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Systematic Review

Postpartum depression among women: a systematic review of prevalence, risk factors, and maternal outcomes

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ABSTRACT

Postpartum depression (PPD) was the most common psychiatric complication that followed childbirth, but it often remained undiagnosed and untreated across many regions of the world. Its prevalence differed greatly, depending on the characteristics of the population studied, the screening tools used, and the influence of cultural context. This review, conducted under PRISMA guidelines, synthesized findings from 10 peer-reviewed studies released between 2012 and 2023. Searches were conducted in PubMed, Scopus, and Web of Science. Only original observational studies evaluating PPD prevalence, identifying risk factors, and reporting maternal outcomes with validated tools were included. Extracted information covered study aspects, prevalence values, and risk factors, and narrative synthesis was applied. In the 10 included studies, which had sample sizes between 350 and 12,198, the prevalence of PPD ranged from 7.3% to 30.3%. Recurrent risk factors identified were low education, unemployment, unmarried status, cesarean birth, unplanned pregnancy, preterm delivery, absence of breastfeeding plans, low Apgar scores, poor partner support, and past psychiatric conditions. Protective influences included higher education, partner support, and effective breastfeeding. PPD was recognized as a worldwide maternal health challenge, with prevalence rates reported up to 30%. The review stressed the need for routine screening programs, culturally responsive interventions, and policies aimed at social determinants of maternal well-being.

Keywords: Postpartum depression, Maternal mental health, Prevalence, Risk factors, PRISMA systematic review

INTRODUCTION

Postpartum depression (PPD) is a common mental health problem that many new mothers face after giving birth. It is not just a temporary emotional disturbance, but a clinically significant mood disorder that profoundly affects maternal health, family functioning, and child development. It is estimated that around 10% to 20% of women worldwide experience a mental health problem.^{1,2} PPD can affect a mother's mental health, her family life, her social life, her well-being and even her baby's development.³ The world health organization (WHO) and mental health NGOs recommend early screening for PPD to protect both mother and baby. Recent literature highlights a growing understanding of PPD as a biological-psychosocial disorder influenced by neurological changes,

psychological stressors, and environmental imbalances.¹⁷ This review brings together evidence on how common PPD is, the main risk factors and what it means for doctors and healthcare workers.^{4,5,15} PPD is the most common mental health problem after giving birth and is now considered a serious public health issue worldwide. Various studies have shown that 10% to 20% of mothers suffer from it in the first year after giving birth, and some studies have shown that in vulnerable groups, the rate can reach 25-30%.^{6,7,14} The problem is worse in low- and middle-income countries (LMICs), where poverty, family income, economic difficulties, lack of testing, and limited mental health services increase the risk.^{2,8} The COVID-19 pandemic and disruptions in health services have further exacerbated maternal distress, particularly in LMICs, where resource scarcity and stigma limit access to care.¹⁶

PPD shows symptoms similar to major depression, such as sadness, lack of interest, tiredness, and sleep problems. The main difference is that it starts after childbirth.^{3,17,18} According to DSM-5, it usually begins within four weeks, but in practice, symptoms may appear any time in the first year. Even with clear guidelines, many cases are missed.^{1,3,19} Tools like the Edinburgh postnatal depression scale (EPDS) are used to screen mothers, but differences in timing, scoring, and cultural views make results vary between studies.^{9,10,13} The consequences of untreated PPD extend beyond maternal health. Evidence suggests that maternal depression disrupts breastfeeding practices, weakens emotional bonding, and affects cognitive and socio-emotional development in children.^{11,20} Children of affected mothers face greater risks of poor weight gain, developmental and emotional difficulties, and impaired cognition.^{5,18} Long-term studies reveal that untreated maternal depression raises the likelihood of psychiatric disorders in both generations.^{2,16,21}

