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Contributory Factors and Clinical Manifestations of Post Natal Depressive Illness in Women

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ABSTRACT

Objective: To determine frequency, severity and related socio-demographic and clinical variables of postpartum depression (PPD) using validated screening tools in postpartum women.
Study Design: Cross-sectional Study.
Place and Duration of Study: Pak Emirates Military Hospital Rawalpindi, Pakistan from Jul 2024 to Jul 2025
Methodology: This cross-sectional analytical study enrolled 2,000 postpartum women presenting for routine follow-up visits between 6 to 10 weeks to 1 year after delivery at a tertiary care hospital in Rawalpindi. Depressive symptoms were assessed using the Edinburgh Postnatal Depression Scale (EPDS) as the primary screening tool, with the Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7) administered concurrently to capture the broader burden of comorbid depression and anxiety.
Results: Using a validated screening threshold of EPDS ≥13, one in three women (33.8%) screened positive for clinically significant postpartum depressive symptoms. Concurrent administration of the PHQ-9 and GAD-7 corroborated these findings, with 29.5% of participants meeting the threshold for moderate-to-severe depression and 26.7% falling within the clinically significant range for anxiety. Multivariate logistic regression identified inadequate social support, a prior history of psychiatric illness, and obstetric complications as the strongest independent predictors of PPD.
Conclusion: This research found that almost 1/3 of postpartum women had met clinically significant depressive symptoms, which is greater than the prevalence found in high-income nations.

Keywords: Depression, Edinburgh mental health scale, Generalized Anxiety Disorder-7, Patient Health Questionnaire-9, Postpartum depression.

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INTRODUCTION

A major public health issue that affects women worldwide after childbirth is postpartum depression (PPD). Persistent depressions, emotional instability, exhaustion, trouble focusing, sleep difficulties, and, in extreme situations, suicidal thoughts are its hallmarks. Although it usually appears in the first four to six weeks after giving birth, it can appear at any time in the first year following delivery. In contrast to the temporary "baby blues" that up to 80% of new moms encounter, postpartum depression (PPD) is more severe and long-lasting, with detrimental effects on the wellbeing of both mothers and infants, such as weakened mother-infant attachment, decreased breastfeeding success, and poor early childhood development.[1-3]

There are significant regional and socioeconomic variations in the prevalence of PPD worldwide. According to estimates from the World Health Organization, between 10% and 20% of women in high-income countries and up to 25% and 40% of women in low- and middle-income countries have a significant depressive episode in the first year after giving birth.[4–6] 30–40% of postpartum women in South Asia have been reported to have depression symptoms, highlighting the disproportionate burden carried by places with little resources where mental health screening and access to care are still insufficient.[7] PPD is a complex etiology that includes hormonal changes, especially the postpartum drop in progesterone and estrogen, neurochemical dysregulation, and psychosocial stresses such financial difficulties, marital discord, and a lack of social support. Risk is also increased by a history of anxiety, depression, or any mental disease.[8–9]

Despite its clinical importance, PPD is still underdiagnosed and undertreated, especially in low-income environments where stigma around mental illness is still present, screening is uneven, and knowledge is low. Early detection is essential because prompt intervention can significantly enhance maternal outcomes and promote the healthy development of infants. Using the Edinburgh

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Postnatal Depression Scale (EPDS) as the main screening tool and the Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7) to capture comorbid depressive and anxiety symptoms, this study seeks to determine the prevalence of PPD and identify associated sociodemographic and clinical risk factors among postpartum women.

METHODOLOGY

This cross-sectional analytical study was conducted at the Department of Obstetrics and Gynecology, a tertiary care hospital, Rawalpindi, Pakistan from July, 2024 to July, 2025. The Institutional Review Board of the Military Hospital, Rawalpindi provided ethical approval. All subjects provided written informed permission before to enrollment.

Inclusion Criteria: The study included postpartum women between the ages of 18 and 45 who had given birth to a live child and were going to their regular postnatal follow-up appointments six to ten weeks after giving birth.

Exclusion Criteria: Excluded women were who had been diagnosed with a serious mental illness before becoming pregnant, such as schizophrenia, bipolar disorder, or psychotic depression. Women with significant medical or obstetric difficulties needing intensive care or hospitalization during the interview period were also excluded, as were those using psychotropic medication or undergoing active psychiatric treatment at the time of assessment. Women who refused or withdrew consent, as well as those with substantial cognitive impairment, intellectual disability, or serious communication challenges that would impede participation, were also eliminated.

