

Postpartum Depression in Urban India: A Pilot Study from Prayagraj District, India

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Abstract

Postpartum depression (PPD) affects maternal well-being, infant care, and family functioning. In India, however, postpartum mental health services remain limited, while evidence from urban North India is still insufficient, particularly regarding the influence of household relationships, reproductive expectations, and psychosocial support. This pilot study aimed to estimate PPD risk and examine associated sociodemographic, obstetric, psychosocial, and cultural factors among postpartum women in Chak Dondi, Naini, Prayagraj. Using a cross-sectional design, 30 women within six months of delivery were selected through purposive sampling. Data were collected using the Edinburgh Postnatal Depression Scale and a structured questionnaire, then analysed through descriptive statistics and exploratory bivariate tests. Findings show that 23.3% of participants screened positive for possible PPD. Higher risk was associated with younger age, financial dependence, nuclear family structure, psychiatric history, unplanned pregnancy, obstetric complications, son preference, domestic violence, strained family relationships, and limited in-law support, while family support appeared protective. The study contributes preliminary evidence from an under-researched urban North Indian setting. Its findings support integrating routine screening, counselling, referral, and family-centred support into maternal healthcare. Given the small purposive sample, larger studies are required to confirm these patterns.

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INTRODUCTION

Postpartum depression (PPD) is a major maternal mental health concern with consequences that extend beyond the individual mother to infant development, marital relationships, caregiving practices and wider family well-being. Pregnancy and the postpartum period involve substantial physiological, psychological and social transitions, and these transitions may increase women's vulnerability to anxiety, depression and other perinatal mental health conditions (Gelaye et al. 2016; Biaggi et al. 2016; Dennis, Falah-Hassani, and Shiri 2017; Ghaedrahmati et al. 2017; Howard and Khalifeh 2020). PPD is commonly distinguished from transient postpartum mood disturbance by the persistence and severity of symptoms, including prolonged sadness, anxiety, fatigue, sleep disturbance, irritability, feelings of inadequacy and emotional detachment from the infant. Unlike transient "baby blues," PPD is characterized by prolonged sadness, anxiety, fatigue, sleep disturbances and emotional detachment from the infant, all of which can negatively affect maternal functioning and child development (O'Hara and McCabe 2013; Tosto et al. 2023; Khamidullina et al. 2025; Wilson, Lee, and Bei 2019; Slomian et al. 2019; O'Dea et al. 2023). When untreated, these symptoms may impair maternal functioning, weaken mother–infant bonding and affect children's cognitive, behavioural and emotional development (Slomian et al. 2019; O'Dea et al. 2023; Faisal-Cury et al. 2021; Alfayumi-Zeadna et al. 2025; Santos et al. 2024; Sasayama et al. 2025).

Although PPD is now widely recognized as a public health issue, it remains underdiagnosed and undertreated in many low- and middle-income countries. Global estimates vary across regions, screening tools, sample characteristics and timing of assessment, but recent systematic reviews consistently show that postpartum and perinatal depression affect a substantial proportion of women, particularly in settings where poverty, gender inequality, limited health services and weak psychosocial support intersect (Hahn-Holbrook, Cornwell-Hinrichs, and Anaya 2018; Shorey et al. 2018; Mitchell et al. 2023). In India, a systematic review and meta-analysis estimated the pooled prevalence of postpartum depression at approximately 22 percent, indicating that PPD is not a marginal condition but a significant maternal health burden (Upadhyay et al. 2017). Yet

maternal health services in India have historically prioritized physical and obstetric outcomes, while mental health screening, counselling and referral remain insufficiently integrated into routine antenatal and postnatal care (Mellers et al. 2025).

The problem is therefore not only clinical but also social and cultural. Previous studies have identified multiple risk factors associated with PPD, including previous mental illness, obstetric complications, unplanned or unwanted pregnancy, financial stress, domestic violence, poor partner support and low social support (Biaggi et al. 2016; Ghaedrahmati et al. 2017; Hutchens and Kearney 2020; Tolossa et al. 2020; Qiu et al. 2020; Desta et al. 2021; Yang, Wu, and Chen 2022; Gastaldon et al. 2022; Aslam et al. 2022; Cárdenas et al. 2025). In the Indian context, these risks may be intensified by gendered family expectations, son preference, strained relationships with spouses or in-laws, restrictions on women's mobility and the unequal distribution of caregiving and domestic labour. Such factors can shape not only the likelihood of depressive symptoms, but also whether women recognize distress as a health concern, disclose it to family members and seek professional help (Place et al. 2024; Aslam et al. 2022).

Despite growing research on PPD in India, important gaps remain. Existing studies have generated valuable prevalence estimates and identified broad risk factors, but less is known about how PPD is shaped in specific urban North Indian settings where rapid social change and persistent gender norms operate together. Much of the Indian evidence is national, regional or facility-based, while comparatively fewer studies examine urban communities in Uttar Pradesh, particularly places such as Prayagraj, where nuclear family arrangements, financial insecurity, migration, changing household structures and continuing expectations around male children may influence postpartum mental health. This gap matters because the determinants of PPD are not uniform; they are produced through local configurations of family structure, gender relations, health-service access and cultural expectations.

This pilot study therefore examines postpartum depression among women in an urban area of Prayagraj district, Uttar Pradesh. It asks: What is the prevalence of PPD among postpartum women in this setting? Which socio-demographic, obstetric, psychosocial and cultural factors are associated with PPD? How do family structure, gender preference and support systems shape women's vulnerability to postpartum depressive symptoms? By addressing these questions, the study moves beyond a purely biomedical understanding of PPD and situates maternal mental health within the everyday social conditions of postpartum life.

The significance of the study lies in its attention to a locally grounded but wider public health issue. Early identification of PPD can support timely counselling, referral and family-level intervention, while context-specific evidence can help health workers and policymakers design more responsive maternal mental health services. In urban North India, where women may be physically close to health facilities but socially constrained by stigma, household expectations or limited decision-making power, understanding the social determinants of PPD is essential for improving screening and care.

