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Original Research Article

Prevalence of postpartum depression and its associated risk factors: a cross-sectional study among Goan urban population, India

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ABSTRACT

Background: Postpartum depression (PPD) is a common and serious mental health issue affecting women after childbirth. It manifests as low mood, decreased energy, and loss of interest in daily activities, significantly impacting the quality of life of mothers and their families. Understanding the prevalence and risk factors of PPD is crucial for developing targeted interventions, especially in populations where cultural, social, and economic conditions may influence mental health outcomes. Objectives were to estimate the prevalence of PPD in urban Goan women and identify the primary risk factors associated with PPD in this population.
Methods: This cross-sectional study was conducted among postpartum women residing in urban areas of Goa. The participants were screened for PPD using EDPS standardized assessment tools. Sociodemographic, obstetric, and psychosocial variables were collected to examine potential risk factors associated with PPD. Data analyzed using SPSS and p value less than 0.05 taken as statistically significant.
Results: The prevalence of PPD in the study sample was found to be 17.8%. Key risk factors identified included lack of social support, previous mental health history, socioeconomic challenges, and relationship difficulties. The study highlighted the significant influence of socio-economic and emotional support structures on the mental health of postpartum women.
Conclusions: The findings underscore the need for targeted screening and intervention strategies for postpartum women, particularly in settings with similar cultural and socio-economic contexts. Healthcare providers should prioritize early identification and management of PPD to improve maternal mental health and overall well-being.

Keywords: PPD, Prevalence, Risk factors, Urban population, Goa, Maternal mental health

INTRODUCTION

Postpartum depression (PPD) is a term applied to describe depressive symptoms occurring after delivery and is characterized by low mood, loss of enjoyment, reduced energy, and activity, marked functional impairment, reduced self-esteem, ideas or acts of self-harm, or suicide.[1] The women's transition into motherhood is a difficult period that involves significant changes in the psychological, social, and physiological aspects and is considered to increase vulnerability to the development of mental illness.[2] PPD has become a serious public health concern among women in the developing world and is predicted to become the most common cause of disability by the year 2020 associated with increased mortality through suicide also; it contributes to other associated diseases. PPD usually occurs 6 to 8 weeks after childbirth, which may lead to a decrease in an individual's daily performance.[1] Earlier studies reported that, when mothers are faced with discomfort due to physical changes, poor sleeping quality, and various uncertainties related to their newborns in the postpartum stage, also it will lead to problems in mother-child interactions.[1,4] Depression has significant negative effects on a mother's ability to interact

appropriately with her child.[5] Depressed women have been found to have poorer responsiveness to infant cues and more negative, hostile, or disengaged parenting behavior.[6,7]

Postpartum psychiatric disorders can be divided into three categories: postpartum blues; postpartum psychosis and PPD. Postpartum blues, with an incidence of 300-750 per 1000 mothers globally, may resolve in a few days to a week, has few negative sequelae and usually requires only reassurance. Postpartum psychosis, which has a global prevalence ranging from 0.89 to 2.6 per 1000 births, is a severe disorder that begins within four weeks postpartum and requires hospitalization.[1,4] PPD can start soon after childbirth or as a continuation of antenatal depression and needs to be treated. The global prevalence of PPD has been estimated as 100-150 per 1000 births. In India, it is estimated that about 22% of mothers suffer from PPD.[4] Despite its prevalence, PPD remains undiagnosed in over 50% of cases due to the stigma surrounding the condition and patients' reluctance to disclose symptoms.

Significant risk factors for PPD include a history of depression before or during pregnancy, anxiety during pregnancy, experiencing stressful life events during pregnancy or the early puerperium, low levels of social support or partner support, low socioeconomic status (SES), and obstetric complications. The intersection of cultural, interpersonal, and socioeconomic factors may also confer a significant risk of PPD: in one study in Goa, India, the risk for depression after delivery increased with economic deprivation, marital violence, and the female gender of the infant.[8]

Significance of the study

Despite the launch of India's national mental health programme in 1982, maternal mental health is still not a prominent component. India is experiencing a steady decline in maternal mortality which means that the focus of care in the future will shift towards reducing maternal morbidity, including mental health disorders.

Our current understanding of the epidemiology of PPD in the state of Goa is lacking. So, the present study has been conducted to estimate the burden and its associated risk factors in Goa and to provide evidence-based data for prioritizing maternal mental health care in the state.

Aim and objectives

Aim and objectives were to estimate the prevalence of PPD in urban Goa, identify associated risk factors related to PPD and provide evidence-based data for prioritization of maternal mental health care in our state.

