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Original Article

Severity of Depression Among Prepartum and Postpartum Mothers: A Comparative Cross-sectional Study Using the PHQ-9 at A Tertiary Care Hospital

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Abstract

Objective: To determine the severity of depression in prepartum and postpartum women at Jinnah Postgraduate Medical Centre (JPMC) using the Patient Health Questionnaire-9 (PHQ-9).

Methodology: This cross-sectional comparative study was conducted at JPMC and NICH using non-probability consecutive sampling to recruit 166 women, with 83 in each prepartum and postpartum group. Women aged 18 years or older, either pregnant or within one year postpartum, were included. Data were collected through a structured interviewer-administered questionnaire, and depression was assessed using the PHQ-9. Data were analysed in SPSS 26 using descriptive statistics and the Chi-square test at a 5% significance level.

Results: The mean age was similar between prepartum (29.24 ± 6.40 years) and postpartum women (28.37 ± 6.45 years; p = 0.386). Prepartum women had significantly higher PHQ-9 scores (11.93 ± 6.08) than postpartum women (9.57 ± 7.51; p = 0.027). Depression severity differed significantly (p = 0.021), with moderate to severe depression more common in prepartum women (65.4% vs. 49.4%), while postpartum women more often had no depression (33.7% vs. 12%).

Conclusion: The study found that prepartum women experienced significantly higher depressive symptoms than postpartum women, as reflected by higher PHQ-9 scores and greater proportions of moderate to severe depression. These findings highlight the need for routine screening and timely support for women during pregnancy, when depressive symptoms appear more pronounced. Integrating structured assessments like the PHQ-9 into antenatal care may improve early identification and intervention.

Keywords: Depression, Peripartum period, Mental health screening, Patient health questionnaire (PHQ-9), Postpartum period

INTRODUCTION

Pregnancy and the postpartum period involve substantial physiological, emotional, and social changes that can increase a woman's susceptibility to mental health problems, particularly depressive symptoms. Perinatal depression, which includes depression occurring during pregnancy or within the first year after childbirth, is widely recognized as a serious global health concern because of its negative effects on maternal well-being, caregiving capacity, and the developmental outcomes of infants[1]. In low-income and resource-limited settings, additional challenges such as psychosocial stressors, socioeconomic hardship, and cultural stigma further elevate the risk of depressive symptoms among women, as demonstrated by evidence from South Asian and similar populations[2].

International research consistently reports that perinatal depression affects a significant proportion of women, with prevalence estimates ranging from 20% to 30% during pregnancy and 17% to 25% after childbirth. Higher rates are commonly observed among vulnerable groups, including immigrant women and those experiencing economic disadvantage[3-5]. These trends highlight the need for timely and accurate identification of depressive symptoms. Screening tools such as the Patient Health Questionnaire-9 (PHQ-9) have gained strong support because of their diagnostic usefulness, ease of administration, and reliable performance across different cultural and clinical contexts[6-8]. Evidence from low-resource settings, including studies from Kenya, further supports the feasibility and validity of using the PHQ-9 among both pregnant and postpartum women[9]. Additionally, perinatal depression has been linked to adverse pregnancy outcomes, reinforcing the importance of early detection and intervention[10].

Although much has been written about perinatal depression, limited research has directly compared the severity of depressive symptoms between prepartum and postpartum women within the same clinical environment. This distinction is important because the psychological, social, and physical demands placed on women differ before and after childbirth. Generating locally relevant comparative evidence can support the development of effective screening strategies, guide targeted interventions, and strengthen maternal mental health services in low-resource healthcare settings where tools like the PHQ-9 are practical and suitable for routine use.