The study contributes in three ways. Empirically, it provides preliminary evidence on the prevalence and correlates of PPD in an under-researched urban setting in Uttar Pradesh. Analytically, it highlights the interaction between individual risk factors and socio-cultural conditions such as family structure, support networks and son preference. Practically, it offers evidence that may inform larger community-based studies, maternal mental health awareness programmes and the integration of psychosocial screening into postnatal care.

The theoretical entry point of the study is a social determinants and socio-ecological understanding of maternal mental health. From this perspective, this study argues that PPD is not treated only as an individual psychological condition, but as an outcome shaped by layered influences: personal history, obstetric experience, household relations, economic insecurity, gender norms, community attitudes and health-system capacity. This framework is useful for examining how postpartum distress emerges at the intersection of body, family, culture and care infrastructure.

METHODS

Research Design

This study used an exploratory cross-sectional pilot design to examine postpartum depression (PPD) and its associated socio-demographic, obstetric, psychosocial and cultural factors among postpartum women in an urban community of Prayagraj district, Uttar Pradesh, India. The design was appropriate because the study aimed to estimate the preliminary prevalence of depressive symptoms, assess the feasibility of the research procedures and identify possible risk patterns for future large-scale investigation. As a pilot study, the research was not intended to establish causal relationships or produce population-level generalizations. Instead, it was designed to generate context-specific preliminary evidence and refine the methodological approach for a larger proposed study.

Case Selection and Study Context

The study was conducted in Chak Dondi, Naini, an urban locality in Prayagraj district, Uttar Pradesh. This site was selected because it represents an urban community marked by mixed socio-economic conditions, changing family structures and limited access to specialized maternal mental health services. The setting was relevant to the study because postpartum women in such communities may experience both the pressures of urban transition and the persistence of socio-cultural expectations related to marriage, motherhood, family support and child gender preference. The selection of this site therefore allowed the study to explore PPD within a specific local context rather than treating postpartum mental health as a uniform clinical condition detached from social environment.

Sampling Procedure and Sample Size

A purposive sampling technique was used to recruit eligible postpartum women from the study area. Participants were selected based on their relevance to the research objectives and their fulfilment of the inclusion criteria. The pilot phase included 30 postpartum women, representing approximately 10 percent of the proposed sample size for a future larger study of 300 participants. This sample size was considered suitable for preliminary exploration, testing of instruments, assessment of recruitment procedures and identification of potential associations requiring further investigation.

The inclusion criteria were: women aged 19–40 years; women who had delivered a child within the previous six months; and women residing in the study area during the period of data collection. The exclusion criteria were: women who were unwilling to participate; women unable to provide informed consent; and women who were unable to complete the interview process. Participation was voluntary, and no participant was included without informed consent.

Data Collection Procedure

Data were collected through face-to-face interviews conducted in a private and confidential setting. Eligible women were first informed about the purpose of the study, the voluntary nature of participation, the approximate time required and their right to withdraw at any stage without consequence. After consent was obtained, participants completed the Edinburgh Postnatal Depression Scale (EPDS), followed by a structured

questionnaire on socio-demographic, obstetric, psychosocial and cultural factors.

The pilot phase also served to assess the feasibility of field procedures, including participant recruitment, comprehension of questions, comfort with sensitive topics, duration of interviews and the practical suitability of the instruments in the local community context. Clarification was provided where necessary to ensure that participants understood the questions, but care was taken not to influence their responses.

Instruments

Postpartum depressive symptoms were assessed using the Edinburgh Postnatal Depression Scale (EPDS), a widely used screening instrument developed to identify depressive symptoms among postpartum women (Cox, Holden, and Sagovsky 1987). The EPDS consists of 10 self-reported items scored on a four-point Likert scale from 0 to 3, producing a total score ranging from 0 to 30. Higher scores indicate greater severity of depressive symptoms. In this study, an EPDS score of 12 or above was used as the cut-off point to identify women at risk of PPD.

The EPDS was used as a screening tool, not as a clinical diagnostic instrument. Therefore, participants scoring above the cut-off were interpreted as being at risk of postpartum depression rather than clinically diagnosed with PPD. The questionnaire was administered in a language understandable to participants, and explanations were provided when required to support accurate responses.

A structured and pretested questionnaire developed by the researcher was used to collect information on possible associated factors. The questionnaire was prepared based on relevant literature and previously reported determinants of PPD. It covered the following domains:

- 1) Socio-demographic characteristics, including maternal age, educational status, occupation, financial dependence and family structure;
- 2) Obstetric and reproductive history, including number of children, gender of children, planned or unplanned pregnancy, wanted or unwanted pregnancy, mode of delivery, pregnancy-related complications and expectations regarding the child's gender;
- 3) Psychiatric history, including personal history of mental illness, family history of psychiatric illness and previous mental health treatment; and

- 4) Psychosocial and family support factors, including quality of relationship with spouse, parents and in-laws, availability of emotional support, domestic conflict and experience of violence.

The questionnaire primarily generated quantitative data. Some participants also shared brief narrative comments during the interviews. These responses were recorded as contextual observations to support interpretation, but the study was not designed as a formal mixed-methods study, and no independent qualitative thematic analysis was conducted.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee before data collection. Participants were informed about the objectives of the study, the type of information being collected, the voluntary nature of participation, confidentiality protections and their right to withdraw at any point without penalty. Informed consent was obtained from all participants before participation.

To protect privacy, personal identifiers were not included in the dataset. Interviews were conducted in a private setting to reduce the risk of disclosure, particularly because the questionnaire included sensitive issues such as domestic conflict, family relationships, emotional distress and reproductive expectations. Data were handled confidentially and used only for research purposes. Since the EPDS is a screening tool and not a diagnostic instrument, women identified as being at risk of PPD were treated with sensitivity, and the need for appropriate referral or professional support was recognized as an ethical responsibility of the study.

Data Analysis

Data were analysed using descriptive and exploratory statistical methods suitable for a small pilot sample. Frequencies and percentages were calculated to describe participant characteristics and estimate the preliminary prevalence of women at risk of PPD based on the EPDS cut-off score.

