The Impact of Maternal Postpartum Depression on Child Growth/Development in India – A Literature Review

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Abstract:

Postpartum depression (PPD) can impede mother-child bonding, feeding, and caregiving to stimulate child growth. The lack of initiative can deprive children of the nurturing essential for their development. In India, where mental health is considered 'taboo,' PPD has a high prevalence rate and goes unnoticed. Therefore, this paper explores the risk factors of PPD in India, such as age, socio-economic status, education levels, marital and familial relationships, lack of mental healthcare facilities, and the child's gender. Studies that investigate these relationships were used to determine its impact on an infant's physical and psychological growth. This paper examines current information on how PPD affects children's cognitive development in India, emphasizes the importance of longitudinal studies to observe its prolonged effect, and advocates for research on mothers from diverse socioeconomic situations where healthcare access may not be a constraint.

Introduction

Postpartum depression (PPD) is described as the depressive episode mothers experience after giving birth, i.e. the postpartum period. What might usually start as 'postpartum/baby blues' – mild experiences of sadness, fear, loneliness, etc. – that occur immediately after giving birth and for days after, may bloom into PPD if untreated (American Psychological Association, 2022). Common symptoms include those similar to depressive symptoms: loss of pleasure, interest and motivation, crying spells, anger, anxiety and negative self evaluation. PPD can last weeks or months and develop into serious disorders like postpartum psychosis, wherein mothers go through psychotic episodes of hallucinations, delusions, endangering behaviour and other manic symptoms that pose risks to themselves and their child/children (American Psychological Association, 2022; O'Hara, 2009). PPD is one of the most common mood disorders experienced, with a global prevalence rate of 15% annually (Beck et al., 2006).

Several factors play into the onset of PPD: stressors like hormonal or nutritional fluctuations, physical and emotional exhaustion, childbirth trauma/injuries, genetic vulnerability, history of psychiatric disorders and various socio-cultural factors –isolation, social support and socio-economic elements– aggravate the disorder (Zaidi et al., 2017); an aspect that impacts PPD in the women of India greatly.

Indian society is generally considered collectivist– a practice of prioritizing a group's needs over individuals'. Hence, social units are intimately connected with one another, creating a closely-knit community (Singer & Cohn, 2017). These groups can create certain perceptions of mental health, stigmatizing it. This stems from the fear of the ill, which contributes to the stigma around mental health (Kishore et al., 2011). Indians also tend to turn to those close to them and religious/superstitious beliefs, making professional help a last resort (Goyal et al., 2015). As a

result, mental health symptoms are often somatized and ignored, being viewed as a sign of weakness or attention-seeking (Goyal et al., 2015).

In addition to this isolation, various factors which include but are not limited to: unsupportive and poor relationships with partners or families/in-laws, the unequal share of burdens in parental or extended familial responsibilities and ingrained cultural/religious beliefs exacerbate the condition in Indian women. This leads to a lack of support and services that can provide mothers with the necessary care to treat PPD, making it a common disorder both faced and unrecognized by both Indian mothers and healthcare. This is supported by its high prevalence of 22% (Upadhyay et al., 2017). While India's society has progressed, slowly mitigating the stigma, maternal psychological care is lacking, where healthcare workers are often uneducated and untrained in treating PPD, further pushing mothers into a world of isolation, where PPD overtakes their sense of self. Hence, PPD is a mood disorder that is overlooked but severely impacts a mother's functioning.

When PPD goes unnoticed, it infiltrates parents' lives, affecting motherly roles required to play such as feeding, sleeping, interacting and nurturing development. The symptoms can impact parental responsibilities such as lack of effort, responsiveness to needs, emotional detachment, nutrition and overall love and affection (Farías-Antúnez et al., 2018), which severely stunt child growth, physiologically, intellectually and psychologically (Upadhyay & Srivastava, 2016). Mothers are considered the primary caregivers of children, influencing attachment styles and various other traits that build a child's character. Therefore, any lack in these aspects can deteriorate their being, which prevail well into adulthood and impact children in various angles of life (Farías-Antúnez et al., 2018).

Therefore, this literature review aims to explore postpartum depression in Indian women, its contributing factors and its impact on child growth/development, as well as address current treatments for PPD and expand the field of treatment in India, encouraging changes in the healthcare system to promote access to seeking help for such disorders.

Risk factors of PPD in Indian Women

PPD is defined as *"a special state of mental health disorder and a variant of depression"* as per the WHO, which is *"characterized by a prolonged period of emotional disturbance, occurring at a time of major life change and increased responsibilities in the care of the newborn,"* as detailed by the APA (Zaidi et al., 2017), which can be observed from 4 weeks to 3-6 months after delivery (Aoyagi & Tsuchiya, 2019). While the phenomena of stress and anxiety when understanding the risks of raising a child is natural, prolonged observations and occurrence of symptoms and their elevated intensity present many risks that adversely affect family life and its dynamics

In India, the causes for PPD, excluding physiological factors, heavily rely on the various socio-cultural aspects of Indian society, which can include:

Low Socio-Economic Status (SES) is defined as *"having less access to financial, social, educational and health resources"* (*Definition of Socioeconomic Status - NCI Dictionary of Cancer Terms - NCI*, n.d.). Financial constraints, inaccessible healthcare, lack of education on

mental health, etc. inhibit mothers from the necessary means to raise an infant which can pose a risk for the occurrence of PPD (Goyal et al., 2010; GK & Arounassalame, 2014). Due to these hindrances, mothers are more likely to carry out home deliveries, increasing the risk of undiagnosed and untreated PPD (Upadhyay et al., 2017). The limited availability of essential resources for women contributes to the onset of PPD, making it difficult for affected women to seek treatment in a country where such services are sparse.

