International Journal of Multidisciplinary Research and Growth Evaluation.

Systemic Review: Postpartum Depression during Covid-19 Pandemic

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Article Info
ISSN (online): 2582-7138
Volume: 06
Issue: 02
March-April 2025
Received: 24-02-2025
Accepted: 21-03-2025
Page No: 1492-1497

Abstract
The 2019 coronavirus disease (COVID-19) is an international public health emergency. There have only been a few research that have looked into the influence of the COVID-19 epidemic on female mental health. Prior study has indicated that the frequency of mental illnesses among postpartum mothers is much higher following catastrophes or crises. The impact of the coronavirus disease 2019 (COVID-19) pandemic on prevalence of Postpartum Depression (PPD) and associated risk factors for postpartum women, on the other hand, remained unknown. Therefore, the present systematic review and meta-analysis aimed to determine the impact of the COVID-19 pandemic on the PPD and to summarize risk factors of PPD during the COVID-19 pandemic. In accordance with PRISMA guidelines, a literature review was carried out by retrieving articles from the Scopus database. This systematic review covered a total of 22 papers. A variety of therapy options have also been suggested.

DOI: https://doi.org/10.54660/.IJMRGE.2025.6.2.1492-1497

Keywords: Postpartum, depression, covid-19, prevalence, risk factors and treatment.

1. Introduction

Coronavirus disease (COVID-19) is a highly contagious disease that has created a global health hazard. COVID-19 infection has spread swiftly across China and other nations across the world since it first appeared in Wuhan, China, in December 2019. The COVID-19 outbreak was declared a public health emergency of worldwide concern by the World Health Organization (WHO) on January 30th, 2020 (Liang *et al*., 2020) [18].

Fear about COVID-19, as well as the economic downturn, social distancing, and isolation, have all had a significant influence on people's mental health and well-being. Women during pregnancy, birth, and the postpartum period are one of the most susceptible populations affected by the pandemic. Both familial and hormonal changes have a significant impact on women's mental health after birth, which can exacerbate existing psychopathologies or lead to the development of a particular psychopathology like postpartum depression (PPD) (Gluska *et al*., 2022) [12]

The COVID-19 pandemic has had an impact on women's lives, especially during the antenatal, intranatal, and postnatal periods (Gupta *et al*., 2021) [14]. Transitioning to motherhood is a difficult time for women, and it has been identified as a window of increased vulnerability for the development of mental illness (Yim *et al*., 2015) [40]. Women are more susceptible to clinical depression during the postpartum period, which is marked by sad mood, agitation, disappointment, and sleep disturbances (Abdollahi & Zarghami 2018) [1].

Low mood, loss of enjoyment, decreased energy and activity, marked functional impairment, low self-esteem, and thoughts or actions of self-harm or suicide are all signs of postpartum depression (PPD) (Turkcapar *et al*., 2015).

According to studies, 9 to 13% of women experience depression symptoms throughout pregnancy and the postpartum period. In India, the prevalence of postpartum depression (PPD) range between 15 to 20% (Puri *et al*., 2021) [27]. A recently report by the World Health Organization (WHO) highlights that approximately 22% of Indian mothers experience PPD, emphasizing the need for enhanced resources and capacity building in maternal health care (Bara, 2018) [3].

The effects of the COVID-19 pandemic on mental health, such as sadness and low self-esteem, have also been recorded (Wang *et al*., 2020) [36]. Sleep disturbances, mood swings, changes in appetite, fear of damage, significant concerns about the baby, a greatdeal of grief and sobbing, a sense of doubt, difficulty concentrating, lack of interest in daily activities, and thoughts of death and suicide are all symptoms of the sickness (Aswathi *et al*., 2015). In severe cases of disease, feelings of hopelessness can put one's life in jeopardy and lead to suicide.

PPD is defined by a new mother's persistent low mood, often accompanied by feelings of despair, worthlessness, and/or hopelessness. It has long been recognised as a period of elevated risk for the onset of major mood disorders. The blues (baby blues, maternity blues), postpartum (or postnatal) depression, and puerperal (postpartum or postnatal) psychosis are the three most prevalent kinds of postpartum affective disease, each with its own prevalence, clinical presentation, and management. The "baby blues" are a brief period of emotional disturbance (dysphoria, tearfulness, mood lability, difficulties sleeping, impatience, and anxiety) experienced by up to 4 in 5 women in the first few days after childbirth that usually lasts for 10 days. The "baby blues" differ from postpartum depression (O'hara & MacCabe., 2013) [24].