Bivariate analysis was used to explore associations between PPD risk status and selected independent variables, including maternal age, financial dependence, family structure, psychiatric history, obstetric complications, domestic violence, gender preference, interpersonal relationships and family support systems. Given the small sample size, statistical results

were interpreted cautiously. Chi-square tests were used only where assumptions were reasonably met. Where expected cell counts were small, Fisher's exact test was considered more appropriate. A p-value of less than 0.05 was treated as statistically significant, but findings were interpreted as preliminary and hypothesis-generating rather than conclusive.

The analysis focused on identifying possible patterns that may require further testing in a larger study. No causal claims were made because the cross-sectional design captures exposure and outcome at one point in time and cannot determine temporal sequence.

Rigor and Trustworthiness

Several measures were used to strengthen the rigor of the pilot study. First, the EPDS was selected because it is a widely used and established screening instrument for postpartum depressive symptoms. Second, the structured questionnaire was pretested during the pilot phase to improve clarity, contextual relevance and participant comprehension. Third, interviews were conducted in a private setting to encourage honest responses and reduce social desirability bias. Fourth, the study clearly distinguished between screening for risk of PPD and clinical diagnosis, avoiding overinterpretation of EPDS results. Fifth, statistical findings were interpreted conservatively because of the small sample size.

The pilot design also enhanced methodological trustworthiness by identifying practical issues related to recruitment, question wording, participant comfort and the feasibility of collecting sensitive information in the study context. These lessons are important for refining procedures before implementing a larger community-based study.

Limitations

This study has several limitations. First, the sample size was small, which limits the statistical power of the analysis and prevents broad generalization. Second, purposive sampling may have introduced selection bias because participants were not randomly selected. Third, the cross-sectional design does not allow causal inference between risk factors and PPD. Fourth, the EPDS is a screening instrument and cannot replace clinical diagnosis by a mental health professional. Fifth, self-reported data may be affected by recall bias, stigma or reluctance to disclose sensitive experiences such as domestic conflict, lack of support or depressive

symptoms. Sixth, the study was conducted in a single urban locality in Prayagraj district, so the findings may not represent other urban, rural or regional settings in India.

Despite these limitations, the study is useful as a pilot investigation because it provides preliminary evidence, tests the feasibility of the research tools and identifies variables that may be important for future larger-scale research.

RESULTS

Prevalence of Postpartum Depression

The pilot study found that the prevalence of postpartum depression risk in Chak Dondi, Naini, Prayagraj, was 23.3% (Table 1). Seven of the thirty postpartum women screened positive for PPD based on the Edinburgh Postnatal Depression Scale (EPDS). Among these seven women, five had intermediate EPDS scores ranging from 12 to 21, while two had severe scores ranging from 22 to 30. The remaining twenty-three women scored below 12, indicating no major depressive symptoms based on the EPDS screening criteria.

Table 1 Prevalence of Postpartum Depression Among Study Participants

Postpartum depression	No. of individuals (n = 30)	Percentage (%)
Present	7	23.3
Absent	23	76.7

Source: The author(s)

A considerable proportion of respondents, nearly one in four women, screened positive for postpartum depression at varying levels of severity, although the majority did not show significant depressive symptoms (Table 2). When considered alongside previous studies, this pattern suggests that maternal mental health problems can affect women even in urban communities where basic healthcare services are available. The findings underscore the importance of routine PPD screening, particularly in urban settings where family structures and social support networks may differ from those in rural areas. They also highlight the need for early detection and timely maternal mental health care to reduce the negative effects of PPD on both maternal well-being and newborn development.

Table 2 Distribution of Participants Based on EPDS Scores Indicating Postpartum Depression

Postpartum depression	EPDS score	Number of individuals (n = 30)	Percentage (%)
Present	22–30	2	6.7
Present	12–21	5	16.6
Absent	<12	23	76.7

Source: The author(s)

Sociodemographic Risk Factors

Several key findings emerged from the analysis of the relationship between postpartum depression and sociodemographic factors among the study participants. Maternal age was significantly associated with postpartum depressive symptoms. Mothers aged 30 years or younger showed a higher prevalence of PPD risk (25%) than those aged above 30 years (16.7%). This difference was statistically significant ($\chi^2 = 4.02$, $p < 0.05$). This finding is consistent with previous research suggesting that younger postpartum women may be more vulnerable to PPD because they often have fewer coping strategies and face greater adjustment challenges during the transition to motherhood (Gupta et al. 2013).

Maternal educational attainment was also significantly associated with depression ($\chi^2 = 5.02$, $p < 0.05$). Depressive symptoms were found among 21% of women with lower levels of education, ranging from illiterate to intermediate, while a slightly higher proportion, 25%, was observed among women with higher education levels, from graduate to postgraduate. This suggests that higher education alone does not necessarily protect women from postpartum psychological distress. Other interrelated factors, such as work-related stress, family expectations, social pressure and role conflict, may also influence maternal mental health.

Maternal occupation showed a significant association with PPD ($\chi^2 = 5.84$, $p < 0.05$). Unemployed women reported more depressive symptoms (27.3%) than employed women (11.1%). This finding suggests that employment may function as a protective factor, possibly by increasing social interaction, strengthening financial autonomy and providing women with a sense of identity beyond domestic and caregiving roles.

Religious identity did not show a statistically significant association with depression. Depressive symptoms were reported by 20.8% of Hindu

women and 28.6% of Muslim or other women. Similarly, no significant association was found between PPD and husbands' education or occupation. However, a slightly higher prevalence of depressive symptoms was observed among women whose husbands had lower educational attainment (30%) and among women whose husbands were engaged in self-employment or private employment (26.3%). This pattern suggests that socioeconomic pressures may indirectly affect maternal mental health, even when the association is not statistically significant.

Family structure emerged as a significant sociodemographic factor. Women living in nuclear families showed a higher prevalence of depressive symptoms (33.3%) than those living in joint families (16.7%), and this association was statistically significant ($\chi^2 = 4.11$, $p < 0.05$). This finding suggests that the presence of extended family members may provide practical assistance, emotional support and shared caregiving responsibilities, which can help reduce postpartum psychological distress (Qi et al. 2022).