Lack of mental healthcare facilities in India –rural areas especially – can cause PPD to go untreated due to inadequate treatment for maternal mental health care. This scarcity contributes to the lack of awareness of PPD and other mental health disorders, leaving mothers oblivious to their depressive symptoms. *Lodha et al., 2022* confirms this, where the idea of PPD is unfamiliar amongst low-income mothers in Mumbai. It is also concluded that this is because there is *"a lack of education, insufficient attention to maternal health among the general public, deficiencies in maternal mental health services within health-care facilities and limited mental health training"* (Lodha et al., 2022). This promotes the stigmatization of mental health, where women might be reluctant to confide due to the taboos surrounding these psychiatric illnesses (Upadhyay et al., 2017) or do so as they fail to discern these symptoms because of the lack of information they have on such topics.

Low Education levels in mothers can pose a risk to PPD. Mothers with high educational levels might understand and recognize the symptoms of depression and therefore, will be able to seek out help when required (Agarwala et al., 2019). In contrast, lower educational levels in mothers restrict their ability to make rational and logical decisions, severely impeding their mental health as they may not be able to register their current feelings as concerning. Especially as the caregiver of a child, intelligence required for feeding practices and other necessities a child requires is lacking, increasing their psychological stress to care for a child, amplifying the onset of PPD (Anoop et al., 2004). In addition, educational levels of the father as well contribute to the incidence of PPD. Higher levels in men can decrease its risk as they better understand the symptoms and therefore, aid their partners and prevent PPD (Agarwala et al., 2019). Hence, lower educational levels result in a lack of understanding and assistance towards the mother's needs, contributing to the cause of PPD due to their marital isolation.

Poor relationship with partners and extended family/in-laws also contributes to the cause of PPD. Unsatisfying relationships with partners, such as improper attachment, poor communication, unequal partnership in parental responsibilities, lack of support and abusive relationships can further isolate a woman, potentially decreasing their self-esteem and increasing maternal stress and the burden of providing care for the infant (Modi et al., 2018; Gupta et al., 2021). Similarly, tense relations with family members and in-laws can limit the support the mother requires postpartum. Physical and emotional support plays a protective role as mothers are more vulnerable to PPD, and therefore, its deficiency can pose a risk to the onset of PPD (Gupta et al., 2021). Overall, any form of social support is necessary for the mother to prevent the deterioration of her mental and physical health as well as to ensure healthy child growth outcomes, while also allowing the mother to get the rest needed.

Unplanned pregnancies are a major factor contributing to the cause of PPD. Mothers with unplanned/unintended pregnancies were more likely to suffer from PPD, due to the potential burden of unexpected responsibilities they would have to bear when raising their child

(Zaidi et al., 2017). Moreover, it can cause overall dissatisfaction in life due to the increase in psychological stressors the mother may experience, such as learning how to care for the child. (Upadhyay & Srivastava, 2016). This can further pose a risk when the mother might engage in dangerous behaviours such as smoking, alcohol consumption and lack of self-care and parental care for the infant (Upadhyay & Srivastava, 2016).

The child's gender is a deeply-rooted cultural belief in Indian families, where boys have been preferred over girls, who are 'more capable' of providing for the parents as they age, in terms of financial and emotional support, believing that girls will not be able to care for their older parents due to marital responsibilities (Pande & Malhotra, n.d.). Therefore, when giving birth to a girl, it is often believed to be some sort of misfortune and 'curse' on the family (Gupta et al., 2021). These superstitious beliefs can stress the mother out and cause low self-esteem and confidence, especially when they are blamed for the misfortune, creating a feeling of self-consciousness (Gupta et al., 2021). This can also cause a lack of support from partners and family, confining women within their negative emotions and ultimately, increasing the risk of PPD. When mothers hold such beliefs as well, they may be unsatisfied with having a child of the unintended gender, therefore they might be negligent towards their child, disregarding their demands.

The age of the mother might also facilitate the incidence of PPD. Mothers of old age can suffer more due to the physical and emotional complications they might experience at that age. Giving birth at older ages can pose risks to a mother's health due to the susceptibility of many birth or pregnancy complications (Upadhyay et al., 2017). On the other hand, younger women are also prone to PPD, where the transition into motherhood is overwhelming, especially for those who are maturing and gaining independence. This can lead to significant psychological distress, which can develop into PPD (Zaidi et al., 2017).

