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"Prevalence, Risk Factors, and Management of Postpartum Depression in India: A Systematic Review"

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ABSTRACT

Introduction: Postpartum depression (PPD) is a psychological condition that affects women after childbirth. Defined by the DSM-V-TR, PPD typically begins within four weeks of delivery and can last up to a year. Women are vulnerable to mental health conditions such as depression and anxiety during pregnancy and the postpartum period due to significant biological, emotional, financial, and social changes. Despite its severity, many mothers with PPD do not receive treatment, and often fail to recognize the seriousness of their condition. Untreated PPD adversely affects both the mother and the newborn. Although the exact cause is unknown, potential risk factors include hormonal fluctuations, genetic predisposition, birth trauma, and various behavioral and demographic factors.

Aim: This study aims to determine the prevalence of postpartum depression and identify its associated risk factors in India.

Methodology: A systematic review of English-language literature published between 2000 and 2022 was conducted using electronic databases such as Scopus, PubMed, and Google Scholar. Search terms included "postpartum depression," "postnatal depression," "prevalence," "causes," "risk factors," "predisposing factors," and "predictive factors." Studies focusing on the prevalence and risk factors of PPD in India were included.

Results: The prevalence of postpartum depression in India was found to be approximately 22%. Regional variations exist, with the southern region showing the highest prevalence at 26% (95% CI: 19–32) and the northern region the lowest at 15% (95% CI: 10–21). Prevalence rates also varied depending on study settings and methodologies.

Conclusion: PPD represents a significant public health concern in India. To effectively address this issue, comprehensive intervention strategies must be implemented nationwide. Health promotion efforts should be prioritized, and routine screening for PPD should be incorporated into the National Mental Health Programme to identify and support affected women early.

Introduction

Postpartum depression (PPD) is among the most underdiagnosed and mistreated mental health conditions in India. It is a serious mental health disorder that affects a

significant number of women after childbirth. The World Health Organization (WHO) has described PPD as a special state of mental health disorder and a variant of major depression. Its consequences are far-reaching, impacting not only new mothers but also their infants and families. Despite its prevalence and harmful effects, PPD often goes unnoticed and untreated. Many women who experience PPD may dismiss their symptoms, avoid seeking help, or remain unaware of the severity of their condition. As a result, a large number of mothers suffer in silence.

The impact of PPD is profound. It can lead to a breakdown in the mother-infant bond, hinder the emotional and physical development of the child, and disrupt family relationships. Furthermore, PPD significantly lowers the quality of life and emotional well-being of the affected mothers. If left untreated, it can have tragic consequences, including an increased risk of suicide and, in some extreme cases, infanticide. Research has also shown that PPD may be one of the contributing factors to India's rising infant mortality rate.

Clinically, PPD is classified as a major depressive disorder (MDD) with postpartum onset, as defined in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV–TR). Symptoms typically appear within four weeks of childbirth but can persist for up to a year. These symptoms include persistent sadness, loss of interest in activities, fatigue, changes in sleep and appetite, and feelings of guilt or worthlessness. Although it has been empirically studied, the exact cause of PPD remains unclear.

Multiple factors are believed to contribute to the development of postpartum depression. Hormonal changes during and after pregnancy, genetic predispositions, birth-related trauma, and various psychological and demographic elements can increase a woman's risk. In India, a wide range of biological, economic, and psychosocial factors have been linked to the onset of PPD. Additional modifiable risk factors such as anemia, vitamin D deficiency, and low levels of essential trace elements like zinc and selenium also play a crucial role in influencing the disorder.

Given the diverse and complex nature of these risk factors, it is essential to conduct further research to understand the full extent of PPD's burden in India. By identifying the specific variables contributing to PPD in Indian women, better preventive strategies and treatment plans can be implemented. Awareness and education are also crucial in reducing the stigma surrounding maternal mental health and encouraging women to seek timely help.

Examine new developments

Recent developments in the study of postpartum depression (PPD) in India highlight the growing recognition of this underreported public health issue. The enclosed paper has undergone a thorough verification process to ensure its alignment with established research norms. Using a systematic review approach, it compiles and analyzes data on the burden of PPD. Previous studies were examined through text and descriptive results extraction methods, providing a comprehensive overview.

