Original Article

Association of Postpartum Depression with Mode of Delivery: A Cross-Sectional Study at A Psychiatry Institute of Rawalpindi

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ABSTRACT

Objective: To determine the association between postpartum depression and mode of delivery among women presenting to a psychiatry institute in Rawalpindi.

Study Design: Cross-sectional analytical study

Place and Duration of Study: This study was conducted at the Armed Forces Institute of Mental Health Rawalpindi December 16 till March 15, 2026.

Methods: This study was conducted including 210 postpartum women within 6 weeks of delivery. Postpartum depression was assessed using the Edinburgh Postnatal Depression Scale, with a score ≥13 indicating depression.

Results: The mean age of participants was 29.8 ± 5.7 years, and the overall frequency of postpartum depression was 40.0%. Depression was significantly more common in women undergoing cesarean section compared to vaginal delivery (57.1% vs 42.9%, p = 0.002), with emergency cesarean showing a stronger association. Women with postpartum depression had higher mean EPDS scores (16.8 ± 3.2 vs 8.2 ± 2.6; p <0.001). Additional factors significantly associated with depression included age >30 years, low socioeconomic status, unplanned pregnancy, primiparity, poor neonatal health, and inadequate social support (p <0.05).

Conclusion: Postpartum depression is significantly associated with cesarean delivery, particularly emergency procedures, along with multiple demographic and psychosocial factors. Early screening and targeted interventions are essential to improve maternal mental health outcomes.

Key Words: Postpartum depression; Mode of delivery; Cesarean section; Vaginal delivery; EPDS; Maternal mental health.

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INTRODUCTION

Postpartum depression (PPD) is a mood disorder that usually occurs in about 10-20 percent of women after giving birth and is a leading cause of maternal morbidity[1]. It has the following symptoms which include persistent low mood, fatigue, sleeping disturbances and lack of interest in daily activities which significantly affect maternal functioning and mother infant bonding[2]. PPD has also been linked to unfavorable neonatal outcomes such as slow growth, retarded cognitive and emotional developments, among others[3]. PPD etiology is multifactorial including hormonal alterations, psychological stressors and social factors. Quick changes in postpartum hormones, especially of estrogen and progesterone are known to affect mood regulation[4]. Besides this, deficit of social support, financial pressures, marital problems and unexpected pregnancy are also factors that have heightened risks of developing depressive symptoms[5]. Psychiatric history is also a strong predisposing factor that is already established[6]. Mode of delivery has been argued as a significant obstetric factor affecting the postpartum mental health. Risk factors of PPD may include cesarean section, particularly emergency operations because of the stress of surgery, slow recovery period, and adverse childbirth experiences[7]. On the other hand, vaginal birth is frequently related to faster recovery and improved mental consequences[8]. Nevertheless, the literature lacks consistency in its findings. There are reports that the incidence of PPD is higher after a cesarean section has taken place[9], but a few also conclude that there is no significant association when controlling variables are taken into consideration[10]. This may differ because of different

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study designs, populations, and measurement instruments[11]. Postpartum depression is not properly diagnosed in Pakistan and other low-resource environments because of stigma and poor mental care[12]. Other factors like the sociocultural factors, including the gender roles and pressure of the family as well as lack of support systems on the mother may increase psychological distress on the mother[13]. Nonetheless, there is a lack of local data on the connection between mode of delivery and PPD[14]. This relationship is critical in determining the high-risk mothers and putting in place early screening measures[15]. Early diagnosis and treatment of PPD can enhance the maternal health and newborn outcomes[16]. Thus, the proposed research will evaluate the relationship between the mode of delivery and postpartum depression among women reporting to a psychiatry institute in Rawalpindi.

METHODS

This cross-sectional analytical study was conducted at Armed Forces Institute of Mental Health Rawalpindi December 16 till March 15, 2026, including 210 postpartum women presenting within 6 weeks after delivery. Patients were enrolled consecutively during the study period to determine the association between postpartum depression and mode of delivery.