The various factors that play into the presence of PPD in women are crucial to understand as recognizing these crucial stressors can help in determining interventions and beneficial treatments that can prevent or eradicate the impact of its negative symptoms, while also promoting maternal mental health to encouraging mothers in similar situations to seek help.

Research Method

1. Search Strategy

The studies used throughout the study were selected by using search engines such as Google Scholar, ResearchGate, PubMed, Wiley Online Library and Science Direct. Certain keywords were used in order to narrow the studies down, such as Postpartum/postnatal/perinatal/after-birth depression, PPD, PPD in India, PPD risk factors, PPD prevalence rates, effect of PPD on child growth/development, impact of PPD on child growth and development in India and treatments for PPD. Studies used were research that were done in the last two decades.

2. Article Selection

Studies were selected on the basis of language, if they were written in English or translated to English, included patients diagnosed prior or during the study for postpartum depression and used samples in Indian regions that evaluated child growth/development on a physical, cognitive and intellectual basis. Studies were also chosen if they had certain exclusion criteria, such as mothers raising children independently, who have health conditions, partners that do not live with each other, those with adopted children, divorced, homosexual and other sexualities under the LGBTQIA+ orientations.

Literature Review

Various studies have investigated and evaluated the relationship between PPD and child growth/development, as summarized in *Table 1.*

Reference	Region of study	Sample characteristics	Scale used	Procedure	Findings	Evaluation
(Shriyan et al., 2023)	Bengaluru	4829 pregnant women aged 14-32 weeks. 2647 were assessed at birth follow-up and 1800 14 weeks later and 1135 at the 1-year follow-up.	EPDS* translated to the required language.	Information of demographics, obstetric details, social support and depressive symptoms during pregnancy and after delivery, 4 weeks and 1 year after. Infants were measured on comorbidities, feeding practices and developmental growth.	Infants with mothers who were depressed at birth were likely to have a larger waist circumference and sum of skinfold thickness. Additionally, they were more likely to have stunted growth.	The study uses a large sample of women. Also used a universal scale for depression and its effect. The sample was of lower socio-economic status, hence generalization is limited.
(Anoop et al., 2004)	Vellore, Tamil Nadu	72 children with malnutrition were assessed and compared to 72 other children as a control	Clinical Interview for DSM III R translated in Tamil.	Infant's height, weight and cognitive milestones were recorded. Mothers of these infants were interviewed to determine factors associated with	Major depression in the postpartum period, current depression and low maternal intelligence were associated	Presence of the control group made the comparison significant. The use of a standard clinical interview translated

		with ages of 6-12 months.		malnutrition.	with malnutrition. The severity of malnutrition was also associated with these factors.	ensured data was accurately collected and sufficient. Small sample size with specific characteristics (age) makes it difficult to generalize.
(Joshi & Raut, 2019)	Unspecified (Central India)	300 mothers and their infants were recruited from visits in the immunization clinic of a hospital.	EPDS	An interview was conducted to collect socio-demographic information. The mothers were assessed with the EPDS and were treated for depression.	Mothers diagnosed were likely to not engage in responsive feeding. Furthermore, the mean weight of infants with depressed mothers was higher than average.	Limited generalizability due to specific samples. The questionnaires include sensitive topics that may be underreported, influencing results. Additionally, the sample is subjected to sample biases due to it being a hospital-based sample.
(Amipara et al., 2020)	Anganwadi centers of Valsad District, Gujarat	116 mothers attending Anganwadi centers (AWC)*	EPDS in Gujarati	They were firstly screened with the EPDS and then, divided into ‘likely depressed’ and ‘nondepressed’ groups, to examine breastfeeding practices according to the	8 mothers were found depressed. Of 94 children, 15 were malnourished with 1 mother having PPD, while 8 were severely malnourished, with 2 of the	Limited generalization. Data may be inaccurate due to self-reported data.

				WHO Infant and Young Child Feeding Practices (IYCF).	mothers having PPD.	
(Upadhyay & Srivastava, 2016)	Andhra Pradesh	1183 children from the Young Lives study were used, between ages 5-21 months.	WHO Self-reported Question	Information on health, unintended pregnancies, depressive symptoms and other factors were collected through questionnaires.	Those born from unintended pregnancies were likely to be stunted. Stunted growth in children was associated with more depressive symptoms.	The study could not distinguish between unintended and mistimed pregnancies. The study fails to use a standardized scale for depressive symptoms, which can help in identifying specific risk factors.
(Mhamane et al., 2024)	Mumbai slums – Jari Mari, Lal Bahadur Shastri (LBS) Nagar and Kajupada	314 samples of mothers with children either below 6 months or age or above, up until 2 years.	EPDS and WHO IYCF* module	Mothers were required to answer questions related to demographics, medical history, diet recall and nutritional assessment of the child as per the IYCF.	Infants of depressed mothers were underweight, stunted. In those under 6 months, bottle-feeding, delayed or non-exclusive breastfeeding were linked to PPD and for 6–24 months, low meal frequency, poor diet diversity, and early solids introduction were also	The study considers different periods of PPD, instead of what is considered as PPD (6-8 weeks after birth).

