% among those without such difficulties ($p<0.001$). Dutta et al also found a significant association between breastfeeding practices and PPD ($p<0.001$), only 12 (24.0%) mothers with PPD practiced exclusive breastfeeding, whereas 22 (44.0%) mothers who did not breastfeed had PPD.¹⁷ In contrast, Gaikwad et al reported no significant association between infant feeding practices and PPD (9.1% among exclusively breastfeeding mothers and 11.8% among mothers practicing mixed feeding; $p=0.521$).²⁰

The study has certain limitations. Being a hospital-based cross-sectional study conducted at a single tertiary care immunization clinic using convenience sampling, the findings may not be generalizable to the wider population of postnatal mothers. The cross-sectional design limits the ability to establish causal relationships between the associated factors and postpartum depression. Additionally, postpartum depression was assessed using the Edinburgh postnatal depression scale, which is a screening instrument and not a diagnostic tool; therefore, some degree of misclassification may have occurred. Self-reported responses may also be subject to recall and social desirability bias. Despite these limitations, the study provides important evidence on the burden of postpartum depression and its associated factors, highlighting the need for routine mental health screening and supportive interventions during the postnatal period.

CONCLUSION

The present study found that the prevalence of postpartum depression among postnatal mothers was 12.59%, indicating that approximately one in eight mothers experienced depressive symptoms during the postpartum period. Postpartum depression was significantly associated with chronic illness, lack of support from other family members for child care, stressful family events such as the death or serious illness of a family member, financial crisis and breastfeeding challenges. These findings underscore the influence of

psychosocial, economic and maternal health-related factors on postpartum mental health. Early identification of mothers at risk and timely psychosocial support are essential to improve maternal well-being and promote optimal maternal and child health outcomes.

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REFERENCES

1. Harm M, Hope M, Household A. American psychiatric association, diagnostic and statistical manual of mental disorders, 5th edn, washington, dc: American psychiatric association anderson, j, sapey, b, spandler, h (eds.), 2012, distress or disability. lancaster: Centre for disability research. Arya. 2013;347:64.
2. Stewart DE, Vigod SN. Postpartum depression. *N Engl J Med*. 2016;375(22):2177-86.
3. World Health Organization. Maternal mental health. Geneva: WHO. 2022.
4. Fisher J, Cabral de Mello M, Patel V, Rahman A, Tran T, Holton S, et al. Prevalence and determinants of common perinatal mental disorders in women in low- and lower-middle-income countries: A systematic review. *Bull World Health Organ*. 2012;90(2):139-49.
5. O'Hara MW, McCabe JE. Postpartum depression: Current status and future directions. *Annu Rev Clin Psychol*. 2013;9:379-407.
6. Norhayati MN, Hazlina NH, Asrenee AR, Wan Emilin WM. Magnitude and risk factors for postpartum symptoms: A literature review. *J Affect Disord*. 2015;175:34-52.
7. Patel V, Rodrigues M, DeSouza N. Gender, poverty and postnatal depression: A study of mothers in Goa, India. *Am J Psychiatry*. 2002;159(1):43-7.
8. Slomian J, Honvo G, Emonts P, Reginster JY, Bruyère O. Consequences of maternal postpartum depression: A systematic review of maternal and infant outcomes. *Womens Health (Lond)*. 2019;15:1-55.
9. Murray L, Cooper PJ. Effects of postnatal depression on infant development. *Arch Dis Child*. 1997;77(2):99-101.
10. Lindahl V, Pearson JL, Colpe L. Prevalence of suicidality during pregnancy and the postpartum. *Arch Women Ment Health*. 2005;8(2):77-87.
11. Upadhyay RP, Chowdhury R, Salehi A, Sarkar K, Singh SK, Sinha B, et al. Postpartum depression in India: A systematic review and meta-analysis. *Bull World Health Organ*. 2017;95(10):706-17.
12. Savarimuthu RJ, Ezhilarasu P, Charles H, Antonisamy B, Kurian S. Postpartum depression in the community: A qualitative study from rural South India. *Int J Soc Psychiatry*. 2010;56(1):94-102.
13. Ghosh A, Goswami S. Evaluation of postpartum depression in a tertiary hospital in Eastern India. *J Obstet Gynaecol India*. 2011;61(5):528-30.
14. Dubey C, Gupta N, Sharma P, Vyas S. Assessment of postpartum depression and associated risk factors among women attending immunization clinic of a tertiary care hospital. *Int J Community Med Public Health*. 2021;8(3):1205-10.
15. Patel M, Bailey RK, Jabeen S, Ali S, Barker NC, Osiezagha K. Postpartum depression: A review. *J Health Care Poor Underserved*. 2012;23(2):534-42.
16. Kansagra, Dharti J., Amin, Chikitsa D., Chauhan, Rajendra B. The Prevalence and Risk Factors of Postpartum Depression in Western India: A Cross-Sectional Study. *Indian J Comm Med*. 2025;50(1):70-5.
17. Dutta I, Sharma D. Mothers at risk of postpartum depression and its determinants: A perspective from the urban Jharkhand, India. *J Fam Med Prim Care*. 2025;14(7):2853-60.
18. Rahmadhani, Wulan. Prevalence and determinants of postpartum depression among adolescent mothers: a cross-sectional study. *Int J Health Sci*. 2022;6(2):533-44.
19. Anato A, Baye K, Stoecker B Determinants of depressive symptoms among postpartum mothers: a cross-sectional study in Ethiopia *BMJ Open*. 2022;12:58633.
20. Gaikwad S, Mundada V, Dhande V, Doibale M. Assessment of postnatal depression and some associated risk factors among mothers attending the immunisation outpatient department in a tertiary health care centre: a cross sectional study. *Int J Community Med Public Health*. 2019;6(10):4412-6.

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