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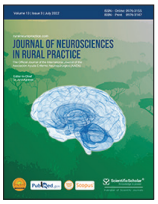

Review Article

Prevalence and associated risk factors of postpartum depression in India: A comprehensive review

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ABSTRACT

Postpartum depression (PPD) is a psychological illness that affects women following delivery. According to the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR), PPD is a serious form of depression that begins four weeks following birth and continues for one year. Pregnancy and the period after delivery can be hazardous for women. Mothers undergo significant biological, emotional, financial, and societal changes during this time. Some women are predisposed to mental health disorders such as melancholy and worry. Many postpartum women do not acknowledge the seriousness of their condition, and many depressed mothers go untreated. Untreated PPD is harmful to both the mother and the newborn. The exact cause of PPD is unclear; however, hormonal fluctuations during pregnancy and childbirth, genetic susceptibility, birth trauma as well as psychosocial and demographic factors may serve as potential risk factors. The objective of this study is to determine the prevalence and risk factors of PPD in India. The review evaluates English language literature on PPD using Scopus, PubMed, and Google Scholar databases searched electronically between 2000 and 2022. The keywords "postpartum depression," or "postnatal depression," and "prevalence," and "causes," and "risk factors," or "predisposing factors," or "predictive factors" were used to search the database. The prevalence of PPD varies in different geographical regions and study settings. In India, the overall prevalence of PPD is 22%. However, the greatest prevalence was in the southern regions (26%; 95% confidence interval [CI]: 19–32) and the lowest in the northern regions (15%; 95% CI: 10–21). This study outlines the burden of PPD in India. Comprehensive intervention programs should be implemented to address the disease at a national level. The national authorities should incorporate PPD screening in the National Mental Health Program and emphasize health promotion activities.

Keywords: Postpartum depression, Prevalence, India, Risk factors

INTRODUCTION

In India, postpartum depression (PPD) is one of the most underdiagnosed and untreated disabilities.[1] The World Health Organization (WHO) has characterized it as "a special state of mental health disorder and a variant of depression."[2] It directly affects two vulnerable sets of the population, namely, postpartum mothers and their infants. Many depressive mothers go untreated, and many postpartum women ignore, deny or reject the severity of their disease. It significantly reduces women's pleasure and impacts the mother-infant attachment, the child's development, and overall family relations.[3] Untreated PPD harms both the mother and the child's health, and it can even lead to suicide and infanticide. Some studies show that PPD is one of the reasons for the increase in infant mortality rate.[4]

According to the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV–TR), PPD is a major depressive disorder (MDD) with postpartum onset, and depressive symptoms begin within four weeks postpartum to one year of life. It was empirically corroborated in some studies.[5] The exact reason for PPD is unknown. The potential risk factors for PPD are hormonal variation in pregnancy, childbirth, genetic predisposition, birth trauma, and psychosocial and demographic characteristics.[5] Studies show that PPD is due to many factors, which include psychosocial, socioeconomic, and biological factors. The other modifiable risk factors of PPD are deficiency of trace elements (selenium and zinc), vitamin D, and anemia, which significantly impact PPD.[5] Hence, the study seeks to determine the burden and risk factors associated with PPD in India.

Study novelty

The included paper has undergone thorough verification including an assessment of adherence to established guidelines. The systematic review methodology has been employed to synthesize information regarding the burden of PPD. Utilizing text and descriptive results extraction

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techniques, a comprehensive survey of previously conducted research has been undertaken. It is noteworthy that there is a scarcity of existing literature addressing the burden and risk elements related to PPD in India. To address this gap and contribute to the mitigation of this concealed public health issue, it is essential to gain an in-depth understanding of the severity of this condition. Such knowledge is vital for the formulation of effective intervention strategies. Thus, the principal objective of this review is to systematically analyze and interpret the extant body of literature concerning the burden and risk factors related to PPD in the Indian context.

MATERIALS AND METHODS

An initial search using PubMed, Google Scholar, Web of Science, and Scopus did not turn up any reviews related to the burden of PPD and its risk factors in India recently. The scope of the evidence in this domain in India has been evaluated using the systematic review approach. This analysis followed a predefined framework and set of rules. This review evaluates English language literature on PPD using electronic information databases including Google Scholar, Scopus, and PubMed, which were used to conduct systematic searches. These search libraries were selected because they would probably concentrate on delivering complete and appropriate coverage of the topic while minimizing the likelihood of missing any articles. The authors collaborated to determine the search terms, which were derived from keywords related to the study objective. The chosen papers for this evaluation have been published in the years 2000 through 2022. The following keywords (search strings/MESH terms) were used in each database: The following keywords relate to this article: "PPD" or "postnatal depression" and "prevalence" and "causes" and "risk factors" or "predisposing factors" or "predictive factors" were used to search the database. The study included cross-sectional, cohort, case–control, interventional, and review articles that studied the prevalence, risk factors, and predisposing factors of PPD. Furthermore, the timeframe for diagnosing PPD in these articles was four weeks from giving birth to one year following delivery. The analysis did not include the papers that needed to follow adequate guidelines for sample size, research design, and statistical techniques.