The sample size was determined using OpenEpi software, with a confidence level of 95%, a margin of error of 5%, and a reference prevalence of 12.5% for PPD, as published by Yousaf *et al*.[10] The calculated minimum sample size was 168. A total of 2,000 people were recruited to ensure enough representation and adjust for non-response.

Enrollment was limited to women who could speak English or the native language fluently and who gave written informed permission.

Eligible individuals who attended postnatal follow-up appointments were recruited via non-probability sequential sampling. Data were gathered using controlled, face-to-face interviews conducted by qualified healthcare professionals in a private clinical setting to ensure anonymity and encourage open communication. Each interview lasted between 20 and 25 minutes and was conducted in the native language. The structured interview guide was created after conducting a thorough study of the available research on PPD and maternal mental health. It is organized into three sections: sociodemographic factors, obstetric and clinical history, and postpartum emotional and behavioral symptoms. Two psychiatrists and one public health researcher conducted an expert evaluation to confirm content validity. The instrument was pilot-tested on 50 postpartum women (not included in the final study) to ensure clarity, cultural appropriateness, and relevance, with minor changes made based on participant comments.

The instrument was pilot-tested on 50 postpartum women (who were not included in the final study) to ensure clarity, cultural appropriateness, and relevance, with minor changes based on participant comments. Interviewers went through a two-day standardized training program on instrument administration, research ethics, and emotional distress treatment.The sociodemographic data gathered included age, degree of education, employment status, household income, marital status, family structure, and perceived spousal or household support. Clinical information includes parity, mode of delivery, pregnancy or labor difficulties, current breastfeeding status, and a history of mental illness.

The Edinburgh Postnatal Depression Scale (EPDS) was the major screening instrument. The EPDS is a validated 10-item self-report scale developed to identify depression symptoms in the postpartum period. Each item is assessed on a 4-point Likert scale (0-3) depending on symptom frequency in the previous seven days, for a total score ranging from 0 to 30. Clinically severe depression symptoms were defined as a cutoff score of ≥13, in line with worldwide screening criteria.[11]

The Patient Health Questionnaire-9 (PHQ-9) was used concurrently to cross-validate the severity of depression symptoms. This 9-item scale assesses basic symptoms of depression, including anhedonia, hopelessness, sleep and food disorder, exhaustion, concentration trouble,

psychomotor disturbances, and suicidal ideation, assessed on a 0-3 frequency scale over the last two weeks.[12]

Comorbid anxiety symptoms were measured with the Generalized Anxiety Disorder-7 (GAD-7) scale.[13] To account for differing reading levels, all three tests were administered with the assistance of an interviewer. Validated local-language translations were used, which were created using a forward-backward translation procedure by multilingual mental health specialists to verify semantic and conceptual comparability.

An observational checklist embedded in the interview guide was also used to document clinical signs of postpartum distress, such as verbal indicators of hopelessness, guilt, low affect, decreased maternal-infant interaction, sleep disturbance, irritability, social withdrawal, appetite changes, and inadequate self-care.

Participants who tested positive on any instrument or showed clinically significant behavioral signs were promptly referred to the psychiatric outpatient unit for further evaluation.

The data was analyzed using IBM SPSS Statistics version 26. All variables were analyzed using descriptive statistics such as frequencies, means, and standard deviations. Chi-square tests were used to investigate the relationships between sociodemographic and clinical factors and postpartum depression symptoms.

RESULTS

The average age of the 2,000 postpartum women in the study was 27.9±5.0 years. With a cutoff of ≥13 on the Edinburgh Postnatal Depression Scale (EPDS), 33.8% of women (n=676) had clinically severe postpartum depression symptoms. 29.5% of participants had a score of ≥10 on the PHQ-9, which indicates moderate-to-severe depression, and 26.7% had a score of ≥10 on the GAD-7, which falls within the clinically relevant range for anxiety (Table-I).

The majority of participants were in the 25–35 age group (69.2%), followed by the 18–24 age group (23.0%) and those aged over 35(7.8%). Most women resided in urban areas (63.4%) and nuclear families (53.8%), while 46.2% lived in joint family setups. Regarding education, 63.9% had attained higher education, 23.8% had completed primary to secondary schooling, and 12.3% had received no formal education (Figure). Nearly three-quarters of participants (73.1%) were unemployed, while 26.8% were employed. More than half (57.5%) reported a monthly household income below the national average. Clinically, 9.8% of women had a history of psychiatric illness and 31.8% reported obstetric complications including preeclampsia, antepartum hemorrhage, or prolonged labor. Cesarean sections accounted for 44.2% of deliveries, comprising 27.5% emergency and 16.7% elective procedures. Multiparous women constituted 54.0% of the cohort. Women with unplanned.