2. Materials and methods

2.1 Eligibility criteria and search strategy

This review is about the risk factors and prevalence of postpartum depression among mothers during COVID-19 pandemic. We assumed that the prevalence rate of postpartum depression during the COVID-19 pandemic outbreak was higher than usual because COVID-19 pandemic has impacted the mental health with fear. The eligible studies included were observational, retrospective, case-control, case-report, cross-sectional, cohort, hypothesis and meta-analysis research that reported the rate of depression in pandemic. In addition to these studies, narrative review, letter and viewpoint that give knowledge about the risk factors of postpartum depression and its complications in future with the prevention and treatment included.

The research data included articles till 23rd March 2022 in the Scopus database. The keywords used in the search strategy included – Postpartum, depression, covid-19, prevalence, risk factors and treatment. Figure 1 illustrates the systematic search method. Relevant articles were chosen following the screening of titles and abstracts. The full texts of all relevant articles were thoroughly read and results analysed independently by one reviewer.

2.2 Collection of data and its validation

The selected keywords were used to find appropriate articles and the available research in the database was included. For inclusion criterion, the articles were selected based on key indicators such as clinical features, health implications, and prevalence. Manuscripts that did not meet the inclusion criteria were removed and full texts of eligible articles were exported. The selected manuscripts were studied thoroughly and their findings were analyzed. In case of any controversies in any of the research papers, the same were discussed and discarded if required.

2.3 Data extraction and analysis

Data from the Scopus database was retrieved using specific keywords and exported into an Excel file for analysis. During this phase of the study, the articles selected were screened that were relevant to Postpartum Depression and irrelevant were discarded. Both reviewers studied titles and abstracts from the data and excluded studies that were not relevant to the present study, by thorough discussion. The eligible articles were studied after retrieving its full text by both the reviewers. The selected articles were independently assessed by the reviewers, who recorded pertinent information from each study.

2.3.1 A study was included if:

- It was related to COVID-19
- The study sample consisted of women with healthy babies in the postpartum period
- The prevalence of PPD, and its contributing factors with PPD were reported.

2.3.2. Studies were excluded if:

Pregnant women's clinical outcomes were the only information reported

- Insufficient information was provided to calculate the prevalence and standard error of postpartum depressive symptoms
- The screening tools for depressive symptoms was not validated
- PPD was measured other than the Edinburgh postnatal depression scale (EPDS) with a cut-off score of 13 (defined as major depression symptoms) in order to maximize data uniformity across studies.

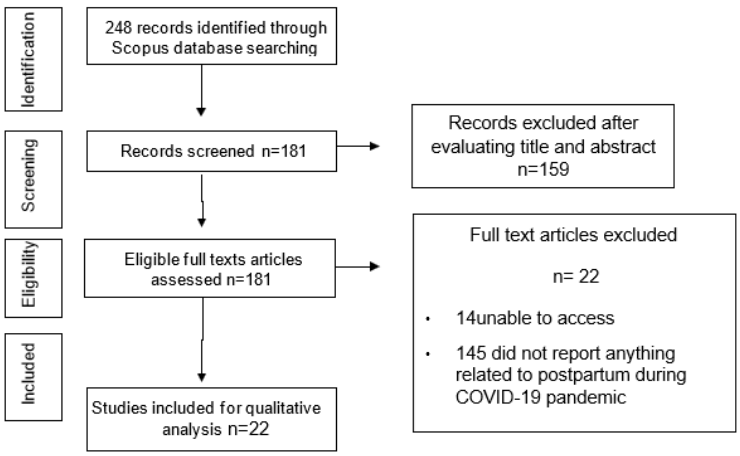

Fig 1: Prisma flow diagram for systematic analysis

3. Result and discussion

A total of 248 studies were found in scopus database. Among these studies, title and abstract was evaluated and 181 manuscripts were selected for full text review. Out of these, 159 were excluded, as 14 were inaccessible, 145 did not report vulnerability or anything else related to association of metabolic syndrome or its components with COVID-19. Finally, 22 manuscripts were included in this review. PRISMA guidelines for systematic review were used (Figure 1).

4. Description of study

There were 22 manuscripts selected after screening, published online till 23rd March 2022 in scopus database. The purpose of each study has been detailed in Table I.

Table 1: Description of Included Articles (n=22)

