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ORIGINAL ARTICLE

Prevalence and Risk Factors for Postpartum Depression in Different Birth Settings: A Prospective Study

JAI DEV MAHESHWARI[1], AFTAB HUSSAIN ABRO[2], NARGIS GULAB[3], SADIA KANWAL[4], AMNA NAJAM[5], AMNA ASLAM[6]
[1,2]*Assistant Professor Community Medicine SMBBMC LYARI Karachi*
[3]*Consultant Gynaecologist Department of Gynaecology and Obstetrics Northwest school of medicine Hayatabad Peshawar*
[4]*Associate Professor, Gynae/Obs Department, Al-Nafees Medical College and Hospital, Islamabad*
[5]*Assistant Professor, Gynae/Obs Department, Al-Nafees Medical College and Hospital, Islamabad*
[6]*Associate Professor, Gynae/Obs Department, Avicenna Medical College and Hospital, Lahore*
Correspondence to: Jai Dev Maheshwari, Email: jaidevmaheshwari83@gmail.com

ABSTRACT

Background: Postpartum depression (PPD) significantly affects maternal and child health, with various risk factors influencing its prevalence. Understanding PPD across different birth settings and associated factors is essential for targeted intervention.

Objective: To determine the prevalence of postpartum depression (PPD) and identify its associated risk factors across different birth settings.

Material and Methods: This prospective study included 345 postpartum mothers at Department of Gynaecology and Obstetrics Northwest school of medicine Hayatabad Peshawar , from October to March 2023. Data were collected via a structured questionnaire, including demographic, socioeconomic, and clinical variables, and the Edinburgh Postnatal Depression Scale (EPDS) was used to screen for PPD. Key variables included birth setting (hospital, birthing center, home), mode of delivery, age, education level, socioeconomic status, employment status, and history of depression or anxiety. Statistical analyses were conducted using Chi-square tests to examine associations, with a significance level of $p \leq 0.05$.

Results: PPD was present in 37% (127 out of 345) of participants. A significant association was found between birth setting and PPD, with home births having the highest prevalence (58.3%) compared to hospitals (31.6%) ($p = 0.001$). No significant associations were observed for mode of delivery ($p = 0.398$) or prior mental health history ($p = 0.210$). Sociodemographic factors, including age, socioeconomic status, and employment, were also not significantly associated with PPD.

Conclusion: Birth setting was significantly associated with PPD, highlighting the importance of supportive hospital environments in potentially reducing PPD risk. Further research is needed to explore specific interventions for high-risk groups, particularly in non-hospital birth settings.

Keywords: Postpartum depression, birth setting, maternal mental health, risk factors, Edinburgh Postnatal Depression Scale (EPDS), sociodemographic factors

INTRODUCTION

Postpartum depression (PPD) is a condition affecting a large number of women after childbirth, with important effects on maternal and child well-being. World Health Organization (WHO) estimate the rate of women experiencing depressive symptoms during the postpartum period to range from 10– 15% across the world, but the rate of depressive symptoms of women during the postpaum period in different regions and among various birth settings varied widely[1]. Biological, psychological, and sociocultural factors are all associated with risk of PPD; therefore, it is important to look at PPD rates across distinct birth environments, including hospitals, birthing centers, and home environments, where each may differentially impact maternal mental health[2].

The COVID-19 pandemic further intensified the challenges associated with PPD, with studies showing an increase in prevalence to 34% during this period due to elevated stress, anxiety, and social isolation resulting from lockdowns and restrictions (Chen et al., 2022)[3]. This surge underscored existing disparities in maternal mental health, particularly as women in different birth settings experienced varying levels of support based on socioeconomic factors and access to healthcare (Shuman et al., 2022)[4].

Birth settings themselves are influenced by a range of factors, including cultural preferences, healthcare resources, financial limitations, and personal beliefs. Studies suggest that hospital births, often involving greater medical intervention, differ from home and birthing center deliveries, where a natural approach is emphasized. These differences in care may impact psychological outcomes; for instance, women giving birth at home may experience greater autonomy, potentially reducing PPD risk, though the lack of immediate medical intervention in emergencies can also increase stress (Simpson, 2020)[5].