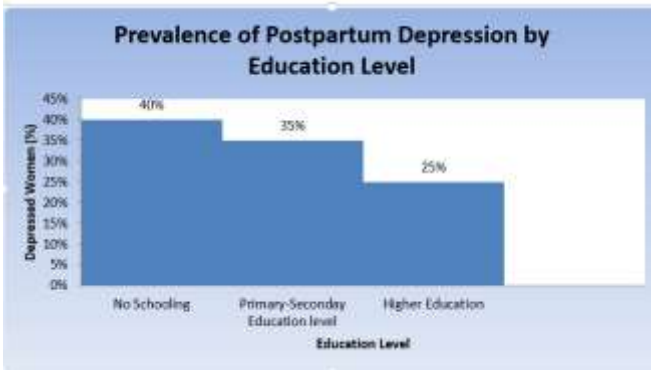

Figure: Frequency of Postpartum Depression by Education Level (n=2,000)

Table-I: Sociodemographic traits and their Correlation with Depression Symptoms (EPDS ≥13 (n=2,000)

Parameters	Depressed (n=556)	Not Depressed (n=1444)	*p*-value
Age Group n (%)			
18–24 years	142 (30.9)	318 (69.1)	0.182
25–35 years	370 (26.7)	1014 (73.3)	
>35 years	40 (25.6)	116 (74.4)	
Education Level n (%)			
No formal schooling	100 (40.7)	146 (59.3)	0.061
Primary–Secondary	170 (35.7)	306 (64.3)	
Higher education	288 (22.5)	990 (77.5)	
Employment Status n (%)			
Employed	96 (18.0)	440 (82.0)	<0.001
Unemployed	460 (31.4)	1004 (68.6)	
Household Income n (%)			
Below national average	446 (38.8)	704 (61.2)	<0.001
Above national average	110 (12.9)	740 (87.1)	
Family Structure n (%)			
Nuclear family	356 (33.1)	720 (66.9)	0.032
Joint family	200 (21.6)	724 (78.4)	

pregnancies showed a significantly higher prevalence of depressive symptoms compared to those with planned pregnancies (37.4% vs. 21.9%, p<0.001).

The mean EPDS score was 10.9±5.7. Bivariate analyses revealed that unemployment (p<0.001), low

household income (p<0.001), and nuclear family structure (p=0.032) were significantly associated with higher depressive symptoms. Among clinical variables, history of psychiatric illness (69.4% vs. 23.3%, p<0.001), obstetric complications (41.8% vs. 21.3%, p<0.001), unplanned pregnancy (37.4% vs. 21.9%, p<0.001), and mode of delivery (p=0.048) were all significantly associated with depression scores (Table-II).

Table-II: Clinical Characteristics and their Correlation with Depressive Symptoms (n=2,000)

Parameters	Depressed (n=556)	Not Depressed (n=1444)	*p*-value
Parity n (%)			
Primiparous	300(32.6)	620(67.4)	0.094
Multiparous	258(23.9)	822(76.1)	
Pregnancy Planning n (%)			
Planned	270(21.9)	964(78.1)	<0.001
Unplanned	286(37.4)	480(62.6)	
Obstetric Complications n (%)			
Present	266(41.8)	370(58.2)	<0.001
Absent	290(21.3)	1074(78.7)	
Mode of Delivery n (%)			
Normal vaginal delivery	280(25.1)	836(74.9)	0.048
Emergency C-section	180(32.7)	370(67.3)	
Elective C-section	98(29.3)	236(70.7)	
History of Psychiatric Illness n (%)			
Present	136 (69.4)	60 (30.6)	<0.001
Absent	420 (23.3)	1384 (76.7)	

DISCUSSION

About 1/3rd of women in this cohort showed clinically significant post-partum depressive symptoms, according to the EPDS. PHQ-9 and GAD-7 were applied as complementary measures to measure general depressive and comorbid anxiety, respectively. This method made it possible

to evaluate maternal mental health comprehensively, which emphasizes that the depressive and anxiety symptoms are often mixed in the postpartum. Our results support that socio-demographic and clinical variables, such as low income, partner support deficiency, obstetric complications, and past psychiatric history, are critical predictors of postpartum depression as found in previous studies. This work has a postpartum-specific and general mental health view by employing EPDS as the main instrument and PHQ-9 and GAD-7 as secondary ones. According to this research, 33.8% of subjects had clinically severe depression symptoms, as indicated by scores above the PPD clinical criterion (EPDS ≥13). Similarly, 29.5% of individuals reported moderate-to-severe depressive symptoms on the PHQ-9, while 26.7% of participants scored in the clinically significant range for anxiety on the GAD-7.