Purpose of the study	Study Design
Association between breastfeeding attitudes and postpartum depression among mothers with premature infants during COVID-19 pandemic	Cross-sectional & Observational
Association of Postpartum Pain Sensitivity and Postpartum Depression: A Prospective Observational Study	Prospective observational clinical study
Behavioral coping phenotypes and associated psychosocial outcomes of pregnant and postpartum women during the COVID-19 pandemic	Cross-sectional
Depressive symptoms and psychological distress from antenatal to postnatal period in women with high-risk pregnancy: A prospective study during the COVID-19 pandemic	Prospective & Cross-sectional
Effects of the COVID-19 pandemic on anxiety and depressive symptoms in pregnant women: a preliminary study	Cross-sectional
Effect of postpartum depression on women's mental and physical health four years after childbirth	Cohort
Impact of COVID-19 pandemic on postpartum depression among mothers of extreme and early preterm infants	Cross-sectional & Comparative
Incidence of Postpartum Depression in a Tertiary Care Hospital in Navi Mumbai amid COVID-19 Pandemic	Cross-sectional
Mental Health of Pregnant and Postpartum Women During the Coronavirus Disease 2019	Systematic Review & Meta-Analysis
Mobile interventions targeting common mental disorders among pregnant and postpartum women: An equity-focused systematic review	Systematic Review & Meta-Analysis
Postpartum depression in Covid-19 risk-stratified hospital zones: A cross-sectional study from India	cross-sectional
Postpartum Depressive Symptoms and Experiences during COVID-19	Convergent mixed-methods & Cross-sectional
Postpartum mental illness during the COVID-19 pandemic: A population-based, repeated cross-sectional study	Cross-sectional
Prevalence and risk factors associated with postpartum depression during the covid-19 pandemic- A Literature Review and Meta-Analysis	Literature Review and Meta-Analysis
Prevalence and risk factors of postpartum depression in the Middle East: a systematic review and meta–analysis	Systematic Review & Meta-Analysis
Psychological impacts of the COVID-19 pandemic on one-month postpartum mothers in a metropolitan area of Japan.	Cohort
Risk Factors for Postpartum Depression During COVID-19 Pandemic: A Systematic Literature Review	Systematic Review
The association between birth satisfaction and the risk of postpartum depression	Cross-sectional
The COVID-19 outbreak increases maternal stress during pregnancy, but not the risk for postpartum depression	Cohort
The Effect of COVID-19 Pandemic and Social Restrictions on Depression Rates and Maternal Attachment in Immediate Postpartum Women: a Preliminary Study	Cross-sectional
Triggering of postpartum depression and insomnia with cognitive impairment in Argentinian women during the pandemic COVID-19 social isolation in relation to reproductive and health factors	Cross-sectional
Trust and well-being of postpartum women during the COVID-19 crisis: Depression and fear of COVID-19	Cross-sectional

4.1 Impact of COVID-19 on depression symptoms

A cross-sectional study investigated how the COVID-19 pandemic and related isolation measures affected the risk of postpartum depression (PPD) following preterm birth. The findings revealed a notably higher prevalence of depressive symptoms among women in the COVID-19 group compared to the pre-pandemic group (26% vs. 12%, P = 0.043). Additionally, a multivariable logistic regression analysis confirmed a significant link between the pandemic and an increased risk of PPD (Vatcheva *et al*., 2021) [34].

4.2 Risk Factors for PPD during the COVID-19 Pandemic

The factors linked to postpartum depression can be categorised into five domains: psychiatric risk factors, obstetric risk factors, biological and hormonal risk factors, social risk factors, and lifestyle risk factors.

4.2.1 Psychological factors

In Japan, several reports have explored how the COVID-19 pandemic affected postpartum depression. One such study analyzed postpartum mental health status before and during the pandemic using a continuous database from a metropolitan region. In result the anxiety factors were significantly higher and the items related to anhedonia and depression factors were significantly lower in the During COVID-19 group (Takubo *et al*., 2021) [30].

A prior history of depression and anxiety is one of the key factors associated with a heightened risk of developing

postpartum depression. The presence of mental health issues during pregnancy, including as depression, is a strong predictor of postpartum depression. Having negative feelings about the recent pregnancy, experiencing numerous significant life events, and having a history of sexual abuse have also been identified as risk factors for postpartum depression (Ghaedrahmati *et al*., 2017) [11].

4.2.2 Obstetric risk factors

Postpartum depression is more common in multiparous women than in nulliparous women, according to studies, but nulliparous women had a higher frequency of the disorder, according to another study (Mayberry *et al*., 2007) [21]. Some studies have found that having two or more children may be linked to a higher risk of developing depression due to the added psychological strain. However, the differences in study results indicate that the number of children alone is not an independent predictor of postpartum depression. Instead, it is the psychosocial circumstances created by having multiple births that contribute to the development of the condition (Mathisen *et al*., 2013) [19].

4.2.3 Biological & hormonal factors

The substantial declines in various steroid hormones, including estrogen, progesterone, and cortisol, that accompany childbirth are one of the most conspicuous physiologic aspects. Hormone withdrawal theories claim that low levels of estrogen and progesterone are to blame for certain women's postpartum depression. Despite the fact that all women experience major changes in hormone levels after birth, only a tiny percentage of women suffer PPD. (O'hara & McCabe, 2013) [24].