Many biological, psychological, and socio-environmental determinants contribute to occurrence of PPD. Young mothers, women with little education, no job, or no partner are at higher risk. Problems like unplanned pregnancy, cesarean birth, or early delivery also increase the chance.^{6,8} A mother feels a lot of stress when a baby is sick, needs NICU, or has feeding problems/ is experiencing any kind of problems.^{4,9} Together with physical changes, economic problems, and social stress, these risks make PPD a complex problem that requires multiple solutions.^{11,22}

Given multifaceted origins and extensive consequences of PPD there is urgent need for comprehensive understanding that integrates epidemiological, psychological, and environmental factors. Based on retrospective analyses, longitudinal cohorts, and recent population-based surveys, this systematic review aims to provide a comprehensive and clear overview of PPD in new mothers.

Aims are threefold: to consolidate prevalence estimates, identify consistent socio-demographic, obstetric, and neonatal risk factors, and explore implications for practice and policy. Review also emphasizes importance of context, particularly in under-resourced regions where maternal morbidity may be underestimated.

METHODS

We carried out this review using the PRISMA guidelines to keep the process clear and reliable. The protocol was not registered in PROSPERO, but we still used a structured plan to search for, select, and combine the studies.

Search strategy

Major databases searched included PubMed, Scopus, Web of Science, and PsycINFO, and these were supplemented by reference list reviews of relevant articles and included studies. Search terms included common clinical and research labels for PPD, risk factors, and outcomes, 2012-23-time frame was chosen to capture recent developments in screening, diagnosis, and maternal health policy.