METHODS

We conducted a community-based study among post-partum mothers in the urban area of Mapusa from November 2022- March 2023, postnatal women, aged 18 years and above registered with the Anganwadi and residing in the Mapusa municipal area, within six months after delivery included in this study. Informed consent was taken from all the participants. The inclusion criteria were, all deliveries irrespective of the mode and outcome in the mothers aged more than 18 years. We excluded all those unwilling to complete the questionnaire after informed consent. Ethical approval was taken from the institutional ethical committee before the commencement of the study.

The sample size was calculated using the equation

Sample size=$4pq/d^2$

Based on the 21.5% prevalence of PPD from another study conducted in Karnataka, the sample size calculated was 134, which rounded to 140. For the selection of eligible participants, a random sampling approach was used.

Data collection

The 140 postnatal women within six months of their deliveries were interviewed using a semi-structured questionnaire. Post-partum mothers were screened by using a validated questionnaire-EPDS (Edinburg PPD score). EPDS (attached along with the Performa) is 10 questionnaires with points up to 30. It is a screening test to identify women at risk of mental disorders who need to be evaluated and followed up. It is a well-established, easy-to-use, and validated scale used globally. Cox and Holden suggested a cutoff score of 13 or higher (sensitivity for identifying major depressive episode (MDE)=86%, specificity=78%, and positive predictive value=73%) for PPD screening in clinical settings.

Post-partum women were given a "language validated questionnaire" in our case, Konkani/Hindi/English language, so it was easily understood by them and scoring could be done. Women who had scores more than 13 which suggested that they were at risk of probable depression' were referred for psychiatry follow-up.

Statistical analysis

The data was entered in SPSS software (version 22.0). Descriptive analysis was done on socio-demographic variables, obstetric, neonatal and postnatal, and psychosocial factors. Logistic regression was carried out to analyze the factors associated with PPD. The demographic variables and the clinical variables were cross-tabulated with the EPDS score. The Chi-square test and Fisher Exact tests were used wherever appropriate and the $p<0.05$ was a significance test.

RESULTS

Among 140 study participants, 17.8% were detected to have PPD based on the EDPS depression scale, while 82.2% were found to be normal.

Table 1: Prevalence of PPD among study participants, (n=140).

PPD	N	Percentage (%)
Present	25	17.8
Absent	115	82.2

The analysis of demographic factors provided insights into the prevalence of PPD among different groups, though many factors did not show significant associations with PPD. Age, education, occupation, residence, and family type were analyzed but did not demonstrate a strong link to PPD. For instance, PPD rates were slightly higher among unemployed participants and those from urban areas, but these associations were not statistically significant (Table 2).

Two demographic factors, however, did show notable associations with PPD. SES was a significant factor, with higher PPD rates observed among participants below poverty line (p=0.05). Economic dependence also had strong association with PPD (p=0.0001).

Religion was included in the analysis, but there were no significant differences in PPD prevalence among Hindu, Christian, and Muslim participants. Similarly, family structure (nuclear vs. joint family) did not significantly impact the likelihood of PPD.

Psychosocial factors play a significant role in prevalence of PPD among study participants. Generalized stress/ anxiety notably linked to higher rates of PPD (p=0.01), suggesting that heightened stress levels are a crucial factor in postpartum mental health. Participants with family history of psychiatric illness also had a higher prevalence of PPD (p=0.003), indicating that genetic/familial predispositions may contribute to postpartum mental health challenges. Similarly, past psychiatric history associated with increased PPD rates (p=0.01).

Lack of social support, particularly from husbands or in-laws, was another strong predictor of PPD (p=0.001), underscoring the importance of familial and partner support in the postpartum period. Additionally, unplanned pregnancies were strongly correlated with PPD (p=0.0001), suggesting that unexpected pregnancies may contribute to mental health stressors during the postpartum phase. Experiences of domestic violence (p=0.03) and marital disharmony (p=0.01) were also significant factors, highlighting how relationship conflicts and abusive environments can exacerbate vulnerability to PPD.

The analysis of obstetric factors revealed several significant associations with PPD. Participants who experienced complications during pregnancy showed a notably higher prevalence of PPD (p=0.005), highlighting that health challenges during pregnancy can increase the risk of mental health issues post-delivery. A history of abortion was also significantly associated with PPD (p=0.01), indicating that past pregnancy losses may contribute to postpartum emotional distress.