Certain demographic and clinical factors are consistently associated with an increased risk of PPD across birth settings. Factors like younger maternal age, low socioeconomic status, limited social support, and a prior history of mental health conditions are well-documented PPD risks. Recent studies also suggest that supportive partners or doulas can help mitigate some of these risks, especially in non-hospital settings (Deligiannidis et al., 2023)[6]. Additionally, high stress levels during pregnancy—whether from financial instability or relationship difficulties—are linked to a higher likelihood of developing PPD postpartum (Safi-Keykaleh et al., 2022)[7].

In high-resource countries, disparities in maternal mental health outcomes reflect systemic inequities in healthcare, with Black and Native American women facing disproportionately high PPD rates due to limited access to quality healthcare (Children and Families, 2020)[8]. Addressing these disparities calls for reevaluating maternal healthcare systems to ensure equitable access to mental health services, regardless of birth setting (Wu et al., 2020)[9].

The prevalence and risk factors for postpartum depression in new mothers may differ by birth setting. But there is very little research about how environments such as a hospital, birthing center, or home birth can predispose women to PPD risk. These differences help inform the better fit support systems to the setting. This study attempts to bridge this gap by identifying factors affecting PPD in various birth environments and provide guidance for effective practices to improve the maternal mental health outcome.

MATERIAL AND METHODS

A prospective cross sectional study was carried out from the Department of Gynaecology and Obstetrics Northwest school of medicine Hayatabad Peshawar , from October to March 2023. 345 obstetric patients aged 18 years or older, regardless of method or setting of delivery had given birth within the previous six weeks, were included. Excluded patients were those with severe post-delivery medical complications. The 95% confidence level, 5% margin of error, 33.9% assumed PPD prevalence were used to calculate the sample size[10]

The questionnaire consisted of demographical, socioeconomic and clinical details and data were collected. We used the Edinburgh Postnatal Depression Scale (EPDS), a standard screening tool, to assess PPD. The EPDS threshold was

used to determine the prevalence of mothers with depressive symptoms in terms of PPD Yes or No.

Birth setting was classified as hospital, birthing center and home birth to investigate whether birth setting is associated with risk for PPD. Age was recorded as continuous variable and also grouped into less than 25 years, 25-34 years and greater than or equal to 35 years to examine trends in PPD prevalence by age. Education level was defined as primary, secondary or tertiary in order to determine whether lower education could increase PPD risk allowing lower access to resources or knowledge of postpartum care, socioeconomic status was split into low, middle, and high, based on household income.Employment Status was recorded as employed or unemployed, to evaluate if financial independence or employment-related stress influenced the risk of developing PPD. Mode of Delivery was categorized as vaginal or cesarean, exploring whether differing delivery experiences affected PPD risk, particularly in relation to physical recovery and emotional impact. Finally, History of Depression or Anxiety was noted as a binary variable (yes/no), given its well-established role as a PPD risk factor. Mothers with a documented history of these conditions were recognized as having a potentially higher likelihood of experiencing PPD.

Data were analyzed using SPSS version 24. Means and standard deviations was calculated for age and frequencies and percentages were calculated for categorical variables like birth setting, mode of delivery, PPD, History of depression, Employment status, Socio-economic status, Educational status. Stratification was done for birth setting, mode of delivery, History of depression, Employment status, Socio-economic status, Educational status. Post stratification chi-square test applied to see the effect of these on outcome variables i.e PPD. A p-value of ≤ 0.05 was considered statistically significant.

RESULTS

Total 345 patients were selected for this study. Mean age of the patients was 30.78 ± 7.70 years. Out of 345 patients, PPD was present in 127 (37%) patients. (Fig. 1)A statistically significant association was observed between birth setting and postpartum depression (PPD), with p = 0.001. PPD prevalence was notably different across settings: mothers who delivered in hospitals had the lowest prevalence, with 31.6% (65 out of 206) experiencing PPD and 68.4% (141 out of 206) not affected. In birthing centers, 35.4% (28 out of 79) of mothers reported PPD, slightly higher than in hospitals, but still lower than in home births. Among mothers who delivered at home, PPD was prevalent in 58.3% (35 out of 60), indicating a much higher occurrence compared to other settings. These findings suggest that the hospital environment, with its structured care and immediate medical support, may offer protective factors against PPD, while home births might contribute to a heightened risk, potentially due to limited support and medical intervention. (Table 1)