					associated.	
(Patel et al., 2003)	Goa	171 infants from a district hospital with an average age of 7.4 weeks.	EPDS translated into Konkani and DASII*	Infants' weights were measured 6-8 weeks post-birth. Growth outcomes from the sample of infants with depressed mothers (experimental) and a control group were measured 6 months after birth with the use of DASII.	Underweight babies were associated with maternal PPD. Babies in the experimental group had worse mental development scores.	Sample is not representative of all mothers in the area; it excluded those with problematic pregnancies, those who opted for private healthcare, etc. Additionally, maternal IQ had an association with growth but was not studied.
(Roy et al., 2022)	Kolkata	174 mothers-child pairs	EPDS translated into Bengali, FSS* and DASII.	A semi-structured questionnaire was used to collect information on age, income and other demographic factors. After 3-6 months, FSS and EPDS were completed. 1 year later, the DASII was done.	Antenatal depression predicted PPD. Those with antenatal depression had a low family support system and their children were most likely to have low motor and cognitive attainment at 12 months old.	Small sample size decreases its reliability. The use of standardized screening tools ensures that no personal research bias influences data collection. Risk factors such as unintended pregnancies, employment status, etc. were neither recorded nor considered in the study.

(Nguyen et al., 2018)	Madhya Pradesh	2934 mother-child pairs	ASQ-3*, CES-D-10* translated into Hindi.	Screening tests were conducted by the mothers and results were compared to the WHO child growth standards, controlling any socio-economic variables.	Maternal depressive symptoms were classified as low, medium, or high. High symptom scores were associated with lower height/weight and an increased risk of developmental delays.	The ASQ screening is confined to low-income settings, which limits its generalizability, and the study's cross-sectional design fails to establish causality.

***Table 1**: Studies investigating the impact of PPD on child growth outcomes.*

*EPDS (Edinburgh Postnatal Depression Scale): 10-item questionnaire used to identify PPD in mothers (Cox & Holden, 1987); IYCF (Infant and Young Child Feeding Practices): Data collected by WHO that determines different indicators of infant feeding practices to meet sufficient nutritional requirement to support growth and development (*Infant and Young Child Feeding*, 2023); DASII (Developmental Assessment Scale for Indian Infants): Provides detailed analysis on Indian infants' cognitive abilities (Madaan et al., 2021); FSS (Family Support Scale) measures different sources of support to parents in raising their child (Dunst et al., 1987); ASQ-3 (Ages & Stages Questionnaire): Evaluates the developmental progress in children (Squires & Bricker, 2009); CES-D-10 (Center of Epidemiologic Studies Depression Scale) is a 10-item questionnaire used to identify depressive symptoms (Andresen et al., 1994); Anganwadi Centers (AWCs) are the primary public health-care facilities in Indian villages to be accessed by all.

Discussion

This review explores the different risk factors of PPD in Indian women and how they can impact a child's growth and development, physically and psychologically. While it is normal to experience the 'baby blues' after giving birth caused by the stress of raising the child and the sacrifices or responsibilities that come with it, PPD symptoms stem from many other factors that can impair a mother's ability to nurture a child's growth, adversely impacting their growth and health (American Psychological Association, 2022; Anoop et al., 2004). The impacts of PPD can come in the form of direct exposure to a mother's depressive symptoms, parenting difficulties as a result of these symptoms and other risk factors of PPD, including poverty, financial struggles, etc. (Patel et al., 2003).

Table 1 summarizes various studies that investigate this topic. One primary finding observed is that infants with depressed mothers have an increased risk of being underweight, under the recommended height or malnourished. This stems from the fact that PPD can cause a loss of motivation in mothers, resulting in a lack of initiative to conduct feeding practices such as breastfeeding during the weaning period, depriving infants of essential nutrients (Anoop et al., 2004; Kapoor, 2021). Cessation and delay in exclusive breastfeeding and other practices such as *"meal frequency, dietary diversity, low fruit and vegetable intake, and early introduction of solids"* (Mhamane et al., 2024) severely stunt a child's growth, which is also another finding seen in the studies (Patel et al., 2003). The more severe the PPD symptoms are, the more malnourished and stunted growth can be observed in infants. In contrast, infant adiposity is also a finding noticed in *Shriyan et al.*, where increased body fat and thick skinfolds were noticed in infants with depressed mothers. This, once again, indicates that mothers with emotional detachment with their child might not pay adequate attention to their child's needs, which includes feeding patterns. Hence, it is possible that PPD can also cause health complications like being overweight and stunting due to inattention (Shriyan et al., 2023). Furthermore, this lack of initiative also leads to a feeling of emotional disconnection between a mother and child, translating into psychological and intellectual deprivation, leading to developmental delays in children (Patel et al., 2003; Roy et al., 2022; Nguyen et al., 2018).