METHODOLOGY

This cross-sectional comparative study was conducted over a defined study period at Jinnah Postgraduate Medical Centre (JPMC) and the National Institute of Child Health (NICH) in Karachi, Pakistan, with two groups of women recruited to represent prepartum and postpartum populations. The prepartum group included pregnant women attending the Obstetrics and Gynaecology Ward at JPMC, whereas the postpartum group comprised women who had recently delivered and were visiting NICH for routine infant vaccination. Women aged 18 years or older, either currently pregnant or within one year postpartum, were eligible for inclusion; those with known psychiatric illness, chronic debilitating medical conditions, or unwillingness to participate were excluded to minimize confounding. A non-probability consecutive sampling

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technique was used to enrol all eligible participants, yielding a total sample size of 166 women (83 in each group), calculated using the World Health Organization sample size calculator based on an 18% expected prevalence of depressive symptoms, a 95% confidence level, and a 6% margin of error. Ethical approval was obtained from the Institutional Review Board of Jinnah Sindh Medical University, and all procedures adhered to internationally recognized ethical standards for human research. Data were collected using a structured, interviewer-administered questionnaire capturing sociodemographic, clinical, and obstetric information, and depression was assessed using the Patient Health Questionnaire-9 (PHQ-9), which evaluates symptom frequency over the preceding two weeks. Interviews were conducted privately by trained female data collectors to ensure standardization, confidentiality, and reduction of interviewer bias. PHQ-9 total scores were calculated and categorized according to established severity criteria to compare depressive symptoms between prepartum and postpartum women. Data were analysed using SPSS version 26, with descriptive statistics used to summarize participant characteristics, and Chi-square tests applied to compare depression severity between groups, considering $p \leq 0.05$ as statistically significant.

RESULTS

Table I presents the baseline and clinical characteristics of 166 study participants, comparing prepartum (n=83) and postpartum (n=83) women. The mean age and parity were comparable between both groups, with prepartum women having a mean age of 29.24 ± 6.40 years and parity of 1.70 ± 1.35, while postpartum women had a mean age of 28.37 ± 6.45 years and parity of 1.88 ± 1.42, showing no statistically significant differences (p=0.386 and p=0.403, respectively). However, a statistically significant difference was observed in PHQ-9 depression scores, where prepartum women exhibited higher depressive symptoms (11.93 ± 6.08) than postpartum women (9.57 ± 7.51; p=0.027). Educational status also showed a highly significant association (p=0.0001), with a greater proportion of illiterate participants in the prepartum group (24.1%) compared to the postpartum group (4.8%), whereas secondary education was more common among postpartum women (55.4% vs. 25.3%). Socioeconomic status did not differ significantly (p=0.828), with an equal proportion of low socioeconomic status (42.2%) in both groups. Similarly, mode of delivery showed no significant difference (p=0.535), with comparable distributions of spontaneous vaginal delivery and caesarean section. The history of miscarriage was also not significantly different between prepartum (15.7%) and postpartum women (24.1%; p=0.173).

Table II compares the distribution of depressive symptoms between prepartum and postpartum mothers using the PHQ-9 scale. For the symptom "Little interest or pleasure in doing things," both groups exhibited similar response patterns, with no significant difference (p=0.329). However, a significant difference was observed in the symptom "Feeling down, depressed, or hopeless" (p=0.001), where 36.1% of prepartum mothers reported experiencing it nearly every day compared to only 13.3% in the postpartum group, while postpartum mothers more frequently reported experiencing symptoms on "more than half the days" (33.3% vs. 14.5%). Regarding "Trouble falling or staying asleep or sleeping too much," both groups showed comparable responses (p=0.956), with 42.2% in each group reporting symptoms nearly every day. A significant difference was noted in "Feeling tired or having little energy" (p=0.020), where prepartum mothers reported this symptom nearly every day more frequently (59%) compared to postpartum mothers (37.3%), while postpartum participants more commonly reported lesser frequency responses. For "Poor appetite or overeating," no significant difference was observed (p=0.124), though postpartum mothers reported "not at all" more frequently (33.7% vs. 20.5%). Feelings of self-worth issues ("Feeling bad about yourself…") did not show a significant association (p=0.771), with similar response patterns across groups. The symptom "Trouble concentrating" also did not show a significant difference (p=0.236), although a higher proportion of postpartum mothers reported no difficulty (61.4% vs. 45.8%). A highly significant difference was seen for "Moving or speaking slowly or being fidgety or restless" (p=0.001), with 59% of postpartum mothers reporting no symptoms compared to only 34.9% in the prepartum group, whereas prepartum mothers reported higher frequencies of nearly everyday symptoms (25.3% vs. 4.8%). Finally, "Thoughts of self-harm or suicidal ideation" showed a significant difference (p=0.017), with more postpartum mothers reporting these thoughts "more than half the days" (13.3% vs. 1.2%), while prepartum mothers more frequently reported "not at all" (81.9% vs. 72.3%).