The mother's financial contribution to the household was also significantly associated with depression ($\chi^2 = 5.84$, $p < 0.05$). Depressive symptoms were reported by 11.1% of women who contributed financially to the household, compared with 28.6% of women who did not. This finding suggests that financial contribution and economic autonomy may strengthen women's self-perception, sense of agency and psychological well-being. It is also consistent with earlier studies indicating that financial independence and improved self-esteem are positively linked to maternal mental health (Belle and Doucet 2003; Goyal, Gay, and Lee 2010).

Overall, these findings emphasize the multidimensional nature of postpartum depression. Sociodemographic factors such as age, education, occupation, family structure and financial contribution do not operate in isolation; rather, they interact with psychological, cultural and household-level conditions. Identifying these factors is important for recognizing women at higher risk of PPD and for designing context-sensitive interventions that reduce vulnerability among postpartum women.

As shown in Table 3, the exploratory findings suggest that certain sociodemographic characteristics may be associated with postpartum depressive symptoms among the participants. Higher proportions of depressive symptoms were observed among younger mothers aged 30 years or below, unemployed women, women who did not contribute financially to the household and women living in nuclear families. These patterns may indicate the possible influence of financial dependence, limited social

support and increased caregiving responsibilities on maternal mental health during the postpartum period. Maternal educational status also varied across groups, although the small sample size limits the strength of interpretation.

In contrast, religion, husbands' educational level and husbands' occupation did not show meaningful differences within this pilot sample. Because the study included only 30 purposively selected participants, the statistical findings should be interpreted as preliminary and hypothesis-generating rather than as conclusive evidence of association. In several categories, subgroup frequencies were small, which may affect the reliability of chi-square testing. Therefore, larger studies with more representative samples and stronger statistical power are needed to validate these observed trends.

Table 3 Association between Sociodemographic Variables and Postpartum Depression

Sociodemographic variable	Categories	Depression Yes (n = 7)	Depression No (n = 23)	χ^2	p-value
Age	≤30 years >30 years	5 (25%) 2 (16.7%)	15 (75%) 10 (83.3%)	$\chi^2 = 4.02$	0.045
Mother's education	Illiterate– Intermediate Graduate– Postgraduate	4 (21%) 3 (25%)	15 (79%) 9 (75%)	$\chi^2 = 5.02$	0.025*
Mother's occupation	Employed Unemployed	1 (11.1%) 6 (27.3%)	8 (88.9%) 16 (72.7%)	$\chi^2 = 5.84$	0.016*
Religion	Hindu Muslim/Others	5 (20.8%) 2 (28.6%)	19 (79.2%) 5 (71.4%)	$\chi^2 = 0.19$	0.663
Husband's education	Up to high school Intermediate and above	3 (30%) 4 (18.2%)	7 (70%) 18 (81.8%)	$\chi^2 = 0.53$	0.467
Husband's occupation	Self/private Government	5 (26.3%) 2 (16.7%)	14 (73.7%) 10 (83.3%)	$\chi^2 = 0.40$	0.527
Type of family	Nuclear (<4 members) Joint (≥4 members)	4 (33.3%) 3 (16.7%)	8 (66.7%) 15 (83.3%)	$\chi^2 = 4.11$	0.043*
Financial contribution to household	Yes No	1 (11.1%) 6 (28.6%)	8 (88.9%) 15 (71.4%)	$\chi^2 = 5.84$	0.016*

Source: The author(s)

Figure 1 illustrates the relative frequency of postpartum depressive symptoms across selected socio-demographic categories among the study participants. The primary Y-axis on the left shows the percentage of women in each subgroup who screened positive for postpartum depression, while the secondary Y-axis on the right shows the cumulative percentage.

The highest proportion of depressive symptoms was observed among women living in nuclear families (33.3%), followed by women who did not contribute financially to the household (28.6%), unemployed women (27.3%), mothers aged 30 years or below (25%) and women with intermediate-level education (25%). Depressive symptoms were also reported among illiterate women (21%). Lower proportions were observed among mothers aged above 30 years (16.7%), women living in joint families (16.7%), employed women (11.1%) and women who contributed financially to the household (11.1%).

Overall, the figure suggests that postpartum depressive symptoms were more common among women with limited financial autonomy, unemployment and nuclear family arrangements. These patterns indicate that socio-economic vulnerability and reduced household support may be important factors shaping maternal mental health during the postpartum period. However, because the study is based on a small pilot sample, the findings should be interpreted as descriptive and exploratory rather than as conclusive evidence of association.

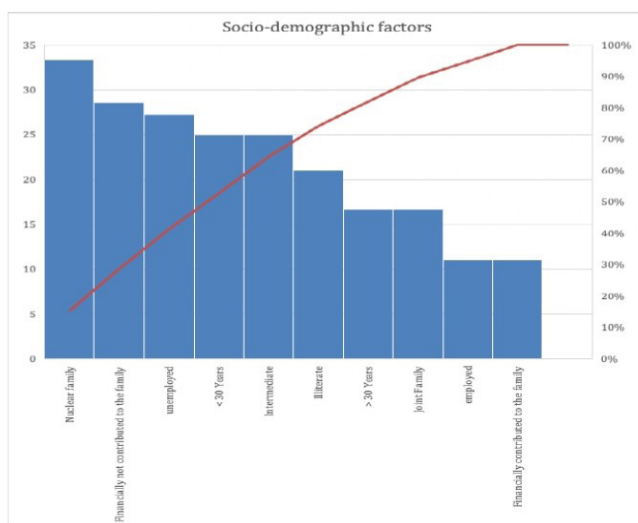


Figure 1 Socio-Demographic Distribution of Postpartum Depression Risk among Study Participants

Source: The author(s)

Obstetric Factors and Gender Related Risk factors

Table 4 shows that there was a substantial relationship between many obstetric variables, gender-related difficulties and the occurrence of postpartum depression (PPD). Women with two or more daughters had a higher prevalence of PPD (40%) than those with one or no daughters (20.8%) ($\chi^2 = 3.74$, $p < 0.05$), reflecting the ongoing socio-cultural preference for male children and the associated psychological stress on mothers, as extensively reported in South Asian cultural literature (Patel, Rodrigues, and DeSouza 2002).