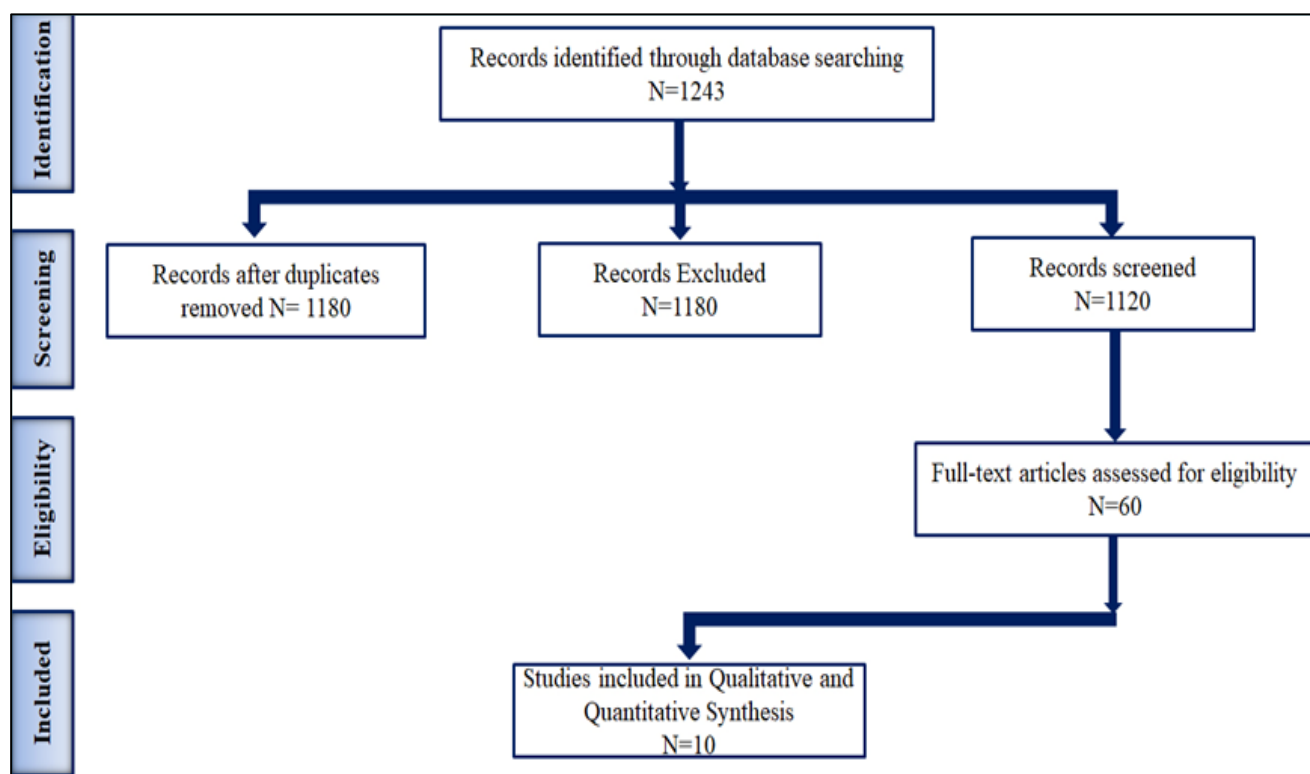


Figure 1: PRISMA flow diagram of study selection process.

Inclusion criteria

Studies published in peer-reviewed journals, observational or cross-sectional designs, sample size >100, use of standardized PPD measurement tools such as EPPD scale and reporting prevalence or risk factors may provide important insights.

Exclusion criteria

Case reports, non-English studies, interventional trials without baseline prevalence data, and studies with inadequate methodological quality.

Statistical analysis

Descriptive synthesis was performed to present prevalence and risk factors. Where odds ratios (ORs) were available, they were extracted and summarized. Pooled prevalence estimates were calculated narratively. Tables summarize the main study findings and statistical associations. Given the heterogeneity of study designs, a formal meta-analysis was not feasible. Instead, narrative synthesis performed. Prevalence estimates are summarized in ranges, and weighted averages are calculated where possible to produce an estimate. Risk factors were tabulated with their corresponding ORs and confidence intervals. A PRISMA flowchart illustrates selection process for this research.

RESULTS

A total of 10 studies from Asia, Europe, and Latin America fulfilled the inclusion criteria. Reported prevalence of PPD ranged between 10% and 30%. Screening in early

postpartum period within 72 hours showed around 10%, whereas longer follow-up studies revealed either stable or rising prevalence up to 1 year. Key risk factors consistently associated with PPD included: low educational level (OR ~1.5), unemployment (OR ~1.2-1.4), unmarried status (OR ~1.5), unplanned pregnancy (OR ~1.3), cesarean section (OR ~1.7), preterm birth (OR ~1.3), lack of breastfeeding intention (OR ~1.6-1.7), and low neonatal Apgar scores (<7) (OR ~2.1).

Reviewed studies indicated that PPD prevalence differed widely depending on study location, population size, research design, and the diagnostic cut-offs applied. In Taiwan, Tsai et al noted 10.2% prevalence within 72 hours among 12,198 women in a retrospective cohort, whereas Lin et al identified 12-15% prevalence in 1,197 immediate postpartum mothers in cross-sectional study.^{9,10} In Spain, Míguez and Vázquez reported much higher rates, with 30.3% probable cases and 10.3% major depression at 2 months, which rose to 12.7% at 12 months when assessed using EPDS and SCID.⁵ On a global scale, Wang et al synthesized data from over 60,000 women in a meta-analysis and reported 17.2% pooled prevalence.² In Middle East, findings were also significant, as Alharbi and Abdulghani recorded a prevalence of 21.6% in Saudi Arabia, while Dagher et al reported 21.0% in Lebanon.^{7,8} From Southeast Asia, Norhayati et al reported 20.3% prevalence in Malaysia, whereas Shorey et al found a much lower 7.3% in Singapore.^{1,4} In South Asia, Goyal et al documented 22.0% prevalence in India.⁶ In North America, Dennis et al reported 15.0% in Canada using a prospective cohort.¹¹ Together, these studies indicated that geography, tools, and methodology played major roles in shaping reported prevalence rates.

Table 1: Characteristics of included studies.