RESULTS AND DISCUSSION

Prevalence of PPD in India

A recent systematic review shows that the pooled prevalence of PPD in India is 22%.[6] One meta-analysis shows the macrolevel burden of PPD in various parts of India. The southern area of India had the highest estimated total aggregated prevalence (26%; 95% confidence interval [CI]: 19–32), followed by Eastern region (23%; 95% CI: 12–35), South-western area (23%; 95% CI: 19–27), and Western region (21%; 95% CI: 15–28). The Northern area of India possesses the lowest estimated total aggregated occurrence (15%; 95% CI: 10–21).[7] It may be due to underreporting, lack of awareness, illiteracy, lack of health-care facilities, and differences in sociocultural context. The microlevel prevalence of PPD can vary in the northern and southern regions. In the northern region, the incidence of PPD in Bihar in 2021 was (23.9%);[8] in Mumbai in 2019 was 4.8%,[9] and in Ahmadabad in 2018 was 20.4%.[1] In South India, the burden of PPD in rural south Karnataka was 11% in 2022,[10] 31.3% in 2021,[11] and 21.5% in 2019.[12] The prevalence of PPD in Chennai in 2021 was 14%,[13] and in 2019, 9.5% of primary mothers in Kerala had PPD [Table 1].[14]

The prevalence of PPD varies depending on the study settings. The prevalence of PPD was reported higher in hospital settings (23%; 95% CI: 19-28) compared to community settings (17%; 95% CI: 13-22). Similarly it was higher in urban settings (24%; 95% CI: 19-29) compared to rural settings (17%; 95% CI: 14-21).[7] The burden of PPD varies in different studies. It may be due to variations in study designs, geographical areas, cultural backgrounds, reporting practices, divergent views on stigma, poverty, social services, inadequate nutrition, stress levels, and biological factors.[15]

The PPD has an impact on the cognitive, emotional, and social development of the mother. Furthermore, maternal depression has an impact on the physical and psychological health of the children.[8] Depressed mothers are unable to care for their newborn babies, and some mothers have thoughts of hurting their infants, which may lead to poor childcare.[16] Some studies show that depressive mothers are not interested in breastfeeding their babies properly, which will lead to underweight and stunting babies.[17] The clinical symptoms of PPD include somatic, psychosomatic, and psychic symptoms. The somatic symptoms of PPD are significant weight loss or

Table 1: Burden of postpartum depression in different parts of 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	26%	20 043
	Eastern region	23%	
	South-western region	23%	
	Western region	21%	
	Northern region	15%	

weight gain, variation in appetite, fatigue, and inability to look at the newborn baby. Some mothers have symptoms of self harming as well as harming their children, which were reported in Kerala and Karnataka,[18,19] and improper caring of children.[16,20] The psychosomatic symptoms are sadness, less interest in all activities, insomnia or hypersomnia, anxiety, irritability, psychomotor agitation or retardation. The psychic symptoms of PPD are excessive guilt, lowered self-esteem, self-confidence, difficulties concentrating, and suicide thought.[20]

Risk factors of PPD

Pregnancy and the postpartum period can be hazardous for women. Mothers typically undergo enormous biological, emotional, financial, and societal transformations during this period.[21] Some women are predisposed to having mental health issues including sadness and anxiety.[22] Depression in mothers is due to many factors, which include psychosocial, socioeconomic, and biological factors.[5] The psychosocial factors include a history of psychiatric illness, antepartum depression, stress (as a result of life events from parental care and all occurrences in the postpartum period), lack of social support, and adversity.[7,23] The socioeconomic factors include poverty, poor living circumstances, financial concerns, low income, marital conflict, family conflicts, more children to care for, fewer job prospects, having a female child, a lack of maternal education, unwanted gender, and early age of pregnant mothers.[1] The biological factors include bad obstetric histories, unplanned pregnancy, pregnancy complications, complications during delivery, an unsatisfactory delivery experience, high parity, a C-section birth, problems with body image, child care, a sick newborn, premature birth (<34 weeks gestation), and having a child with a congenital disability.[20,24] Other risk elements of PPD are poor physical health of mothers, adverse life events, cultural practices, and poor environmental conditions.[25] Some studies show that personality traits such as dependency, neuroticism, obsessionality, perfectionism, and interpersonal sensitivity are risk factors for PPD.[26]