The majority of the studies sample mothers from various rural areas within India, indicating that PPD's prevalence is relatively higher in these regions (Upadhyay et al., 2017). Results from socio demographic questions found that many women report being of lower socio-economic status, intelligence, unawareness of mental health in general and disturbances in relationships, with partners and families. Information on these factors also brings attention to the importance of social support, where studies have shown that PPD mediated by social support reduces the chances of infants being malnourished and having health problems. These factors may contribute to the disruption in mother-child bonds, making mothers emotionally unavailable for their children and less engaging in motherly routines that stimulate growth in infants (Kapoor, 2021). These conclusions line up with the studies summarized in *Table 1*, deducing that poor maternal mental health elicits poor child growth (Aoyagi & Tsuchiya, 2019).

Taking into account the grave effect of PPD on maternal and child well-being, it is critical to explore different treatment methods that can mitigate the negative symptoms of PPD to prevent the deterioration of both the mother and the child's physical and emotional health, which can have serious implications on their lives and those around them as well.

Current Treatments for PPD:

Treating PPD is beneficial, not only for the mother but also for the child and other individuals involved. Over the years, various treatments have been introduced, both psychological and pharmacological, and proved to be effective in managing PPD and its symptoms.

Many therapeutic treatments have been proposed and studied for their effect in alleviating the negative symptoms of PPD. For instance, Interpersonal Therapy (IPT), is a form of therapy that addresses depressive symptoms by understanding the complexities of relationships and how they might impact one's mood. It has been discovered that it can help in

improving mother-infant relationships, eradicating depressive symptoms and improving their mood. This can prompt mothers to become more engaged and attentive in their infant's lives, nourishing their growth (Fitelson et al., 2010; Saharoy et al., 2023). Another form of therapy that is effective in treating PPD is Cognitive Behavioural Therapy (CBT), wherein the primary objective is to alter negative cognitive patterns that correlate to mood to promote healthier coping mechanisms and overall, change the way one thinks of oneself (Fitelson et al., 2010). This can alleviate PPD symptoms as it can help mothers change their negative thinking patterns and make positive changes to their lives, to improve their mental health. By improving thinking patterns in mothers, it can give rise to healthier mother-child dynamics, making them more involved in their child's lives. These therapies have scientific evidence that supports their efficacy in mitigating PPD symptoms (Dennis & Hodnett, 2007).

Additionally, pharmacological interventions have also been effective in treating PPD, especially when one fails to respond to therapeutic treatments. *Ng. et al.'s* meta-analysis on pharmacological treatments has shown that antidepressants – selective serotonin reuptake inhibitors (SSRIs) like fluoxetine, venlafaxine, etc. — and other medications like bupropion have been successful in alleviating depressive and anxious symptoms in women with PPD (Ng. et al., 2012; Saharoy et al., 2023). This may be due to the fact that SSRIs are commonly used in general practices when treating those with depressive disorders and hence, can treat PPD as well due to the similarity in depressive symptoms in both mood disorders. However, further research is required on the safety of psychiatric medication due to the dangers it poses, including infecting breastmilk and exposing infants to medication at a young age (Dennis & Hodnett, 2007).

Many studies have shown that combining psychological and pharmacological treatments is the most effective in treating PPD as they complement one another (Dennis & Hodnett, 2007). Medication can target the physiological factors in depressive symptoms and make therapy more effective for mothers. Psychiatric medicines can alleviate symptoms, encouraging mothers to take more initiative in motherhood, while therapy can help in managing emotions and behavioural tendencies in response to certain stimuli. Especially since it is hard to determine the main factor contributing to PPD, combining medication and therapy can help target the different potential risk factors, whether it is biological, physiological, psychological and cultural.

However, the efficacy of these treatments in India have yet to be studied. Due to the stigma around mental health and the general lack of healthcare sectors dedicated to maternal mental health care, the efficacy of these treatments is inconclusive. Seeking professional help is seen as difficult and might make mothers reluctant to be treated, especially when it is possible to be ridiculed for being a 'bad mother' for needing medication and therapy (Dennis & Hodnett, 2007; Shelke & Chakole, 2022). India's healthcare facilities have become more expansive and inclusive to all, and its society has become more understanding and accepting of mental health, being more open to treating different disorders. It is crucial that healthcare facilities are educated and trained to treat PPD to prevent its dangers. In addition, educating Indians about maternal care and how to recognize PPD can help in early intervention. *Saharoy et al.* also suggest home support groups that can provide necessary care to mothers within their households. This can help those who go through home deliveries of their child, ensuring that they receive beneficial care despite not visiting any healthcare facilities (Saharoy et al., 2023).

Therefore, it is important to study the effect of PPD on child growth in modern contexts, which can also provide insight into how PPD is becoming recognized in modern Indian society.

Overall, the field of PPD requires further research to fill in essential gaps in knowledge that can help in understanding how PPD in women of different backgrounds can impact different individuals, improving its diagnosis and tailoring treatments, expanding them and introducing relevant methods that ensure all affected mothers can be treated.