Inclusion Criteria

- Women aged 18–45 years within 6 weeks postpartum
- Women who had delivered either by vaginal delivery or cesarean section
- Women presenting to the psychiatry institute for evaluation
- Women willing to participate and provide informed consent

Exclusion Criteria

- Women with a prior diagnosed psychiatric illness before pregnancy
- Women with severe postpartum medical or surgical complications
- Women with stillbirth or neonatal death
- Women with incomplete information or unwilling to participate

Data Collection: After obtaining institutional approval, data were collected using a structured proforma. Demographic variables included age, residence, education, occupation, and socioeconomic status. Obstetric variables included parity, planned or unplanned pregnancy, type and mode of delivery, and time since delivery. Postpartum depression was assessed using the Edinburgh Postnatal Depression Scale (EPDS), with a score of ≥13 considered indicative of depression. Additional information regarding family support and neonatal health status was also recorded.

Statistical Analysis: Data were entered and analyzed using SPSS version 26.0. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequency and percentage. The association between postpartum depression and mode of delivery was assessed using the chi-square test. A p-value of ≤0.05 was considered statistically significant.

RESULTS

The mean age was 29.8 ± 5.7 years, with higher age in the PPD group (31.2 ± 5.9 vs 28.9 ± 5.4 years; p = 0.006). Women >30 years were more likely to have PPD (42.9%), while most non-PPD were ≤30 years (73.0%) (p = 0.018). Rural residence (50.0% vs 34.9%), lower education (52.4% vs 36.5%), and low socioeconomic status (57.1% vs 38.1%) were significantly associated with PPD (p <0.05). Occupation showed no significant difference (p = 0.081).

Table No. 1. Demographic and Clinical Characteristics of Participants According to Postpartum Depression (N = 210)

Variable	Category	Overall (N=210)	No PPD (n=126)	PPD (n=84)
Age (years)	Mean ± SD	29.8 ± 5.7	28.9 ± 5.4	31.2 ± 5.9
Age Group	≤30 years	140 (66.7%)	92 (73.0%)	48 (57.1%)
	>30 years	70 (33.3%)	34 (27.0%)	36 (42.9%)
Residence	Urban	124 (59.0%)	82 (65.1%)	42 (50.0%)
	Rural	86 (41.0%)	44 (34.9%)	42 (50.0%)
Education	≥Secondary	120 (57.1%)	80 (63.5%)	40 (47.6%)
	<Secondary	90 (42.9%)	46 (36.5%)	44 (52.4%)
Occupation	Housewife	162 (77.1%)	92 (73.0%)	70 (83.3%)
	Employed	48 (22.9%)	34 (27.0%)	14 (16.7%)
Socioeconomic Status	Low	96 (45.7%)	48 (38.1%)	48 (57.1%)
	Middle/High	114 (54.3%)	78 (61.9%)	36 (42.9%)

Primiparity (54.8% vs 41.3%; p = 0.048) and unplanned pregnancy (50.0% vs 31.7%; p = 0.007) were significantly associated with PPD. Cesarean delivery had higher depression rates (57.1% vs 42.9% in vaginal; p = 0.002), particularly emergency cesarean (40.5% vs 15.9%; p = 0.013). Postpartum duration was not significant (p = 0.154), while poor neonatal health was more common in PPD (31.0% vs 12.7%; p = 0.002).