Feeding difficulties during the initial postpartum month were another significant factor, with participants experiencing these issues showing a higher rate of PPD (p=0.019). This suggests that early challenges in establishing breastfeeding or other feeding routines can contribute to postpartum mental health struggles, potentially due to stress and anxiety related to infant care.

Although other obstetric factors, such as mode of delivery (C-section, normal vaginal/ assisted delivery) and postpartum duration were examined, they didn't show significant associations with PPD in study. Additionally, there was no strong link between PPD and having history of epidural anesthesia/ antepartum complications.

Table 2: PPD based on the demographic profile of the study participants, (n=280).

Parameters		Total participants	Depressed-EDPS score 13 and above	Not depressed	P value
Age (in years)	>25	85	16	69	0.88
	<25	55	9	46	
Education	Uneducated	25	2	23	0.26
	Educated	115	23	92	
Occupation	Unemployed	56	10	46	1.0
	Employed	84	15	69	
Residence	Rural	16	4	12	0.81
	Urban	94	21	73	
Religion	Hindu	76	14	62	0.41
	Christian	40	5	35	
	Muslim	24	6	18	
Socio economic status	APL	32	2	30	0.05
	BPL	108	23	85	
Economic dependence	Independent	67	5	62	0.0001
	Partially dependent	42	7	35	
	Dependent	31	13	18	

Continued.

Parameters		Total participants	Depressed-EDPS score 13 and above	Not depressed	P value
Type of family	Nuclear	83	16	67	0.5
	Joint	57	9	48	

Table 3: Association of psycho-social factors and PPD, (n=140).

Psychosocial factors	Total participants	Depressed	Not depressed	P value
Any complaints of generalized stress/ anxiety?				
Yes	45	15	30	0.01
No	95	10	85	
Any family history of psychiatric illness				
Yes	10	6	4	0.003
No	130	19	111	
Any history of psychiatric illnesses?				
Yes	22	8	14	0.01
No	118	17	101	
No living children (including present pregnancy)				
1 to 2	85	14	71	0.5
>2	55	11	44	
Gender of the baby				
Male	78	11	67	0.19
Female	62	14	48	
Expected gender of the baby was different?				
Yes	11	4	7	0.24
No	40	6	34	
No Expectation	89	15	74	
Planned pregnancy?				
Yes	98	8	90	0.0001
No	42	17	25	
Support of husband / in-laws				
Yes	74	6	68	0.001
No	66	19	47	
Any history of domestic violence?				
Yes	38	11	27	0.03
No	102	14	88	
Any history of marital disharmony?				
Yes	46	13	33	0.01
No	94	12	83	

Table 4: Association of obstetric parameters and PPD, (n=140).

Obstetric factors	Total participants	Depressed	Not depressed	P value
No of months postpartum				
<2 months	86	13	73	0.06
2-4 months	35	5	30	
>4 months	19	7	12	
Mode of delivery				
CS	56	10	46	0.14
NVD	74	11	63	
Forceps/vacuum	10	4	6	
Any antepartum complications?				
Yes	33	8	25	0.27
No	107	17	90	
Any complication during pregnancy				
Yes	28	10	18	0.005
No	112	15	97	

Continued.

Obstetric factors	Total participants	Depressed	Not depressed	P value
Any history of epidural anaesthesia				
Yes	12	1	11	0.36
No	128	24	104	
Heard about epidural anaesthesia?				
Yes	37	10	27	0.08
No	103	15	88	
Any history of abortion				
Yes	14	6	8	0.01
No	126	19	107	
Any history of previous children's death				
Yes	3	1	2	0.4
No	137	24	113	
Any history of baby in ICU (current pregnancy)				
Yes	12	5	7	0.06
No	128	20	108	
Initial month feeding problem present?				
Yes	89	21	68	0.019
No	51	4	47	

NVD: normal vaginal delivery; CS: Caesarean section; p value: significant value.

DISCUSSION

The findings of this study suggest that PPD is significantly influenced by a combination of economic, psychosocial, and obstetric factors, similar to other studies conducted in various settings across India and internationally. Among the 140 postpartum mothers in Goa, the prevalence of PPD was found to be 17.8%, which is consistent with rates reported in other studies from India Dubey et al, Modi et al and abroad (Meltzer-Brody et al).[9-11] The study highlights several key risk factors for PPD, with economic dependence, unplanned pregnancies, lack of support from family members, domestic violence, and pregnancy complications standing out as significant predictors of depressive symptoms.