Future Directions:

The field of maternal postpartum depression has many different aspects that must be addressed to understand how PPD functions in real-life contexts. While various studies confirm that PPD stunt physiological growth in infants in India, there is a lack of evidence that explores the effect of PPD on intellectual and psychological growth in Indian children. *Ali et al., 2013* and *Quevedo et al., 2011* have investigated the effects of PPD on the mental development of children, concluding that children with depressed mothers have delayed mental development and poorer language development. Therefore, extensive research is crucial as it can help us understand how PPD infiltrates a child's life and impacts various aspects of their growth, emphasizing the need to intervene and treat PPD.

Furthermore, the time frame for the occurrence of PPD is undefined, as it can affect mothers weeks, months and years after giving birth (Upadhyay et al., 2017). Many studies summarized in *Table 1* use cross-sectional, quasi, community or hospital-based research designs, which helps address the immediate impact of PPD on infants, namely from 6 months to 2 years old. Longitudinal and prospective studies can provide insight into how PPD can prevail for long periods of time and how it can impact children as they grow older. Understanding how the effects of a deprived childhood impact the growth of a child can help us understand the severity of PPD. Many studies also tend to utilize samples from rural areas or mothers of lower socio-economic status. While it is important to study PPD in these regions, evidence regarding the effect of PPD in mothers of middle-class and socio-economic status must be sought after to apply current findings to different groups of women with different backgrounds and resources. It can also help in identifying other risk factors of PPD, where status and access to healthcare facilities might not have any impact on its onset, providing further insight into cultural and religious factors/practices that play a role. Moreover, it is crucial to investigate the effect of PPD in mothers of different backgrounds, such as those part of the LGBTQIA+ community, surrogate and adoptive mothers to understand the causes of PPD in different cases, expanding on the current risk factors discussed. Lastly, studying the effect of PPD on different children, such as twins/triplets and more, those with certain health conditions, intellectual or physical disabilities can make the findings current literature has derived more applicable to real-life contexts, allowing it to be generalized to mothers and children from diverse backgrounds within India.

Screening tools and scales have been used to identify and diagnose mothers with PPD. The studies in *Table 1* majorly used the EPDS translated into native languages spoken by the sample. This helps provide a standardized perspective into PPD in these mothers. However, an implication of its usage is that these assessments heavily rely on the participants' responses and hence, are subjected to biases where self-reported data may be distorted and inaccurate. Therefore, tools must be developed to ensure that PPD can be diagnosed on the basis of not

only a patient's report, but also what is observed by researchers and healthcare workers, to prevent potential misdiagnosis. Furthermore, screening tools developed for a specific culture are crucial as the questions and assessment of PPD in standardized tools such as the EDPS are mostly based on Western culture, where certain symptoms that are under the criteria of PPD may differ from what individuals might consider a symptom. For example, many studies used the DASII to assess infant growth in Indian children specifically. Similarly, tools tailored to a specific culture can help in diagnosing PPD more accurately.

All in all, further research and evidence are crucial to expand the current understanding of PPD in India and make it applicable to women from various backgrounds, improving current treatments and tailoring it to Indian culture to ensure its efficacy.

Limitations

This review curated articles from English databases and hence, it might not include studies under the same topic of research that can provide evidence. Furthermore, the review does not take into account physiological conditions such as history of psychiatric illnesses and other health complications, hence the results and conclusions derived might vary and not be accurate to all affected women. Furthermore, most studies used the EPDS scale with varied cutoff scores and hence, PPD might have been diagnosed differently in each sample, limiting the reliability of the data. In addition, most samples from the studies used are similar, such as mothers from rural areas or of lower socioeconomic statuses, which limits its generalizability to its target population, being Indian mothers of any context.

Conclusion

In conclusion, maternal PPD in Indian women can gravely impact children in terms of physiological, psychological and intellectual development. Though it is a current area of research that requires more evidence, it has the potential to shatter the stigma around mental health in India, encouraging the expansion of maternal mental healthcare facilities. It also helps in recognizing and early intervention to treat PPD and prevent mothers from putting their own as well as their child/children's lives at risk.