Postpartum depression is a significant societal issue in all countries worldwide, and the rates of its incidence differ depending on the geographical, socioeconomic, and cultural backgrounds. In their prospective observational research, Zejnullahu *et al*., discovered a prevalence level of PPD to be approximately 21 percent at a teaching hospital in Kosovo, and found pregnancy complications, fear of childbirth, prenatal anxiety and poor marital relations to be major predictors.[14] These obstetric and psychosocial considerations find their reflection in various studies where the multifactorial etiology of PPD is mentioned.

Valverde *et a.,l* conducted a systematic review of the effectiveness of psychodynamic psychotherapy with relatively limited research indicating that although psychological treatments are effective in mild to moderate PPD symptoms, trials have not been conducted adequately due to limited sample sizes with adequate controls indicating that there is a need to conduct a robust randomized controlled trial to ascertain the effectiveness of psychological treatments.[15] To complement this systematic review by Jia *et al*., and Wang, 84 studies were included and the authors emphasize the necessity to integrate biological, psychosocial, and cultural factors to develop effective, equitable PPD interventions, including the application of screening tools (such as Edinburgh Postnatal Depression Scale (EPDS)) and the use of evidence based interventions (such as cognitive behavioral therapy and pharmacological interventions like brexanolone).[16]

The effects of COVID 19 pandemic on PPD have been tremendous. According to a meta-analysis by Chen *et al.,* the pooled prevalence of PPD during the pandemic skyrocketed to 34, which is significantly higher than the percentages in the pre pandemic times, and more psychosocial distress due to quarantine and loss of access to health services was observed.[17]

Consistent with this, Ostacoli *et al*., concluded that women giving birth during the pandemic had higher rates of depressive and posttraumatic stress symptoms and that the presence of supportive healthcare staff reduced the levels of psychological distress, which also reflects the importance of the social support system.[18]

The risk factors of PPD are wide and go beyond the psychosocial aspects to cover biological and socio-demographic factors. The prospective study by Zhu *et al*., in China showed that monthly

income, employment, thyroid, parity, and unintended pregnancy were important factors that contributed to the risk of depression throughout the perinatal period.[19]

In the comprehensive cohort study of more than 330,000 pregnancies, the researchers of Johansen *et al*., highlighted the former psychiatric conditions, especially history of depression and anxiety disorders as the significant risk factors of having PPD, and suggested the comprehensive assessment of the psychiatric history to determine high risk women.[20]

Pharmacy has come forward with new promising interventions to PPD. Yao *et al*. showed that use of intraoperative ketamine during cesarean section was a powerful intervention that lowered PPD symptoms one week after delivery than placebo.[21]

Likewise, the study by Chen *et al*., indicated that adjunctive use of esketamine in the perioperative setting minimized the incidence of PPD and depressive symptoms among women who were subjected to elective cesarean operation.[22]

Li *et al*., also found that patient-controlled intravenous analgesia reduced PPD at 42 days after delivery and reduced pain management without causing more side effects when combined with esketamine. 23 Also, Zhou *et al*., reported that dexmedetomidine is effective to prevent the incidence of PPD in women with prenatal depression who are delivered by cesarean section.[24]

Although the large sample of the study and various validated screening tools contribute to its reliability enhancement, some limitations should be noted. Limitations of the cross-sectional design such as lack of causal inference and the findings obtained by a self-assessment questionnaire can be subject to social desirability bias, particularly in cultures where it is not socially acceptable to have mental illnesses. Future longitudinal studies will allow investigation of symptom patterns in the course of time, hormonal and neurobiological factors, and culturally adapted interventions efficacy.

CONCLUSION

Overall, this paper has summarized the important finding that 1/3 of postpartum women have serious depressive symptoms, frequently accompanied by anxiety, and there are several sociodemographic and obstetric risk factors that predispose them to this pathology. Through routine screening, early identification and prompt intervention of PPD would go a long way in mitigating the burden of PPD and patient outcomes. Healthcare providers and policymakers need to ensure maternal mental health is a part of postnatal care and is not disregarded when resources are limited.

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

NK & SRK: Data acquisition, data analysis, critical review, approval of the final version to be published.

SZ & QA: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

RM & HAW & AT: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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