Our study identified economic dependence as a major factor associated with PPD, with economically dependent mothers experiencing a higher rate of depression (p=0.0001). This finding is in line with other studies that have shown that financial insecurity and poverty are strongly linked to mental health issues during the postpartum period (Meltzer-Brody et al and Shriraam et al).[11,12] In particular, a study by Dubey et al in New Delhi also noted that financial dependence was a significant risk factor for PPD, underlining the importance of economic security in supporting maternal mental health.[9] Similarly, unplanned pregnancies were strongly associated with depression in our study (p=0.0001), a result that resonates with findings from other Indian studies, including those by Modi et al and Agarwala et al where unplanned pregnancies were frequently cited as a critical risk factor for PPD.[10,13]

Psychosocial factors, especially lack of social support, were identified as crucial contributors to PPD in this study. We found that lack of support from husbands or in-laws (p=0.001), experiences of domestic violence (p=0.03), and marital disharmony (p=0.01) were all significantly associated with elevated levels of depression. These findings align with the work of Dubey et al and Lanjewar et al who also highlighted the detrimental effects of poor social and spousal support on maternal mental health.[9,14] In particular, lack of emotional support from partners and family has been shown to create significant psychological strain, contributing to the development of depressive symptoms (Patel et al).[2] The role of partner support in preventing PPD is well-documented globally, emphasizing that strong familial and social networks can act as protective factors (Meltzer-Brody et al).[11]

Interestingly, while educational status was not significantly associated with PPD in our study (p=0.26), we did observe a slightly higher rate of depression among educated participants compared to uneducated ones. This contrasts with the findings from other studies, such as that of Agarwala et al who found that higher educational levels were associated with a lower likelihood of developing PPD.[13] However, this discrepancy could reflect regional or cultural differences and the complex interplay between education, SES, and mental health in different communities. In the present study, SES showed a near-significant association (p=0.05), suggesting that economic hardship may outweigh the benefits of education when it comes to mental health outcomes during the postpartum period.

Obstetric factors also played a significant role in our findings. We found that complications during pregnancy (p=0.005), a history of abortion or miscarriage (p=0.01), and initial feeding problems (p=0.019) were all significantly correlated with PPD, corroborating findings from studies in both India and other countries (Shriraam et al and Zohdy et al).[12,15] Pregnancy complications and prior reproductive losses often contribute to feelings of distress, which can increase vulnerability to depression. Similarly,

difficulties with breastfeeding are a well-documented stressor that can exacerbate PPD (Meltzer-Brody et al and Gao et al).[11,16]

Despite these clear associations, certain factors did not show a significant correlation with PPD in our study. For instance, age and type of family structure (nuclear vs. joint) did not appear to influence depression rates significantly, a finding consistent with other studies that report variable associations between age and PPD (Gao et al).[16] This inconsistency in findings may be attributed to differences in cultural, demographic, or regional factors that impact the experience of motherhood and mental health.

Overall, the results of this study underscore the importance of addressing both psychosocial and obstetric factors in the prevention and management of PPD. Economic support, relationship counselling, and mental health services should be integrated into maternal care programs to reduce the risk of PPD. Furthermore, healthcare professionals should be vigilant in identifying and addressing pregnancy complications and breastfeeding difficulties, both of which are critical to maternal well-being. As studies from India and internationally show, PPD remains a significant public health concern, yet health-seeking behaviour remains low (Lanjewar et al).[14] Therefore, greater awareness and access to mental health resources are essential to improving outcomes for new mothers.

Limitation

A limitation of this study is its reliance on self-reported data, which may introduce response bias, especially regarding sensitive topics like mental health and domestic issues. Additionally, the study's sample size, though informative, may limit the generalizability of the findings to broader populations. Future research with larger, more diverse samples and a longitudinal approach would strengthen the ability to draw more comprehensive conclusions about the risk factors and causal pathways for PPD.

CONCLUSION

This study highlights that PPD is influenced by a combination of psychosocial, obstetric, and demographic factors. Psychosocial aspects, such as stress, lack of support, prior psychiatric issues, unplanned pregnancies, and domestic challenges, were significantly linked to higher rates of PPD, underscoring the importance of emotional and social support during the postpartum period. Obstetric factors like pregnancy complications, past abortions, and initial feeding difficulties also increase PPD risk. Demographically, SES and economic dependence emerged as critical factors, with financially dependent women showing greater vulnerability. These findings suggest that comprehensive support-addressing medical, social, and economic needs could effectively reduce PPD rates and improve postpartum well-being for mothers and their families.

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