Some of the studies from India (Karnataka);[27] (Tamil Nadu);[28] (South India);[29] (Goa)[30] reported that financial hardship, marital violence, lack of social support, delivery of a female child, and the protective effect of traditional rituals have been identified as PPD risk factors. A study from Karnataka[27] showed that type of family, women's and husbands' occupations, and poverty are independent indicators for PPD. It is a high risk (31.4%) among rural mothers after delivery.[27] A study from Kolkata discovered that PPD is strongly linked to family structure. It is higher in women, who belong to the nuclear family.[31] According to research from South India, women who underwent a cesarean section, those women who had an unexpected pregnancy, failed to consume enough food during the postpartum period or women who are inadequate in vitamin B12 are more prone to suffer from PPD.[29] According to a study conducted in Pune, PPD is more likely in women, who had cesarean births and mothers, who were under the age of 25.[32] The National Family Health Survey (NFHS)-5[33] shows that C-section delivery trends are increasing in India compared with NFHS-4. It may substantially increase the prevalence of PPD.

Causes of PPD

Reproductive hormones have been altered significantly after delivery. It may raise women's risk of PPD.[5] According to the hormone depletion theory, deficits in estradiol and progesterone in susceptible women can rapidly lead to postpartum blues and depression.[5] There is a link between low hemoglobin levels during the first week after childbirth and PPD. It has been observed that it aggravates symptoms including tiredness, irritability, and a lack of focus, which can influence a new mother's mood, menstruation, and behavior with her children.[5] Numerous studies have found that vitamin D receptors in the human brain as well as vitamin D deficiency regulate neurotransmitters in depressed symptoms.[5] Vitamin D in food acts as a neuroactive hormone to prevent depression. Low levels of n-3 polyunsaturated fatty acid (n-3 PUFA) significantly impact PPD. The metabolism of dopamine is affected by n-3 PUFA depletion. It could be a cause of PPD. It is also prevalent in pregnant women with metabolic disorders.[5]

Some studies show that increased levels of docosahexaenoic acid and seafood consumption may reduce the risk of PPD.[4] Depression is connected to the deficiency of trace elements such as selenium and zinc and thyroid dysfunction.[5] Pregnancy and breastfeeding reduce nutrients necessary for the neurotransmission system.[5] As a developing country, these modifiable risk factors of PPD are common in India.[20,34] Women's mental health is affected by their physical health, which is kept in check by a good diet. A well-balanced diet is essential for a woman's healthy mental health. It is influenced by the quality of one's food, proper dietary intake, and nutritional condition. Consuming complex carbohydrates reduces depression.[35] Healthy eating status has a significant effect on the mother's mental health.[5] Some studies show that sleep quality is one of the determining factors for PPD. Acute sleep deprivation inhibits the immune system producing inflammatory markers such as interleukin-6 and tumor necrosis factors, which are more prominent among postpartum depressive women. Chronic sleep deprivation hurts mental health as well as the overall happiness of life.[36] Exercise and physical activity in the third trimester of the antepartum period in addition to sleep and dietary quality greatly reduce PPD.[4]

Depression after childbirth can harm the health of both the infant and the mother. There are nine consequences for infants related to PPD. They are variations in anthropometric (length, weight); motor, cognitive, language, emotional, social, and behavioral developments; breastfeeding; bonding; and attachment (mother-to-infant and infant-to-mother bonding).[37] Mother-infant bonding is the development of emotions and feelings of guarding toward the child, which normally starts in the first trimester of pregnancy and intensifies with fetal movement postpartum. "Bonding" refers to a mother's one-way emotional connection with her child leading to the infant's future attachment. The impaired bonding can have long-term repercussions on the child's emotional, cognitive, and behavioral development and potentially increase the risk of adult psychopathology.[38] Studies suggest that PPD can affect the mother-infant relationship.[39] Depressed mothers often face challenges in bonding with their children during the first year compared to non-depressed women. The PPD correlates with reduced emotional involvement with newborns.[37] These mothers exhibit an insecure attachment and perceive a negative relationship with their infants. Chronic maternal depression is linked to a higher likelihood of having attachment insecurity.[37] In addition, depressed mothers often struggle with adapting to motherhood displaying decreased sensitivity to their infants' cues leading to suboptimal attachment.[40] Furthermore, infants born to persistently depressed mothers were more prone to unreliable attachment. Mothers with PPD had lower levels of positive emotional engagement and communication.[37] Infants living with depressed mothers had considerably more diarrheal episodes and febrile illnesses per year than non-depressed mothers.[41,42]