References

1. Agarwala, A., Arathi Rao, P., & Narayanan, P. (2019). Prevalence and predictors of postpartum depression among mothers in the rural areas of Udupi Taluk, Karnataka, India: A cross-sectional study. *Clinical Epidemiology and Global Health*, *7*(3), 342–345. https://doi.org/10.1016/j.cegh.2018.08.009
2. Ali, N. S., Mahmud, S., Khan, A., & Ali, B. S. (2013). Impact of postpartum anxiety and depression on child's mental development from two peri-urban communities of Karachi, Pakistan: a quasi-experimental study. *BMC Psychiatry*, *13*(1), 274. https://doi.org/10.1186/1471-244x-13-274
3. American Psychological Association. (2022). *Postpartum depression: Causes, symptoms, risk factors, and treatment options*. Apa.org. https://www.apa.org/topics/women-girls/postpartum-depression
4. Andresen, E. M., Malmgren, J. A., Carter, W. B., & Patrick, D. L. (1994). Screening for Depression in Well Older Adults: Evaluation of a Short Form of the CES-D. *American Journal of Preventive Medicine*, *10*(2), 77–84. https://doi.org/10.1016/s0749-3797(18)30622-6
5. Anoop, S. (2004). Maternal depression and low maternal intelligence as risk factors for malnutrition in children: a community based case-control study from South India. *Archives of Disease in Childhood*, *89*(4), 325–329. https://doi.org/10.1136/adc.2002.009738
6. Aoyagi, S., & Tsuchiya, K. J. (2019). Does maternal postpartum depression affect children's developmental outcomes? *Journal of Obstetrics and Gynaecology Research*, *45*(9), 1809–1820. https://doi.org/10.1111/jog.14064
7. Baria, H., Amipara, T., & Nayak, S. (2020). A study on postpartum depression and its association with infant feeding practices and infant nutritional status among mothers attending the anganwadi centers of Valsad district, Gujarat, India. *Indian Journal of Community Medicine*, *45*(3), 299. https://doi.org/10.4103/ijcm.ijcm_171_19
8. Beck, C. T., Records, K., & Rice, M. (2006). Further Development of the Postpartum Depression Predictors Inventory-Revised. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, *35*(6), 735–745. https://doi.org/10.1111/j.1552-6909.2006.00094.x
9. Cohn, B. S., & Singer, M. B. (1970). *Structure and change in Indian society*. Aldine.
10. Cox, J. L., Holden, J. M., & Sagovsky, R. (1987). Detection of Postnatal Depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry*, *150*(6), 782–786. https://doi.org/10.1192/bjp.150.6.782
11. Dennis, C.-L., & Hodnett, E. D. (2007). Psychosocial and psychological interventions for treating postpartum depression. *Cochrane Database of Systematic Reviews*, *1*(4), CD006116. https://doi.org/10.1002/14651858.cd006116.pub2
12. Dunst, C. J., Trivette, C. M., & Cross, A. H. (1986). Family Support Scale. *PsycTESTS Dataset*. https://doi.org/10.1037/t59027-000
13. Farías-Antúnez, S., Xavier, M. O., & Santos, I. S. (2018). Effect of maternal postpartum depression on offspring's growth. *Journal of Affective Disorders*, *228*, 143–152. https://doi.org/10.1016/j.jad.2017.12.013
14. GK, P., & Arounassalame, B. (2014). Impact of socio-cultural factors on postpartum depression in South Indian women. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, 338–343. https://doi.org/10.5455/2320-1770.ijrcog20140610

15. Goyal, D., Gay, C., & Lee, K. A. (2010). How Much Does Low Socioeconomic Status Increase the Risk of Prenatal and Postpartum Depressive Symptoms in First-Time Mothers? *Women's Health Issues*, *20*(2), 96–104. https://doi.org/10.1016/j.whi.2009.11.003
16. Gupta, S., Kishore, J., Mala, Y. M., Ramji, S., & Aggarwal, R. (2013). Postpartum Depression in North Indian Women: Prevalence and Risk Factors. *The Journal of Obstetrics and Gynecology of India*, *63*(4), 223–229. https://doi.org/10.1007/s13224-013-0399-x
17. Kapoor, D. A. (2021). A Critical Analysis of the Biopsychosocial Risks Associated with Postpartum Depression in Indian Mothers. *Inquiries Journal*, *13*(02), 1. http://www.inquiriesjournal.com/articles/1880/a-critical-analysis-of-the-biopsychosocial-risks-associated-with-postpartum-depression-in-indian-mothers
18. Kishore, J., Jiloha, R., Gupta, A., & Bantman, P. (2011). Myths, beliefs and perceptions about mental disorders and health-seeking behavior in Delhi, India. *Indian Journal of Psychiatry*, *53*(4), 324–329. https://doi.org/10.4103/0019-5545.91906
19. Leight, K., Fitelson, E., Kim, S., & Baker, A. (2010). Treatment of post-partum depression: a review of clinical, psychological and pharmacological options. *International Journal of Women's Health*, *3*(3), 1–14. https://doi.org/10.2147/ijwh.s6938
20. Lodha, P., Jahangir, T., Karia, S., DeSousa, A., Appasani, R., & Withers, M. (2022). Perceptions of perinatal depression among low-income mothers and families in Mumbai, India. *Asian Journal of Psychiatry*, *71*, 103048. https://doi.org/10.1016/j.ajp.2022.103048
21. Madaan, P., Saini, L., & Sondhi, V. (2021). Development Assessment Scale for Indian Infants: A Systematic Review and Perspective on Dwindling Cutoffs. *Indian Journal of Pediatrics*, *88*(9), 918–920. https://doi.org/10.1007/s12098-021-03671-2
22. Mhamane, S., Karande, Y., & Ramanathan, V. (2024). Post-partum depression: Its association with IYCF practices and effect on child growth indicators in urban slums of Mumbai, India. *Clinical Epidemiology and Global Health*, *28*, 101667. https://doi.org/10.1016/j.cegh.2024.101667
23. National Cancer Institute. (2011, February 2). *Socioeconomic Status*. Www.cancer.gov; National Cancer Institute. https://www.cancer.gov/publications/dictionaries/cancer-terms/def/socioeconomic-status
24. Ng, R. C., Hirata, C. K., Yeung, W., Haller, E., & Finley, P. R. (2010). Pharmacologic Treatment for Postpartum Depression: A Systematic Review. *Pharmacotherapy*, *30*(9), 928–941. https://doi.org/10.1592/phco.30.9.928
25. Nguyen, P. H., Friedman, J., Kak, M., Menon, P., & Alderman, H. (2018). Maternal depressive symptoms are negatively associated with child growth and development: Evidence from rural I ndia. *Maternal & Child Nutrition*, *14*(4), e12621. https://doi.org/10.1111/mcn.12621
26. O'Hara, M. W. (2009). Postpartum depression: what we know. *Journal of Clinical Psychology*, *65*(12), 1258–1269. Wiley Online Library. https://doi.org/10.1002/jclp.20644
27. Pande, R., & Malhotra, A. (2006). *Son Preference and Daughter Neglect in India What Happens to Living Girls?*https://www.unfpa.org/sites/default/files/resource-pdf/UNFPA_Publication-39764.pdf