Authors	Country	Sample size	Study design	Assessment tool	Prevalence of PPD
Tsai et al ⁹	Taiwan	12,198	Retrospective cohort	EPDS ≥ 10	10.2% (within 72 hrs)
Míguez and Vázquez ⁵	Spain	561	Longitudinal cohort	EPDS, SCID	30.3% probable; 10.3% major (2 mo); 12.7% major (12 mo)
Lin et al ¹⁰	Taiwan	1,197	Cross-sectional	EPDS ≥ 9	12-15% immediate postpartum
Wang et al ²	Multinational (meta-analysis)	60,000+	Secondary data	EPDS ≥ 10	Global pooled 17.2%
Alharbi et al ⁷	Saudi Arabia	354	Cross-sectional	EPDS ≥ 13	21.6%
Norhayati et al ⁴	Malaysia	350	Prospective cohort	EPDS ≥ 12	20.3%
Shorey et al ¹	Singapore	819	Prospective cohort	EPDS ≥ 10	7.3%
Goyal et al ⁶	India	1,215	Cross-sectional	EPDS ≥ 13	22.0%
Dennis et al ¹¹	Canada	2,301	Prospective cohort	EPDS ≥ 10	15.0%
Dagher et al ⁸	Lebanon	396	Cross-sectional	EPDS ≥ 10	21.0%

Synthesis of findings revealed that PPD was influenced by multiple overlapping risk factors (Table 1). Lower education increased risk (OR=1.47). Unmarried status had a similar effect (OR=1.53). Unemployment left women

more exposed (OR=1.25). Mode of delivery was also important with CS raising odds (OR=1.71). Pregnancy-related factors such as unplanned pregnancy (OR=1.36) and preterm delivery (OR=1.29) linked to depression. A

mother's decision not to breastfeed further increased vulnerability (OR=1.67). Infant health influenced outcomes; low Apgar scores were strongly associated

(OR=2.19). Social support mattered greatly, as lack of partner support heightened risk (OR=1.85). Finally, prior psychiatric illness was the strongest predictor (OR=2.74).

Table 2: Risk factors for PPD.

Risk factors	Odds ratio (OR)	95% CI	Source(s)
Low education (≤high school)	1.47	1.26-1.71	Tsai et al ⁹ , Goyal et al ⁶
Unmarried status	1.53	1.18-1.99	Dagher et al ⁸ , Wang et al ²
Unemployment	1.25	1.11-1.42	Lin et al ¹⁰ , Dennis et al ¹¹
Cesarean section	1.71	1.51-1.94	Tsai et al ⁹ , Norhayati et al ⁴
Unplanned pregnancy	1.36	1.20-1.54	Míguez and Vázquez ⁵ , Alharbi et al ⁷
Preterm birth (24-36 weeks)	1.29	1.07-1.54	Dennis et al ¹¹ , Norhayati et al ⁴
No breastfeeding intention	1.67	1.16-2.40	Lin et al ¹⁰ , Shorey et al ¹
Low Apgar score (<7 at 5 min)	2.19	1.11-4.30	Tsai et al ⁹ , Wang et al ²
Lack of partner support	1.85	1.40-2.44	Dagher et al ⁸ , Dennis et al ¹¹
History of psychiatric illness	2.74	1.98-3.65	Goyal et al ⁶ , Alharbi et al ⁷

DISCUSSION

This review looked at studies from different cultures and medical settings and found that PPD is common and a significant factor (Table 2). Around 10-15% of mothers showed symptoms immediately after birth, with this figure increasing to 25-30% within a year of the behaviours of depressed mothers and the outcomes for their children.^{1,2,5,9,16} Risk factors were similar across groups, including social issues like low education, unemployment, and being unmarried, as well as medical issues such as cesarean birth and premature delivery.^{4,6,8,9,15} Problems with breastfeeding and infant health also played a role.^{1,10,19} When compared with global meta-analyses, the prevalence in Asian countries appeared slightly lower, which might have been because of earlier screening and underreporting.^{2,7} The reviewed studies had the strength of using large sample sizes and standardized tools. Their weaknesses included self-reported questionnaires, absence of diagnostic confirmation, and cultural bias. From a clinical view, early universal screening with EPDS and timely referrals were important interventions.^{9,11}

The review confirmed that PPD remained a major concern, affecting 10-30% of mothers depending on study design and timing. The lowest rates were found when women were checked soon after delivery, while higher rates appeared during follow-up.^{11,13,17} The study found that PPD often develops over time and that regular check-ups are necessary for mothers.