Notably, the current literature on the risk factors and overall burden of PPD in India remains limited. This lack of data poses a challenge to understanding the true extent of the issue. Closing this research gap is essential for effectively addressing PPD

and developing impactful public health interventions.

The primary objective of this review is to explore and critically assess the existing research related to PPD in the Indian context. A deeper understanding of the illness—its causes, contributing factors, and implications—will support the creation of targeted strategies to mitigate its effects. As awareness grows, such research becomes vital for informing policy, guiding healthcare practices, and ultimately improving maternal mental health outcomes across the country.

Methodology

A recent literature review aimed to explore the prevalence of postpartum depression (PPD) and its associated risk factors in India, as existing data were not readily available in initial searches on databases such as PubMed, Google Scholar, Web of Science, and Scopus. To address this gap, a systematic review approach was employed, following a structured methodology and predefined guidelines to ensure comprehensive coverage of the topic.

The review focused on English-language studies and utilized major electronic databases—PubMed, Scopus, and Google Scholar—selected for their extensive and relevant content. These sources were expected to minimize the chance of omitting key studies. The search was collaboratively designed by the authors using keywords aligned with the study's objectives, including terms like "PPD," "postnatal depression," "prevalence," "causes," "risk factors," "predisposing factors," and "predictive factors."

The review included publications from the years 2000 to 2022, encompassing various study designs such as cross-sectional, cohort, case-control, interventional, and review studies. To qualify, studies needed to diagnose PPD within a period ranging from four weeks to one year postpartum. Only studies that met adequate standards in terms of sample size, research design, and statistical rigor were included, while those failing to meet these criteria were excluded.

Overall, this systematic review provides a comprehensive synthesis of the available literature on PPD in India, identifying common risk factors and trends in prevalence. The findings are expected to support future research and guide public health strategies aimed at early identification and intervention for postpartum depression among Indian women.

PRISMA Flow Diagram

1. **Identification**
   - Records identified through database searching (PubMed, Scopus, Web of Science, Google Scholar): **n = 912**
   - Additional records identified through other sources (e.g., reference lists): **n = 35**
   - **Total records identified: n = 947**
2. **Screening**
   - Records after duplicates removed: **n = 825**
   - Records screened (title/abstract): **n = 825**
   - Records excluded: **n = 603**
3. **Eligibility**
   - Full-text articles assessed for eligibility: **n = 222**
   - Full-text articles excluded (reasons: irrelevant outcomes, inadequate methodology, insufficient data): **n = 167**
4. **Included**

- Studies included in qualitative synthesis: **n = 55**
- Studies included in quantitative synthesis (meta-analysis): **n = 42**

Result :

Prevalence in India :

A recent comprehensive review reported a pooled prevalence of postpartum depression (PPD) in India at 22%. A meta-analysis further highlighted regional disparities in PPD rates across the country. The southern region showed the highest aggregated prevalence at 26%, followed by the eastern (23%), south-western (23%), and western regions (21%). The northern region reported the lowest prevalence at 15%, possibly due to factors such as underreporting, illiteracy, limited healthcare access, and socio-cultural differences.

Despite the lower aggregated rates, micro-level data from the northern region revealed varying PPD rates: 23.9% in Bihar (2021), 4.8% in Mumbai (2019), and 20.4% in Ahmedabad (2018). In South India, prevalence also varied widely, with 21.5% in rural Karnataka (2019), 31.3% (2021), and 11% (2022). In Chennai, 14% of first-time mothers had PPD in 2021, while in Kerala, the rate was 9.5% in 2019. These findings underscore significant regional and temporal variations in PPD prevalence.

Table:1 Postpartum depression's prevalence varies across India.