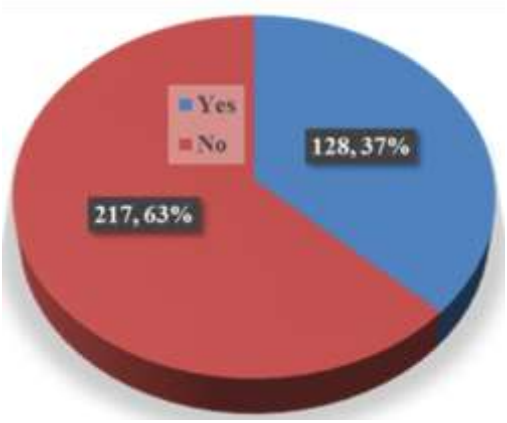

Fig. 1: Prevalence of PPD (n = 345)

No statistically significant association was found between mode of delivery or history of depression/anxiety and postpartum depression (PPD) in this sample, with p-values of 0.398 and 0.210, respectively. Among mothers who delivered vaginally, 38.7% (86 out of 222) reported PPD, compared to 34.1% (42 out of 123) among those who had cesarean deliveries. This similarity suggests that the physical method of delivery may not strongly impact PPD risk in this context. Similarly, while 38.6% (110 out of 285) of mothers without a prior mental health history reported PPD, only 30.0% (18 out of 60) of those with a history of depression or anxiety reported PPD. The slightly lower prevalence among those with a mental health history may reflect the use of coping mechanisms or support systems that help manage mental health postpartum. These findings indicate that neither mode of delivery nor previous mental health conditions were independently associated with PPD within this sample. (Table 2)

Table 1: Association Between Birth Setting and Postpartum Depression (PPD)

Birth Setting	PPD: No n(%)	PPD: Yes n(%)	Total (n)	p-value
Hospital	141 (68.4%)	65 (31.6%)	206	0.001
Birthing Center	51 (64.6%)	28 (35.4%)	79	
Home Birth	25 (41.7%)	35 (58.3%)	60	
Total	217 (62.9%)	128 (37.1%)	345	

Table 2: Association of Mode of Delivery and History of Depression/Anxiety with PPD

Variable	PPD: No n(%)	PPD: Yes n(%)	Total (n)	p-value
Mode of Delivery: Vaginal	136 (61.3%)	86 (38.7%)	222	0.398
Mode of Delivery: Cesarean	81 (65.9%)	42 (34.1%)	123	
History of Depression/Anxiety: No	175 (61.4%)	110 (38.6%)	285	0.210
History of Depression/Anxiety: Yes	42 (70.0%)	18 (30.0%)	60	
Total	217 (62.9%)	128 (37.1%)	345	

Table 3: Association of Demographic and Socioeconomic Variables with PPD

Variable	PPD: No n(%)	PPD: Yes n(%)	Total (n)	p-value
Age Group: <25	55 (60.4%)	36 (39.6%)	91	0.272
Age Group: 25-34	90 (68.2%)	42 (31.8%)	132	
Age Group: ≥35	72 (59.0%)	50 (41.0%)	122	
Education Level: Primary	72 (64.9%)	39 (35.1%)	111	0.842
Education Level: Secondary	92 (61.3%)	58 (38.7%)	150	
Education Level: Tertiary	53 (63.1%)	31 (36.9%)	84	
Socioeconomic Status: Low	94 (65.3%)	50 (34.7%)	144	0.420
Socioeconomic Status: Middle	92 (63.4%)	53 (36.6%)	145	
Socioeconomic Status: High	31 (55.4%)	25 (44.6%)	56	
Employment Status: Unemployed	103 (60.9%)	66 (39.1%)	169	0.462
Employment Status: Employed	114 (64.8%)	62 (35.2%)	176	
Total	217 (62.9%)	128 (37.1%)	345	

No significant associations were found between postpartum depression (PPD) and any demographic or socioeconomic variables, including age group (p = 0.272), education level (p = 0.842), socioeconomic status (p = 0.420), or employment status (p = 0.462). Among age groups, PPD prevalence was slightly higher in mothers aged 35 and older, with 41.0% (50 out of 122) experiencing PPD, compared to 39.6% (36 out of 91) in those under 25 and 31.8% (42 out of 132) in the 25-34 age group.