Postpartum depression was found to be statistically significantly associated with pregnancy desirability categorized as unwanted, wanted but unplanned and wanted and planned ($\chi^2 = 7.21$, $p < 0.05$). Women with unwanted pregnancies had the highest frequency of PPD (50%), followed by those with wanted but unplanned pregnancies (25%), while women with both wanted and planned pregnancies had the lowest prevalence (11.1%). This gradient implies that postpartum mental health outcomes are significantly influenced by psychological preparedness and emotional acceptance of pregnancy.

Furthermore, PPD was strongly associated with pressure to have a male child ($\chi^2 = 5.98$, $p < 0.05$), with a 50% prevalence among women who gave birth to daughters under such pressure, compared to 28.6% among those who gave birth to sons and 16.7% among those who did not report any such pressure. The risk condition of PPD was further aggravated by a disparity between the gender preference of the child and the actual birth outcome ($\chi^2 = 4.71$, $p < 0.05$). Only 15% of women whose desires were fulfilled developed PPD, compared to 36.4% of women who wanted a son but delivered daughter instead. Few studies have supported evidence of the pervasive gender bias in some communities, which causes emotional discomfort for new mothers (Patel, Rodrigues, and DeSouza 2002; Walby 1990).

Furthermore, there was a significant correlation between greater incidence of PPD and medical difficulties during both pregnancy and delivery ($\chi^2 = 5.31$ and 6.12 , $p < 0.05$, respectively). Minor prevalence was found among women without complications while it was 42.9% in those with pregnancy-related problems and 50% in those with delivery complications. These findings are consistent with previous research that highlights obstetric difficulties as significant clinical predictors of postpartum depression (Ghaedrahmati et al. 2017; Priya et al. 2024).

The exploratory analysis suggested several possible relationships between obstetric, reproductive and gender-related factors and postpartum depressive symptoms among participants. Higher proportions of depressive symptoms were observed among women reporting unwanted pregnancies, pregnancy or delivery-related complications and perceived pressure regarding the birth of a male child. Women who desired a male child but delivered a daughter also appeared to report depressive symptoms more frequently than those who did not report such expectations. Although chi-square analysis indicated statistically notable patterns for some variables, these findings should be interpreted with caution due to the small purposive pilot sample and the limited cell frequencies in several categories. The results are therefore best understood as preliminary trends rather than stable population-level associations. Larger studies using probability-based sampling and more robust statistical testing are required to confirm these observed relationships.

Table 4 Association of Obstetric Factors and Gender Issues with Postpartum Depression

Obstetric factors and gender issues	Depression Yes (n = 7)	Depression No (n = 23)	χ^2	p-value
Total number of girls: ≤ 1	5 (20.8%)	19 (79.2%)	$\chi^2 = 3.74$	0.053
Total number of girls: > 1	2 (40%)	3 (60%)	$\chi^2 = 3.74$	0.053
Present pregnancy: Wanted and planned	2 (11.1%)	16 (88.9%)	$\chi^2 = 7.21$	0.027*
Present pregnancy: Wanted but unplanned	2 (25%)	6 (75%)	$\chi^2 = 7.21$	0.027*
Present pregnancy: Unwanted	3 (75%)	1 (25%)	$\chi^2 = 7.21$	0.027*
Pressure to have a male child: Delivered son	2 (28.6%)	5 (71.4%)	$\chi^2 = 5.98$	0.050
Pressure to have a male child: Delivered daughter	2 (50%)	2 (50%)	$\chi^2 = 5.98$	0.050
Pressure to have a male child: No pressure	3 (16.7%)	15 (83.3%)	$\chi^2 = 5.98$	0.050
Wanted son but delivered daughter: Yes	4 (36.4%)	7 (63.6%)	$\chi^2 = 4.71$	0.030*
Wanted son but delivered daughter: No	3 (15%)	16 (85%)	$\chi^2 = 4.71$	0.030*
Complication during pregnancy: Yes	3 (42.9%)	4 (57.1%)	$\chi^2 = 5.31$	0.021*

Table 4 (Continued)

Obstetric factors and gender issues	Depression Yes (n = 7)	Depression No (n = 23)	χ^2	p-value
Complication during pregnancy: No	4 (17.4%)	19 (82.6%)	$\chi^2 = 5.31$	0.021*
Complication during delivery: Yes	4 (50%)	4 (50%)	$\chi^2 = 6.12$	0.013*
Complication during delivery: No	3 (13.6%)	19 (86.4%)	$\chi^2 = 6.12$	0.013*

Source: The author(s)

Figure 2 illustrates the distribution of obstetric factors associated with postpartum depression among the study participants. The most frequently reported adverse obstetric conditions included unwanted pregnancy (n = 75), pressure to have a male child but delivering a daughter (n = 50), and complications during delivery (n = 50). Other commonly reported conditions were complications during pregnancy (n = 43), having more than one girl child (n = 40), and wanting a son but delivering a daughter (n = 37). Together, these factors accounted for over 75% of the cumulative distribution, highlighting their dominant role in influencing postpartum depression risk. Conversely, protective conditions such as planned and wanted pregnancy (n = 11), no complications during pregnancy (n = 17), and absence of pressure for a male child (n = 18) were less frequently associated with depressive symptoms.

These findings emphasize the significance of pregnancy planning, maternal autonomy, and the absence of gender-based pressures in safeguarding maternal mental health. From a public health perspective, addressing socio-cultural pressures related to child gender, ensuring safe obstetric care, and promoting reproductive choice may be vital strategies in reducing the burden of postpartum depression.