Table No. 2. Obstetric Characteristics According to Postpartum Depression (N = 210)

Variable	Category	Overall (N=210)	No PPD (n=126)	PPD (n=84)	p-value
Parity	Primiparous	98 (46.7%)	52 (41.3%)	46 (54.8%)	0.048
	Multiparous	112 (53.3%)	74 (58.7%)	38 (45.2%)	0.048
Pregnancy Type	Planned	128 (61.0%)	86 (68.3%)	42 (50.0%)	0.007
	Unplanned	82 (39.0%)	40 (31.7%)	42 (50.0%)	0.007
Mode of Delivery	Vaginal	118 (56.2%)	82 (65.1%)	36 (42.9%)	0.002
	Cesarean	92 (43.8%)	44 (34.9%)	48 (57.1%)	0.002
Type of Cesarean	Elective	38 (18.1%)	24 (19.0%)	14 (16.7%)	0.013
	Emergency	54 (25.7%)	20 (15.9%)	34 (40.5%)	0.013
Postpartum Duration	≤3 weeks	156 (74.3%)	98 (77.8%)	58 (69.0%)	0.154
	>3 weeks	54 (25.7%)	28 (22.2%)	26 (31.0%)	0.154
Baby Health	Healthy	168 (80.0%)	110 (87.3%)	58 (69.0%)	0.002
	Ill	42 (20.0%)	16 (12.7%)	26 (31.0%)	0.002

Table No. 3. Psychosocial and Clinical Factors Associated with Postpartum Depression (N = 210)

Variable	Category	Overall (N=210)	No PPD (n=126)	PPD (n=84)	p-value
EPDS Score	Mean ± SD	11.6 ± 4.8	8.2 ± 2.6	16.8 ± 3.2	<0.001
Family Support	Adequate	132 (62.9%)	96 (76.2%)	36 (42.9%)	<0.001
	Inadequate	78 (37.1%)	30 (23.8%)	48 (57.1%)	<0.001
Previous Depression	Yes	34 (16.2%)	10 (7.9%)	24 (28.6%)	<0.001
	No	176 (83.8%)	116 (92.1%)	60 (71.4%)	<0.001
Social Support	Present	142 (67.6%)	102 (81.0%)	40 (47.6%)	<0.001
	Absent	68 (32.4%)	24 (19.0%)	44 (52.4%)	<0.001

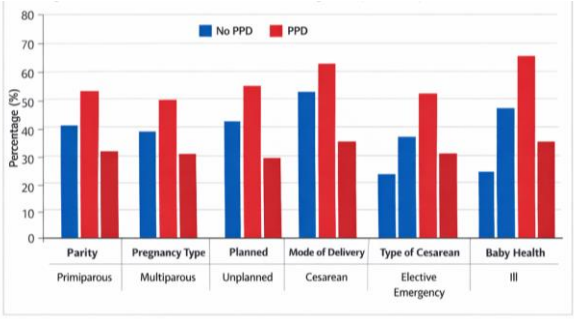

Figure No. 1. Distribution of Obstetric Factors According to Postpartum Depression Status (n = 210)

The mean EPDS score was higher in the PPD group (16.8 ± 3.2 vs 8.2 ± 2.6; p <0.001). Inadequate family support (57.1% vs 23.8%), previous depression (28.6% vs 7.9%), and lack of social support (52.4% vs 19.0%) were all strongly associated with PPD (p <0.001).

Mode of delivery showed a significant association with PPD (p = 0.002). Depression was more frequent after cesarean section (57.1%) compared to vaginal delivery (42.9%). Emergency cesarean had the highest association (40.5% vs 15.9%), while elective cesarean showed a weaker relationship (p = 0.013).

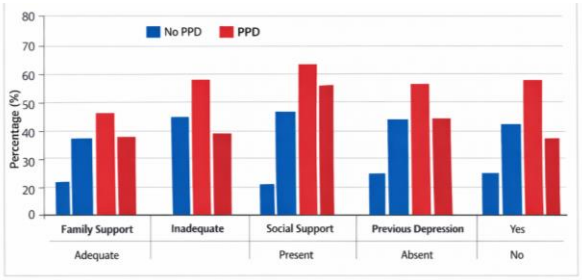

Figure No. 2. Psychosocial and Clinical Factors Associated with Postpartum Depression (n = 210)

Table No. 4. Association of Mode of Delivery with Postpartum Depression (N = 210)