Table III presents the comparison of depression severity between prepartum, and postpartum mothers based on PHQ-9 score categories. The findings indicate a statistically significant difference in overall depression severity between the two groups (p=0.021). A notably higher proportion of postpartum mothers had no depression (33.7%) compared to prepartum mothers (12%), suggesting better psychological well-being in the postpartum group. Conversely, prepartum mothers exhibited higher proportions across all depressive severity categories. Mild depression was reported by 21.7% of prepartum mothers versus 16.9% of postpartum mothers, while moderate depression was present in 32.5% and 27.7% of prepartum and postpartum mothers, respectively. Moderately severe depression was more prevalent in the prepartum group (22.9%) as compared to postpartum (14.5%). Severe depression, the most intense category, was also slightly more common among prepartum mothers (10.8%) than postpartum mothers (7.2%). These findings suggest that depressive symptoms were more pronounced and severe in prepartum mothers compared to postpartum mothers.

Table I: Baseline and Clinical Characteristics of Study Participants (n=166)				
Characteristics		**Groups**		**P-Value**
		Prepartum (n=83)	**Postpartum** (n=83)	
Age in years, Mean ± SD		29.24 ± 6.40	28.37 ± 6.45	0.386
Parity, Mean ± SD		1.70 ± 1.35	1.88 ± 1.42	0.403
PHQ9 Level Score, Mean ± SD		11.93 ± 6.08	9.57 ± 7.51	0.027*
Educational Status	Illiterate	20 (24.1)	4 (4.8)	0.0001*
	Primary	20 (24.1)	17 (20.5)	
	Secondary	21 (25.3)	46 (55.4)	
	Graduate	22 (26.5)	16 (19.3)	
Socioeconomic Status	Low	35 (42.2)	35 (42.2)	0.828
	Middle	21 (25.3)	24 (28.9)	
	High	27 (32.5)	24 (28.9)	
Mode of Delivery	SVD	40 (48.2)	44 (53.0)	0.535
	C-Section	43 (51.8)	39 (47.0)	
History of Miscarriage		13 (15.7)	20 (24.1)	0.173

Table II: Comparison of Prepartum and Postpartum Depression in Mothers by Using PHQ-9						
Depression Scale (PHQ-9)		**Not at all**	**Several days**	**More than half the day**	**Nearly every day**	**P-Value**
Little interest or pleasure in doing things	Pre-partum	35 (42.2%)	13 (15.7%)	14 (16.9%)	21 (25.3%)	0.329
	Post-partum	42 (50.6%)	16 (19.3%)	13 (15.7%)	12 (14.5%)	
Feeling down, depressed, or hopeless.	Pre-partum	27 (32.5%)	14 (16.9%)	12 (14.5%)	30 (36.1%)	0.001*
	Post-partum	31 (37.3%)	13 (15.7%)	28 (33.3%)	11 (13.3%)	
Trouble falling or staying asleep or sleeping too much.	Pre-partum	29 (34.9%)	12 (14.5%)	7 (8.4%)	35 (42.2%)	0.956
	Post-partum	27 (32.5%)	12 (14.5%)	9 (10.8%)	35 (42.2%)	
Feeling tired or having little energy	Pre-partum	8 (9.6%)	8 (9.6%)	18 (21.7%)	49 (59%)	0.020*
	Post-partum	20 (24.1%)	10 (12%)	22 (26.5%)	31 (37.3%)	
Poor appetite or overeating.	Pre-partum	17 (20.5%)	22 (26.5%)	12 (14.5%)	32 (38.6%)	0.124
	Post-partum	28 (33.7%)	17 (20.5%)	16 (19.3%)	22 (26.5%)	