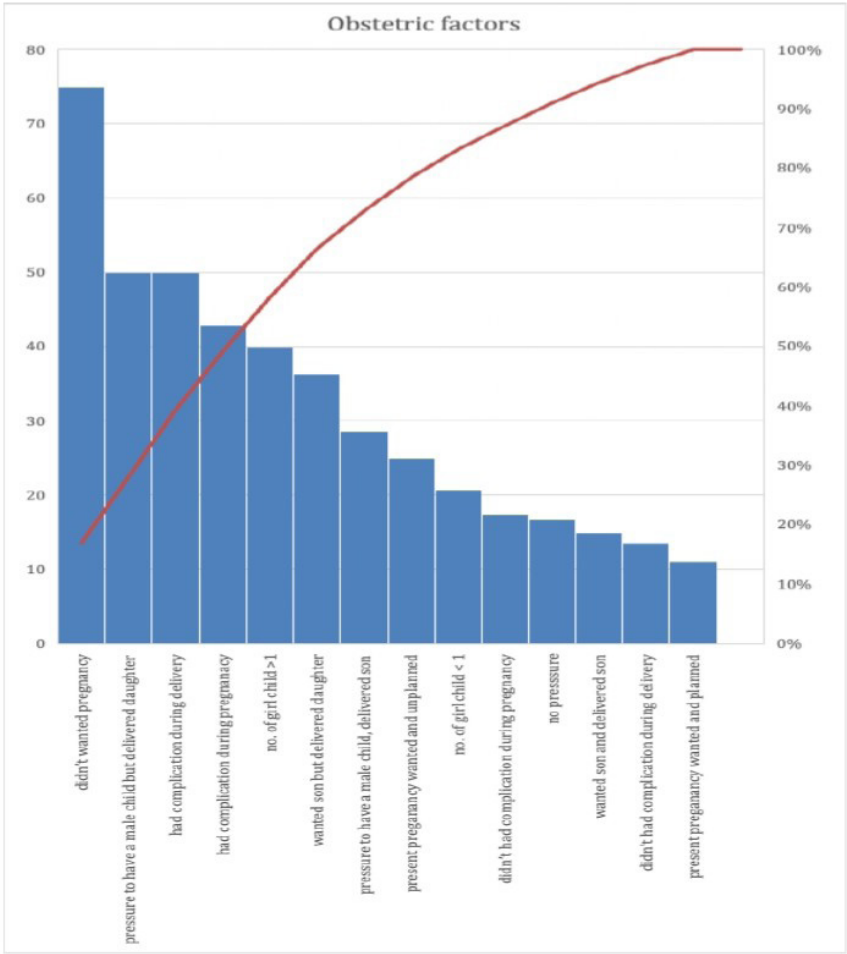


Figure 2 Obstetric Factors Associated with Postpartum Depression Risk among Study Participants
Source: The author(s)

Correlation with Adverse Life Events, Previous Psychiatric History and Family Relationship

Table 5 shows that a substantial correlation was found between the prevalence of postpartum depression (PPD) in the study population and a number of negative life experiences, psychiatric history and family relationship attributes. With 50% of women who experienced domestic violence reported PPD, compared to 19.2% of those who did not ($\chi^2 =$

4.61, $p < 0.05$), domestic violence emerged as a significant risk factor, highlighting the significant psychological impact of interpersonal trauma during the postpartum period.

Table 5 Association Psychosocial Factors with Postpartum Depression

Psychosocial factors	Depression Yes (n = 7)	Depression No (n = 23)	χ^2	p-value
Personal history of previous psychiatric complaints: Yes	2 (40%)	3 (60%)	$\chi^2 = 4.73$	0.0296
Personal history of previous psychiatric complaints: No	5 (20.8%)	19 (79.2%)	$\chi^2 = 4.73$	0.0296
Closely attached to the partner: No	5 (41.7%)	7 (58.3%)	$\chi^2 = 7.13$	0.0076
Closely attached to the partner: Yes	2 (11.1%)	16 (88.9%)	$\chi^2 = 7.13$	0.0076
Husband taking alcohol or psychotropic drugs: Yes	3 (37.5%)	5 (62.5%)	$\chi^2 = 5.44$	0.0194
Husband taking alcohol or psychotropic drugs: No	4 (18.2%)	18 (81.8%)	$\chi^2 = 5.44$	0.0194
Adequate relationship with the parents: No	5 (41.7%)	7 (58.3%)	$\chi^2 = 6.23$	0.0126
Adequate relationship with the parents: Yes	2 (11.1%)	16 (88.9%)	$\chi^2 = 6.23$	0.0126
Adequate relationship with the in-laws: No	4 (33.3%)	8 (66.7%)	$\chi^2 = 4.98$	0.0256
Adequate relationship with the in-laws: Yes	3 (15.8%)	16 (84.2%)	$\chi^2 = 4.98$	0.0256
Support from in-laws during pregnancy: Inadequate	5 (38.5%)	8 (61.5%)	$\chi^2 = 5.72$	0.0168
Support from in-laws during pregnancy: Adequate	2 (11.1%)	15 (88.9%)	$\chi^2 = 5.72$	0.0168

Source: The author(s)

The presence of a family history of psychiatric disorders demonstrated a statistically significant association with postpartum depression ($\chi^2 = 4.73$, $p < 0.05$), as 40% of affected women were reported to have PPD, in contrast to 20.8%. A personal history of psychiatric illness was a substantial predictor ($\chi^2 = 6.08$, $p < 0.05$), with PPD present in 50% of those women compared to 19.2% of those without prior psychiatric morbidity. These findings corroborate with previous study that has shown personal and familial mental health vulnerabilities as key contributors to PPD (Bauer et al. 2018).

Another risk factor affecting PPD was the state of family and marital relationships. The prevalence of PPD was significantly greater among women who reported feeling lower spousal emotional closeness (41.7%) than among those who reported feeling close to their husband (11.1%) ($\chi^2 = 7.13$, $p < 0.05$). This result supports other studies showing that improved postpartum depression adjustment is substantially correlated with emotional intimacy and spouse support (Qi et al. 2022). Furthermore, the husband's use of alcohol or psychotropic substances was linked to a higher prevalence of PPD (37.5% vs. 18.2%) ($\chi^2 = 5.44$, $p < 0.05$), which is probably due to the undermining influence of drug misuse on the emotional health of mothers and the harmony of the home.

The perceived quality of relationships with parents and in-laws also played a pivotal role. Women who reported unsatisfactory relationship with their parents had a PPD prevalence of 41.7%, compared to 11.1% who perceived their parental relationships as adequate ($\chi^2 = 6.23$, $p < 0.05$). Inadequate in-law relationships were associated with a greater prevalence of PPD (33.3%) compared to those with adequate ties (15.8%) ($\chi^2 = 4.98$, $p < 0.05$).