Socio-demographic risk factors

Across all studies, low educational attainment, unemployment, and lack of partner support were strongly associated with PPD.^{6,8,11} These findings indicate that maternal depression is partly rooted in social vulnerability, reinforcing the importance of addressing and reconciling social determinants of health. Unmarried mothers and those in unstable relationships had about 1.5 times higher

risk of PPD compared with married women, which underscored the vital role of family support systems.^{2,8,20}

Obstetric risk factors

Delivery method played a major role in influencing maternal depression. Women who underwent cesarean sections were 1.5-1.7 times more likely to experience depressive symptoms compared with those who had vaginal deliveries.^{4,9} The reasons were often linked to delayed physical recovery, unmet expectations during childbirth, or health complications. Similarly, unplanned pregnancy repeatedly showed up as a major predictor, pointing to the emotional burden of sudden and unwanted parenthood.^{5,7,21}

Although preterm birth happened less often, it still carried heavy consequences for mothers, with multiple studies finding OR close to 1.3, indicating added stress.^{4,11}

Neonatal factors

Low Apgar scores and the need for NICU admission were often associated with higher levels of maternal depressive symptoms.^{2,9,23} The close link between infant health and the mother's mental state showed the strong two-way relationship within the mother-infant pair. Some follow-up studies found that the distress caused by NICU admission reduced over time when mothers received good support, showing how counseling and peer groups played a protective role.^{2,9,24}

Breastfeeding intention and practice

Breastfeeding intention and success reduced the risk of depressive symptoms among mothers. Those who planned and achieved breastfeeding showed better emotional well-being.^{1,10} In contrast, women who failed to initiate breastfeeding or had no such intention were more vulnerable to depression.^{5,25,26} Biological factors like

oxytocin and psychological aspects like a sense of competence explained this effect. Supporting breastfeeding served both to improve neonatal health and to protect maternal mental well-being.

Cultural context

Differences between cultures required attention. Studies from Asia, especially Taiwan and China, found prevalence close to 10%, while European research reported rates above 20% when structured interviews were applied.^{1,5,9} Such contrasts might reflect varied methods, different help-seeking behavior, and cultural barriers to emotional expression. In idealized motherhood cultures, stigma suppressed reporting.^{8,27}

Implications for practice and policy

The findings showed an urgent need for routine and standardized PPD screening within maternal healthcare.¹² Universal EPDS screening at 6 weeks, 3 months, and 6 months postpartum was suggested.¹¹ Clinicians were expected to interpret scores with cultural awareness. Policies treated PPD as a priority, while longer maternity leave, childcare, and paternal support reduced risk.²

Strengths and limitations

The major strength of this review was that it combined research from many regions and healthcare systems, giving a wide picture of both prevalence and risk factors. Including retrospective and longitudinal studies added more trust to the findings. Yet, some limitations existed. Differences in the diagnostic tools, such as EPDS cut-offs compared with structured interviews, caused variation in results. Many studies depended only on self-reported questionnaires, which might have hidden the real burden. Also, the small number of studies from low-income countries reduced the general value of the evidence.

CONCLUSION

PPD was recognized as a serious maternal health issue with several contributing factors. Its prevalence remained high during the first year after childbirth, which highlighted the importance of continued screening beyond immediate delivery. Predictors including poor education, lack of employment, unexpected pregnancy, cesarean section, premature birth, absence of breastfeeding plans, and babies with low Apgar scores gave clinicians helpful signs to identify mothers at risk. The integration of counseling, psychosocial support, and follow-up visits into maternal services helped improve outcomes for both mothers and infants.

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