28. Parikh, M. N., Modi, V. P., & Valipay, S. K. (2018). A study on prevalence of postpartum depression and correlation with risk factors. *Annals of Indian Psychiatry*, *2*(1), 27. https://doi.org/10.4103/aip.aip_48_17
29. Patel, V. (2003). Postnatal depression and infant growth and development in low income countries: a cohort study from Goa, India. *Archives of Disease in Childhood*, *88*(1), 34–37. https://doi.org/10.1136/adc.88.1.34
30. Quevedo, L. A., Silva, R. A., Godoy, R., Jansen, K., Matos, M. B., Tavares Pinheiro, K. A., & Pinheiro, R. T. (2011). The impact of maternal post-partum depression on the language development of children at 12 months. *Child: Care, Health and Development*, *38*(3), 420–424. https://doi.org/10.1111/j.1365-2214.2011.01251.x
31. Raut, A., & Joshi, M. (2019). Maternal depression and its association with responsive feeding and nutritional status of infants: A cross-sectional study from a rural medical college in central India. *Journal of Postgraduate Medicine*, *65*(4), 212. https://doi.org/10.4103/jpgm.jpgm_479_18
32. Roy, R., Chakraborty, M., Bhattacharya, K., Roychoudhury, T., & Mukherjee, S. (2022). Impact of perinatal maternal depression on child development. *Indian Journal of Psychiatry*, *64*(3), 284–288. Indian Journal of Psychiatry. https://doi.org/10.4103/indianjpsychiatry.indianjpsychiatry_1318_2
33. Saharoy, R., Potdukhe, A., Wanjari, M., & Taksande, A. B. (2023). Postpartum Depression and Maternal care: Exploring the complex effects on Mothers and Infants. *Cureus*, *15*(7), e41381. https://doi.org/10.7759/cureus.41381
34. Shelke, A., & Chakole, S. (2022). A Review on Risk Factors of Postpartum Depression in India and Its Management. *Cureus*, *14*(9), e29150. https://doi.org/10.7759/cureus.29150
35. Shriyan, P., Khetrapal, S., van Schayck, O. C. P., & Babu, G. R. (2023). Maternal depressiveness and infant growth outcomes: Findings from the MAASTHI cohort study in India. *Journal of Psychosomatic Research*, *170*, 111378. https://doi.org/10.1016/j.jpsychores.2023.111378
36. Squires, J., Bricker, D., Clifford, J., Murphy, K., Hoselton, R., Potter, L., Mounts, L., & Farrell, J. (2009). *Ages & Stages Questionnaires ® A Parent-Completed Child Monitoring System THIRD EDITION ASQ-3™ CD-ROM*. http://www.bestkc.com/wp-content/uploads/2017/05/3-year-ASQ-ENGLISH.pdf
37. Upadhyay, A. K., & Srivastava, S. (2016). Effect of pregnancy intention, postnatal depressive symptoms and social support on early childhood stunting: findings from India. *BMC Pregnancy and Childbirth*, *16*(1). https://doi.org/10.1186/s12884-016-0909-9
38. Upadhyay, R. P., Chowdhury, R., Aslyeh Salehi, Sarkar, K., Singh, S. K., Sinha, B., Pawar, A., Rajalakshmi, A. K., & Kumar, A. (2017). Postpartum depression in India: a systematic review and meta-analysis. *Bulletin of the World Health Organization*, *95*(10), 706–717C. https://doi.org/10.2471/blt.17.192237
39. World Health Organization. (2023). *Infant and Young Child Feeding*. World Health Organization. https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding
40. Zaidi, F., Nigam, A., Anjum, R., & Agarwalla, R. (2017). Postpartum Depression in Women: A Risk Factor Analysis. *JOURNAL of CLINICAL and DIAGNOSTIC RESEARCH*, *11*(8), QC13–QC16. https://doi.org/10.7860/jcdr/2017/25480.10479