Furthermore, there was a high correlation between PPD and the perceived lack of support from in-laws during pregnancy ($\chi^2 = 5.72$, $p < 0.05$). The prevalence of PPD was 38.5% among those who reported inadequate support, whereas it was 11.1% among those who felt well supported. These results corroborate with the study highlighting how social ecology and support networks, especially family dynamics and the existence of emotional safety and instrumental care, have a substantial impact on postpartum mental health (Qi et al. 2022).

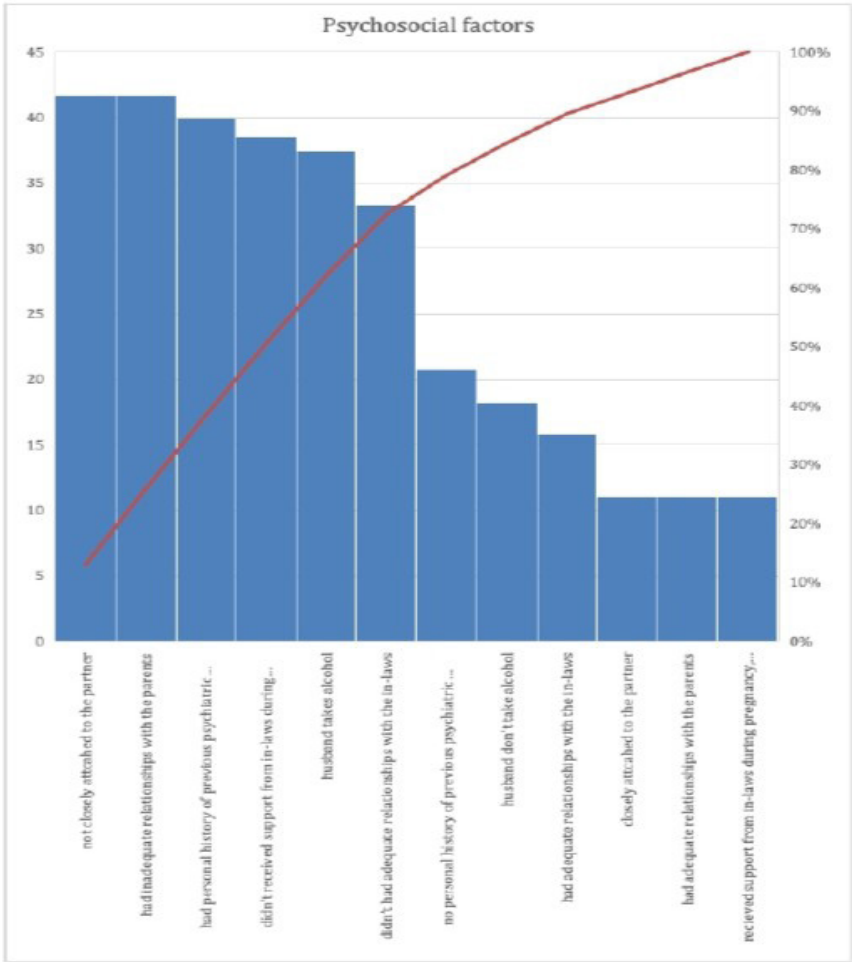


Figure 3. Psychosocial Factors Associated with Postpartum Depression Risk among Study Participants

Source: The author(s)

Figure 3 presents the distribution of psychosocial determinants associated with postpartum depression among the study participants. The most frequently reported adverse psychosocial conditions included lack of emotional closeness with the partner (n = 42), inadequate relationships with parents (n = 42), and a history of psychiatric illness (n = 41). Additionally, inadequate support from in-laws during pregnancy (n = 39) and having a

husband who consumes alcohol or psychotropic substances ($n = 38$) were also commonly observed. These factors together accounted for over 75% of the cumulative distribution, indicating their predominant presence in the study population. Conversely, protective factors such as absence of alcohol use, adequate relationships with in-laws, and emotional closeness with the partner were less frequently associated with depressive symptoms.

These findings underscore the critical role of family dynamics, substance use, and pre-existing psychiatric vulnerability in influencing postpartum mental health outcomes. From a public health perspective, these results suggest that targeted psychosocial interventions, particularly those aimed at improving familial relationships, addressing substance use in spouses, and providing psychosocial support during pregnancy, may be instrumental in reducing the burden of postpartum depression.

DISCUSSION

This exploratory pilot study suggests that postpartum depression risk is an important maternal mental health concern among postpartum women in Chak Dondi, Naini, Prayagraj. The observed prevalence of 23.3% indicates that nearly one in four participants screened positive for postpartum depressive symptoms based on the EPDS cut-off. This finding is broadly comparable with previous Indian studies reporting postpartum depression rates between approximately 15% and 25% (Gupta et al. 2013; Upadhyay et al. 2017; Aslam et al. 2022). However, because this study used a small purposive pilot sample, the findings should be interpreted as preliminary and hypothesis-generating rather than as definitive population-level estimates.

The results indicate that postpartum depressive symptoms were not distributed randomly across the sample. Higher levels of PPD risk were observed among younger mothers, unemployed women, women who did not contribute financially to the household, women living in nuclear families and women exposed to psychosocial stressors such as inadequate emotional support, strained family relationships, domestic conflict and pressure related to child gender. These patterns suggest that postpartum mental health is shaped not only by individual or biomedical factors, but also by social, familial, economic and cultural conditions.

These findings are consistent with existing literature showing that postpartum depression is associated with low social support, financial stress, obstetric complications, domestic violence, poor partner support and previous psychiatric vulnerability (Ghaedrahmati et al. 2017; Upadhyay

et al. 2017). The present study adds local relevance to this literature by showing how these risk factors may operate in an urban North Indian setting where maternal health is embedded within household structures, kinship expectations and gendered norms surrounding motherhood. In such settings, women's psychological well-being may be affected by their degree of financial autonomy, the availability of caregiving support and the emotional quality of relationships with spouses, parents and in-laws.