Education level showed minimal variation, with 35.1% (39 out of 111) of mothers with primary education, 38.7% (58 out of 150) with secondary education, and 36.9% (31 out of 84) with tertiary education reporting PPD. Socioeconomic status also did not show substantial differences: 34.7% (50 out of 144) of mothers with low socioeconomic status reported PPD, 36.6% (53 out of 145) in the middle group, and 44.6% (25 out of 56) in the high group. Similarly, employment status did not correlate significantly with PPD, with 39.1% (66 out of 169) of unemployed mothers and 35.2% (62 out of 176) of employed mothers experiencing PPD. These results suggest that demographic and socioeconomic factors, by themselves, may not be strong predictors of PPD in this sample. (Table 3)

DISCUSSION

Our study's findings underscore the influence of birth setting on postpartum depression (PPD) prevalence. Home births showed the highest PPD prevalence (58.3%), compared to hospital (31.6%) and birthing center (35.4%) births. This finding highlights the importance of structured medical support in hospital settings, potentially acting as a protective factor against PPD. Wildali et al.[10] similarly observed that supportive healthcare environments, with access to immediate care and resources, were associated with reduced PPD rates in the Palestinian healthcare context, suggesting that a lack of structured care may elevate PPD risk in home births.

Our study also found no significant association between mode of delivery and PPD, which aligns with the findings of Froeliger et al.[11]. In their study, no significant differences were observed in PPD rates based on whether women had vaginal or cesarean deliveries, challenging the assumption that cesarean deliveries increase PPD risk due to surgical recovery. Both studies highlight that the environment of care, rather than the physical method of delivery, may play a more significant role in maternal mental health outcomes postpartum.

Contrastingly, our results revealed no significant association between a history of depression or anxiety and PPD, which differs from findings by Hanach et al.[12]. Their study among women in the UAE identified a previous history of mental health issues as a significant predictor of PPD. The disparity suggests that mothers with prior mental health issues in our study may have received adequate mental health support that helped manage PPD risk, a factor that could vary based on healthcare setting and the availability of resources.

Our data also did not find significant correlations between PPD and socioeconomic or demographic factors, such as age, education level, or employment status. However, Agrawal et al.[13] emphasized that socioeconomic challenges and gestational complications, such as gestational diabetes, were key predictors of PPD, indicating potential cultural and regional influences. This disparity suggests that, while demographic factors alone may not predict PPD risk in certain contexts, they may interact with other psychosocial factors to increase PPD risk in diverse populations.

Fan et al.[14] provided additional perspective, noting that PPD prevalence in Sri Lanka varied significantly based on socioeconomic and demographic factors, with higher risks seen in socioeconomically disadvantaged women. This reinforces the complexity of PPD determinants, as both our findings and Fan et al.'s work suggest that socioeconomic context and local healthcare practices may strongly influence PPD risk.

Moreover, our findings correspond to those of Gastaldon et al,[15] who pointed out that socioeconomic status and history of mental health threaten the risk of PPD, but that environmental and support related factors take a more significant role.

Consistent with our results, Goker et al.[16] also reported no significant impact of delivery mode on PPD. They found that psychosocial factors, rather than mode of delivery, were associated most strongly with an increased likelihood of PPD risk, suggesting the importance of supportive care in the period following delivery.

Further, our findings are consistent with Azad et al.[17] who reported in urban slums in Bangladesh that economic hardship and poor psychosocial support increased the risk for PPD. This is consistent with our emphasis on comprehensive care on mothers who are delivering in settings outside of hospital, particularly where such care may be unavailable.

Finally, Amer et al.[18] concluded that lack of support is a critical predictor of PPD across multiple countries and recommends support systems in all birth environments. Our finding that structured hospital settings may provide the support needed to combat PPD risk compared to the higher rates of PPD observed among home births is consistent with this.

CONCLUSION

Results of our study revealed an association of birth setting with development of PPD, in that PPD rates are high in home births compared to hospital births. Previous history of depression, mode of delivery and some sociodemographic variables were not associated with PPD. PD prevention and treatment need a multidimensional approach that includes support in settings of birth, screening for mental health, and intervention strategies tuned to identify at risk populations. Future research should further explore how to use these dynamics for the development of culturally sensitive interventions to improve maternal mental health outcomes.

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