Mode of Delivery	Overall (N=210)	No PPD (n=126)	PPD (n=84)	p-value
Vaginal Delivery	118 (56.2%)	82 (65.1%)	36 (42.9%)	0.002
Cesarean Section	92 (43.8%)	44 (34.9%)	48 (57.1%)	0.002
Elective Cesarean	38 (18.1%)	24 (19.0%)	14 (16.7%)	0.013
Emergency Cesarean	54 (25.7%)	20 (15.9%)	34 (40.5%)	0.013

DISCUSSION

This research study showed that postpartum depression was highly linked to various demographic, obstetric and psychosocial conditions whereby there was significantly high incidence among those women who delivered via cesarean section especially emergency delivery. The number of women having PPD (40.0%) in this study is rather high, and this could be attributed to the fact that the facility is a psychiatry institute that could have more women presenting with psychological distresses. Other studies previously also indicated high levels of postpartum depression in clinical or high-risk groups as opposed to community based samples[17]. The age was significantly related and older women (>30 years) were more likely to develop PPD. This could be associated with more psychosocial stresses, more expectations and more obstetric risk in this age group. The same conclusions have been drawn in previous studies in which advanced maternal age was correlated with more depressive symptoms in the postpartum period[18]. The status of socioeconomic and educational barriers also contributed greatly with less educated and low socioeconomic women having higher rates of PPD. These results indicate that maternal psychological vulnerability is caused by limited resources, less health awareness and financial stress. The past studies have continually emphasized the low socioeconomic status as a crucial factor leading to postpartum depression[19]. Cesarean section, mostly emergency cesarean, was among obstetric factors in which the PPD was found to be strongly associated. The women who had cesarean delivery were greatly affected as their depression was much higher (57.1) than those who gave birth through vaginal delivery (42.9). It was particularly the case with emergency procedures that were associated with greater psychological distress, which may have been caused by sudden complications, fear, and the inability to control the course of childbirth. The same trends have been seen in the past studies as cesarean birth particularly emergency birth was related to the increased postpartum depression risk[20].

PPD was also greatly correlated with primiparity and unexpected pregnancy. The first-time mothers can be more anxious and unprepared, and the unexpected pregnancy can also be one of the sources of emotional stress and a lack of acceptance of motherhood. These results are consistent with other studies that have described the two variables as significant predictors of postpartum depression[21]. Psychosocial factors were most related. Lack of family support, social support, as well as history of depression in the past were found to be much higher in women with PPD. These results highlight the importance of emotional and social support systems, in order to safeguard the maternal mental health. The evidence provided by the previous literature has repeatedly shown that the social support is poor, and a past psychiatric history are some of the strongest predictors of postpartum depression[22]. There was also a significant association of neonatal health status with mothers of sick babies experiencing depressive rates. This could either be as a result of heightened anxiety, care giving burden, and fear of the health of the child. Such parallels have been observed in earlier literature, with negative perinatal experiences adding to the maternal psychological distress levels. On the whole, the results of the conducted study indicate that postpartum depression is a multifactorial disease that is determined by demographic, obstetric, and psychosocial factors. Closely tied to the cesarean birth and emergency surgeries, the fact is that psychological screening and support of high-risk mothers should be the priority. These results are in line with the past studies and support the center of interest of including the mental health assessment in the general postpartum care.

CONCLUSION

It is concluded that postpartum depression is highly prevalent and significantly associated with mode of delivery, particularly cesarean section, with the strongest association observed in emergency procedures. Additionally, factors such as older maternal age, low socioeconomic status, lower education, primiparity, unplanned pregnancy, poor neonatal health, and inadequate social and family support were significantly linked with increased risk of postpartum depression. These findings emphasize that postpartum depression is a multifactorial condition, and early identification of high-risk mothers through routine screening especially among those undergoing cesarean delivery is essential to ensure timely intervention and improved maternal and neonatal outcomes.

Author's Contribution:

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Drafting or Revising Critically:	Asif Azeem, Isbah Gul, Tariq Raheem
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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