One of the most important findings concerns the possible relationship between son preference and postpartum depressive symptoms. In many South Asian contexts, motherhood is closely connected to expectations about family continuity, lineage and the birth of male children. When reproductive outcomes do not align with these expectations, women may experience emotional stress, blame, disappointment or diminished status within the family (Patel, Rodrigues, and DeSouza 2002). The findings of this pilot study tentatively support this argument by suggesting that pressure to bear a male child and dissatisfaction surrounding the birth of daughters may contribute to postpartum psychological distress. This indicates that PPD should not be understood only as an individual mental health condition, but also as a possible reflection of gendered inequality and reproductive pressure (Walby 1990).

Family structure also emerged as an important factor. Women living in nuclear families showed higher levels of depressive symptoms than those living in joint families. This finding may be interpreted in relation to the changing organization of care in urban India. Urbanization, migration and the decline of extended household arrangements may reduce the availability of practical and emotional support for postpartum women. Although joint families can also reproduce patriarchal expectations and surveillance, they may provide assistance with childcare, domestic work and postpartum recovery. In contrast, women in nuclear families may face greater caregiving burdens, emotional isolation and reduced support, especially when they are financially dependent or have limited access to outside help (Das 2007; Qi et al. 2022).

Psychosocial factors further strengthen this interpretation. Strained marital relationships, inadequate support from parents or in-laws, husbands' alcohol or substance use and previous psychiatric history were prominent among women who screened positive for depressive symptoms. These findings align with feminist and sociological perspectives that link women's mental distress to unequal household power relations, emotional labour and insufficient recognition of women's care work (Belle and Doucet 2003; Chodorow 1978). From this perspective, postpartum depression is not only

a clinical issue but also a social condition shaped by the organization of family life, gender roles and access to emotional support.

The theoretical contribution of this study lies in its socio-ecological and gender-sensitive reading of postpartum depression. Rather than treating PPD as a purely biomedical disorder, the study situates maternal mental health within layered social contexts: individual vulnerability, obstetric experience, household relations, economic dependence, gender expectations and health-system limitations. This approach helps explain why women in the same postpartum period may experience different levels of psychological distress depending on their family environment, social support and cultural positioning. The findings therefore contribute to maternal health research, gender studies and the sociology of family and care by showing how postpartum depression may be produced through the interaction of health, kinship and patriarchy.

Although the study primarily used quantitative data, limited narrative responses from participants provided useful contextual insight. Some women described dependence on mothers or mothers-in-law for childcare and emotional support, showing the continued importance of kinship-based caregiving in urban Indian communities. Others reported loneliness, emotional neglect and difficulty communicating their mental health needs. Several responses also suggested that healthcare interactions focused mainly on physical recovery and infant care, while maternal emotional well-being received limited attention. These observations were not analysed through a formal qualitative method, but they helped contextualize the statistical patterns and illustrated how support systems, or the absence of such systems, may shape postpartum experiences.

The findings have important practical and policy implications. First, routine screening for postpartum depression should be better integrated into antenatal and postnatal care, particularly in primary and community health settings. Second, screening should not focus only on symptoms but should also assess family support, domestic conflict, financial dependence, reproductive pressure and partner behaviour. Third, maternal mental health interventions should include family counselling and community awareness initiatives so that spouses, in-laws and other family members understand the emotional needs of postpartum women. Fourth, women who screen positive for PPD risk should have access to referral pathways for counselling, psychosocial support and, where necessary, specialist mental health care. Finally, public health programmes should address stigma and normalize discussion of postpartum emotional distress as part of maternal health.

At the same time, the limitations of the study must be clearly acknowledged. The sample size was small, and the use of purposive sampling limits the generalizability of the findings. The study was conducted in a single urban locality, so the results may not represent all postpartum women in Prayagraj, Uttar Pradesh or urban India more broadly. The cross-sectional design also prevents causal interpretation, as the study cannot establish whether the identified risk factors preceded or resulted from depressive symptoms. In addition, the EPDS is a screening tool rather than a clinical diagnostic instrument. Self-reported responses may also have been influenced by stigma, recall bias or reluctance to disclose sensitive issues such as domestic conflict, poor family support or emotional distress.

Despite these limitations, the study has broader significance. It shows that postpartum depression risk can persist even in urban settings where basic healthcare services may be available. The findings suggest that access to healthcare alone is insufficient if maternal mental health is not systematically screened, socially recognized and supported within the family and community. By highlighting the links between PPD, family structure, financial dependence, psychosocial stress and gendered expectations, this pilot study provides a foundation for larger studies in urban North India. Future research should use larger and more representative samples, longitudinal designs and systematically planned mixed-methods approaches to examine how social structures, cultural norms and healthcare systems interact to shape postpartum mental health.

CONCLUSION

This pilot study shows that postpartum depression risk is present among urban postpartum women in Prayagraj, with 23.3% of participants screening positive on the EPDS. The findings suggest that PPD is associated with a combination of socio-demographic, obstetric, psychosocial and cultural factors, including younger maternal age, unemployment, financial dependence, nuclear family structure, unplanned or unwanted pregnancy, obstetric complications, son preference, domestic violence, previous psychiatric history and strained marital or family relationships. At the same time, emotional support from spouses and family members appeared to function as a protective factor. Taken together, these findings indicate that PPD should not be understood only as an individual clinical condition, but as a maternal mental health problem shaped by household relations, economic vulnerability, reproductive pressure and gendered expectations.

The study contributes preliminary evidence from an under-researched urban North Indian context and highlights the need to integrate routine mental health screening, counselling and referral into maternal healthcare services. It also suggests that interventions should involve not only postpartum women but also spouses, in-laws, family caregivers and community health workers, because family support and household dynamics strongly influence maternal well-being. However, the findings must be interpreted cautiously because the study used a small purposive pilot sample, was limited to one urban locality and relied on EPDS screening rather than clinical diagnosis. Future research should use larger and more representative samples, longitudinal designs and mixed-methods approaches to examine how socio-cultural norms, family structure and healthcare access interact to shape postpartum depression in urban and rural settings across North India.

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