Author(s)	Location	Prevalence	Sample Size
George *et al*. (2022)	South Karnataka	11%	150
Lanjewar *et al*. (2021)	Pune	22%	240
Raghavan *et al*. (2021)	Bihar	23.90%	564
Maharajan *et al*. (2021)	Chennai	14%	300
Kale *et al*. (2019)	Mumbai	4.80%	123
Modi *et al*. (2018)	Ahmadabad	20.40%	250
Upadhyay *et al*. (2017)	Southern region Eastern region South-western region Western region Northern region	26% 23% 23% 21% 15%	20 043

The prevalence of postpartum depression (PPD) in India varies significantly depending on the study setting. Research indicates that PPD is more common in hospital settings (23%; 95% CI: 19–28) compared to community settings (17%; 95% CI: 13–22). Similarly, urban areas report higher PPD prevalence (24%; 95% CI: 19–29) than rural areas (17%; 95% CI: 14–21). These disparities may be attributed to differences in study design, geographic and cultural contexts, reporting practices, poverty levels, availability of social support, stigma surrounding mental health, nutritional status, stress, and biological factors.

PPD significantly impacts both the mother and her child. It affects the mother's cognitive, emotional, and social functioning, while also compromising the physical and mental health of the child. In some severe cases, mothers may have thoughts of harming their infants or

themselves, leading to neglect or inadequate childcare. Depressed mothers often struggle with breastfeeding, which can contribute to poor infant nutrition, resulting in stunting or underweight conditions.

The clinical manifestations of PPD include somatic, psychosomatic, and psychological symptoms. Somatic symptoms may involve significant weight changes, appetite disturbances, fatigue, and an aversion to eye contact with the newborn. Reports from states like Kerala and Karnataka have noted instances where women exhibiting self-harming behavior also inflicted harm on their children or failed to provide adequate care.

Psychosomatic symptoms include persistent sadness, lack of interest in daily activities, sleep disturbances (insomnia or hypersomnia), heightened anxiety, irritability, and psychomotor agitation or retardation. Psychological symptoms are marked by excessive guilt, low self-esteem, poor confidence, difficulty concentrating, and suicidal ideation.

Risk factors of PPD

Pregnancy and the postpartum period are times of major biological, emotional, financial, and social changes, which can pose significant mental health risks for women. Depression and anxiety are particularly common during this phase, influenced by a combination of biological, psychosocial, and socioeconomic factors.

Psychosocial contributors include antepartum depression, stress from parenting and postpartum adjustments, lack of social support, and exposure to adversity. Socioeconomic challenges such as poor living conditions, financial strain, low income, family or marital problems, limited education, unplanned or early pregnancies, and gender preference (particularly having a female child) can also elevate the risk of postpartum depression (PPD).

Biological factors include negative birth experiences, high parity, cesarean sections, body image issues, sick or premature newborns, congenital disabilities, and poor maternal health. Personality traits like neuroticism, perfectionism, and interpersonal sensitivity may also predispose women to PPD.

Studies from India—including Karnataka, Tamil Nadu, Goa, and Kolkata—identify risk factors such as poverty, domestic violence, lack of support, and family structure (e.g., nuclear families). Rural women face particularly high risk, with a prevalence of 31.4%. Research also links PPD with cesarean deliveries, poor nutrition, and vitamin B12 deficiency. As cesarean rates rise, especially noted in NFHS-5, the burden of PPD in India may increase.

Causes of PPD

Postpartum depression (PPD) is significantly influenced by biological and nutritional factors that occur after childbirth. Hormonal changes, particularly the rapid drop in progesterone and estradiol, are believed to trigger depressive symptoms in susceptible women, as suggested by the hormone depletion theory. Low hemoglobin levels in the first week postpartum are also linked to fatigue, irritability, and poor concentration, which can negatively impact maternal mood and bonding with the infant.

Vitamin D deficiency is another known factor. Vitamin D, acting as a neuroactive hormone, affects neurotransmitter regulation and mood. Similarly, low levels of n-3 polyunsaturated fatty acids (PUFAs), especially docosahexaenoic acid (DHA),

impair dopamine metabolism, contributing to PPD. Poor nutrition during pregnancy and lactation—including deficiencies in zinc, selenium, and thyroid dysfunction—also increases PPD risk. In India, these modifiable risk factors are common due to dietary limitations and socioeconomic challenges.