Blood levels of serotonin and tryptophan are also proven to help with depression. A study found a link between mood disorders and depression and distinct serotonin transporter gene alleles and serotonin receptors. Serotonin is a type of monoamine neurotransmitter that is synthesized from the amino acid tryptophan through a series of enzymatic reactions. The amount of serotonin produced is directly proportional to the individual's diet. Protein-rich diets lower levels of tryptophan and serotonin in the brain, but carbohydrate snacks have the opposite effect. Reduced brain tryptophan by up to 15% leads to an increased depression scale rate of postpartum depression in dietary inadequacies (Ghaedrahmati *et al*., 2017) [11].

4.2.4 Social factors

A study was conducted to investigate the relationship between various social and clinical factors—especially those specific to Chinese culture—and the presence of significant postpartum depression (PPD) symptoms. After performing multiple logistic regression analysis, strong associations were found between significant PPD symptoms and factors such as in-laws' preference for a male baby over a female, dissatisfaction with spousal support, undergoing a cesarean section, and using mixed feeding methods (Li *et al*., 2020) [17].

A decrease in social support is considered the most significant environmental factor contributing to the development of depression and anxiety disorders. During pregnancy, husband sexual assault and other forms of domestic violence are recognised as contributing factors to the occurrence of postpartum depression. Social factors such as a woman's bond with her family and community, as well as prenatal behaviours such as smoking, have been linked to a 1.7-fold increase in the risk of postpartum depression (Ghaedrahmati *et al*., 2017) [11].

4.2.5 Lifestyle

Dietary habits, sleep quality, physical exercise, and overall activity levels are lifestyle factors that can influence the risk of postpartum depression. Consumption of vegetables, fruits, legumes, seafood, milk and dairy products, olive oil, and a variety of nutritious foods has been shown to prevent postpartum depression by up to 50%. As a cofactor, vitamin B6 is useful in the creation of serotonin from tryptophan. As a result, a decrease in this vitamin may have a role in the development of postpartum depression. A study found a positive correlation between vitamin B2 intake at the 21st week of pregnancy and the occurrence of postpartum depression. There is numerous research that suggest the association is bidirectional, implying that while postpartum depression may reduce breastfeeding rates, not breastfeeding may raise the risk of postpartum depression. Furthermore, there is some evidence that breastfeeding can help prevent postpartum depression or hasten the recovery process (Pope & Mazmanian, 2016) [26].

4.3 Treatment

4.3.1 Psychological treatments

Due to concerns about infant exposure to medicine through breast milk or potential adverse effects, many moms with postpartum depression chose psychological therapy rather than antidepressants.

4.3.2 Interpersonal Therapy (IPT)

Interpersonal Psychotherapy is a dynamically informed, time-limited psychotherapy that aims to reduce symptoms and improve interpersonal functioning in patients. These are divided into four categories: IPT theories, targets, tactics, and techniques. Interpersonal psychotherapy is now the most well-validated treatment for postpartum depression and should be regarded first-line therapy, particularly for depressed breastfeeding mothers (Stuart, 2012) [29].

4.3.3 Cognitive Behavioural Therapy (CBT)

The assumption of cognitive behavioural therapy (CBT), a well-studied and successful treatment for major depression, is that mood is influenced by both perceptions and behaviours. CBT lowers depressed symptoms more effectively than normal treatment alone in women with postpartum depression, with a medium effect size at the conclusion of the intervention and a residual moderate effect size six months later (Buck, 2019) [5].

4.3.4 Nondirective counselling

Psychosocial interventions, in contrast to IPT or CBT, are unstructured and no manualized, and include nondirective counselling and peer support. Nondirective counselling (sometimes called "person- cantered" counselling) is built on sympathetic, non-judgmental listening and support. The rate of recovery from PPD for counselling (69 percent) was significantly higher in this study than in the control group (38 percent) (Fitelson *et al* 2010) [10].

4.3.5 Omega-3 fatty acids

Due to the obvious established health benefits of omega-3 fatty acids for pregnant and postpartum women, as well as

some research demonstrating good effects on mood in the general population, these chemicals have garnered special attention in the treatment of perinatal depression. Omega-3 fatty acids found in fish oils, such as eicosapentaenoic acid (EPA) and docosa-hexaenoic acid (DHA), are essential for the development of a baby's central nervous system while in the womb, and maternal omega-3 fatty acid depletion occurs throughout pregnancy to aid this process. DHA concentrations, or the DHA: n-6 DPA ratio, was considerably lower in postpartum women experiencing depression symptoms in plasma or serum investigations than in those who were not (Levant, 2011) [16].

5. Conclusion

This study demonstrates that pregnant women during Covid-19 were more prone to postpartum depression. In addition, pregnant women with more lifestyle risk factors have a higher chance of postpartum depression than those with one or no risk factors. More study is needed to better understand the clinical manifestations and health implications of postpartum depression in the COVID-19 pandemic, so that new therapeutic strategies can be devised.

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