Maternal PPD was associated with increased maternal mortality and morbidity risk. The PPD affects mothers in five different ways; they are, physical health (healthcare practices and utilization measures), psychological health (anxiety and depression), quality of life, relationships (social relationship and relationship with partner and sexuality), risky behaviors (addictive behavior and alcohol consumption), and suicidal ideation.[37]

Treatment of PPD

The PPD can be treated in the same way as other types of depression. The PPD has been treated with both medication and non-pharmacological therapies. However, due to concerns about the side effects of pharmacological therapy on the mother and the child, the majority of women with PPD select non-pharmacological treatment as their first line of mitigation.[43] Given the catastrophic effects of PPD on the mother as well as the child along with the high prevalence of disease, appropriate care for PPD is important. Psychological/psychosocial intervention, physical therapy, kinesitherapy, music therapy, and acupuncture all serve as non-drug treatments for PPD.[44] Cognitive behavioral therapy (CBT) and interpersonal psychotherapy (IPT) stand as prominent psychological and psychosocial interventions frequently employed in addressing PPD. Extensive clinical evidence underscores the substantial effectiveness of both approaches.[45,46] Physical therapies such as repetitive transcranial magnetic stimulation (rTMS) and light therapy have also been shown to be useful for PPD. The symptoms PPD can be improved by rTMS, which was widely used in Major Depressive Disorder (MDD).[47] The light therapy is another excellent physical treatment option for treating disrupted sleep and circadian rhythms (two major risk factors connected with the development of PPD).[48] Kinesitherapies such as aerobic exercise and yoga are considered low-cost, readily available therapy for PPD.[49,50] Music therapy, previously shown to be effective for patients dealing with MDD, has also exhibited therapeutic benefits for PPD.[51] Furthermore, Acupuncture, a commonly used complementary medicine, may help ease depressive and anxious symptoms in women with PPD and influence estradiol levels.[52]

When depression or anxiety is moderate, the American Psychological Association (APA) recommends psychotherapy without a prescription as a first-line treatment for pregnant or nursing women with MDD. However, non-pharmacological interventions are insufficient or when the condition requires additional support, pharmacotherapy involving medications like antidepressants (selective serotonin reuptake inhibitors [SSRIs]) are prescribed as a first-line treatment for PPD. Paroxetine and sertraline, frequently utilized SSRIs, are considered safe for breastfeeding. Sertraline is primarily suggested as the initial therapy in cases of new-onset PPD due to its minimal excretion in breast milk.[5] In addition to antidepressant therapy, hormone therapy (estrogen therapy) is also recommended for treating PPD.[2] Recently, U.S Food and Drug Administration (FDA) discovered and approved a new rapid short-acting drug (Zurzuvae/zuranolone) to reduce the risk of PPD.[53] Depressive symptoms are reduced by physical activity and exercise. Exercise helps to reduce poor self-esteem induced by depression. Exercise produces endogenous endorphins and opioids, which improve mental wellness.[4]

CONCLUSION

This review identifies the burden and related risk elements of post-partum depression in India. The rate of incidence of PPD varies with geographic locations in India. Given the detrimental impact of PPD on the health of the mother, child, family, and society; the national policymakers must incorporate PPD screening in the National Mental Health Programme or in any other NHM activities. This study

recommends for the systematic screening of PPD during the routine postnatal checkups in Sub-Centre, Primary Health Centre, as well as Community Health Centre settings to reduce the hidden burden of disease. This review also outlined the causes and the associated risk elements of PPD. These elements are most likely interconnected and play a role in the development of PPD. The PPD can be avoiding by addressing these largely modifiable risk factors. It makes sense to identify mothers at high risk for developing PPD using a collaborative care approach (for instance, collaboration between a mental health professional and an obstetrician). It precisely the need for comprehensive cares and support to mitigate the risk of PPD and its repercussions. Further research in this domain is imperative for developing effective prevention and intervention strategies to address the emerging challenges of PPD in the country.

Ethical approval

The Institutional Review Board's approval is not required.

Declaration of patient consent

Patient's consent was not required as there are no patients in this study.

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Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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