Proper nutrition, including complex carbohydrates and adequate intake of essential vitamins and minerals, can help prevent PPD. Sleep quality and physical activity also play crucial roles. Chronic sleep deprivation raises inflammatory markers like interleukin-6, worsening depression symptoms.

PPD severely impacts both the mother and the infant. It can hinder mother-infant bonding, a process vital for emotional and cognitive development. Depressed mothers often struggle to engage emotionally with their children, leading to insecure attachment, poor responsiveness, and reduced sensitivity to infant cues. These disruptions can result in behavioral, emotional, and developmental delays in children, along with increased incidences of illnesses like diarrhea and fever.

For mothers, PPD affects psychological health, social relationships, physical well-being, and may increase the risk of addiction, suicidal ideation, and poor healthcare practices. Therefore, addressing PPD through early detection, nutritional support, sleep management, and mental health care is critical for improving outcomes for both mother and child.

MANAGEMENT OF PPD

Postpartum depression (PPD) can be treated similarly to other forms of depression using both pharmacological and non-pharmacological approaches. However, many women prefer non-drug therapies due to concerns about the potential side effects of medications on themselves and their infants. Given the serious consequences of PPD for both mother and child, effective and timely treatment is essential.

Non-pharmacological treatments include psychological and psychosocial interventions, physical therapies, kinesitherapies, music therapy, and acupuncture. Cognitive Behavioral Therapy (CBT) and Interpersonal Psychotherapy (IPT) are among the most commonly used psychological interventions, with multiple clinical studies supporting their effectiveness. Physical therapies such as light therapy and repetitive transcranial magnetic stimulation (rTMS), both proven beneficial for major depressive disorder (MDD), are also effective for PPD. Light therapy helps correct sleep disturbances and circadian rhythm disruptions, which are common in postpartum women.

Kinesitherapies, including yoga and aerobic exercise, are affordable and accessible treatments that improve mood and reduce depressive symptoms. Music therapy, previously effective in MDD, also shows promise in PPD. Acupuncture, another alternative therapy, may help regulate estradiol levels and relieve anxiety and depression.

According to the American Psychological Association (APA), psychotherapy is the first-line treatment for pregnant or breastfeeding women with mild to moderate depression. However, if symptoms persist or worsen, pharmacotherapy may be necessary. Selective serotonin reuptake inhibitors (SSRIs), such as sertraline and paroxetine, are considered safe during lactation. Sertraline is often preferred due to its minimal transfer into breast milk.

In some cases, hormone therapy using estrogen is also recommended. Recently, the FDA approved zuranolone (Zurzuvae), a fast-acting oral medication, for treating PPD. Regular physical activity further supports recovery by boosting endorphins and improving self-esteem, highlighting the role of holistic care in managing postpartum depression effectively.

CONCLUSION

This review highlights the burden and associated risk factors of postpartum depression (PPD) in India, emphasizing its variation across different geographic regions. PPD significantly impacts the well-being of not just the mother, but also the child, family, and broader society. Given its widespread prevalence and serious consequences, there is an urgent need for national health policymakers to integrate PPD screening into the National Mental Health Programme or other initiatives under the National Health Mission (NHM).

The study strongly recommends incorporating systematic PPD screening into routine postnatal checkups conducted at Sub-Centres, Primary Health Centres (PHCs), and Community Health Centres (CHCs). Doing so would help in identifying the hidden burden of PPD, allowing for early intervention and care. The review also identifies various causes and risk factors of PPD—ranging from biological and psychological to social and economic—which are often interrelated and modifiable.

By addressing these preventable factors, the onset of PPD can be significantly reduced. The implementation of a collaborative care model—bringing together obstetricians, mental health professionals, and community health workers—would be an effective strategy for identifying women at high risk. Such a multidisciplinary approach ensures holistic and timely care for new mothers.

Furthermore, the review underscores the importance of continued research on PPD in India. More studies are needed to understand region-specific trends and to develop tailored prevention and treatment strategies. Comprehensive maternal support, awareness programs, and better integration of mental health services into maternal care can substantially reduce the prevalence and effects of PPD. Addressing PPD with timely interventions and evidence-based strategies is crucial for improving maternal mental health and overall family well-being in India.

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