Feeling bad about yourself, or that you are a failure, or have let yourself or your family down.	Pre-partum	27 (32.5%)	28 (33.7%)	15 (18.1%)	13 (15.7%)	0.771
	Post-partum	33 (39.8%)	23 (27.7%)	14 (16.9%)	13 (15.7%)	
Trouble concentrating on things, such as reading the newspaper or watching television.	Pre-partum	38 (45.8%)	20 (24.1%)	14 (16.9%)	11 (13.3%)	0.236
	Post-partum	51 (61.4%)	14 (16.9%)	9 (10.8%)	9 (10.8%)	
Moving or speaking so slowly that other people could have noticed. Or the opposite –being so fidgety or restless that you have been moving around a lot more than usual.	Pre-partum	29 (34.9%)	21 (25.3%)	12 (14.5%)	21 (25.3%)	0.001*
	Post-partum	49 (59.0%)	21 (25.3%)	9 (10.8%)	4 (4.8%)	
Thoughts that you would be better off dead, or of hurting yourself in some way.	Pre-partum	68 (81.9%)	11 (13.3%)	1 (1.2%)	3 (3.6%)	0.017*
	Post-partum	60 (72.3%)	7 (8.4%)	11 (13.3%)	5 (6.0%)	

Table III: Comparison of Severity of Depression in Prepartum and Postpartum Mothers (PHQ-9)

PHQ-9	Pre-Partum	Post-Partum	P-Value
None (0~4)	10 (12%)	28 (33.7%)	0.021*
Mild depression (5~9)	18 (21.7%)	14 (16.9%)	
Moderate depression (10~14)	27 (32.5%)	23 (27.7%)	
Moderately severe depression (15~19)	19 (22.9%)	12 (14.5%)	
Severe depression (20~27)	9 (10.8%)	6 (7.2%)	

DISCUSSION

The present study examined the severity of depression among prepartum and postpartum women using the PHQ 9 and found that prepartum women experienced significantly higher depressive symptoms than postpartum women, reflected by a higher mean PHQ 9 score of 11.93 compared with 9.57. These values indicate clinically meaningful differences because scores of 10 and above on the PHQ 9 generally suggest moderate depressive symptoms that require further evaluation. The higher levels of depression in the prepartum group are consistent with previous work showing that pregnancy often carries a substantial emotional and physiological burden, which increases vulnerability to psychological distress. Prior studies from South Asia demonstrated similarly elevated depressive symptoms in pregnant women facing socioeconomic hardship and limited social support[2]. International literature also supports these findings, as Woody and colleagues reported higher antenatal depression prevalence compared with postpartum prevalence across multiple populations[4]. Shorey and associates noted antenatal depression rates between 20 and 30 percent in Asian countries[5], comparable to the proportion of prepartum women in our study who fell into the moderate and severe depression categories. The higher frequency of several key depressive symptoms among prepartum women in our study, including depressed mood, low energy, and psychomotor changes, reflects the clinical pattern described in earlier validation studies of the PHQ 9[6]. These symptom specific differences also align with evidence from Velloza and colleagues, who observed higher PHQ 9 scores among pregnant women compared with postpartum women in a Kenyan cohort[9]. Findings from the past five to seven years continue to emphasize this trend. Gelaye and collaborators found that antenatal depression prevalence exceeded 25 percent in low- and middle-income populations where psychosocial adversity was common[11]. A Brazilian study reported a mean antenatal PHQ 9 score of 10.8, which closely matches our prepartum mean score of 11.93[12]. Research from China documented antenatal depression rates near 28 percent compared with 18 percent postpartum, a pattern consistent with the severity differences observed in our results[13]. A South Asian review reported that nearly one third of pregnant women screened positive for clinically significant depression, compared with approximately one fifth during the postpartum period[14]. A Canadian longitudinal study further demonstrated that antenatal depressive symptoms are strong predictors of postpartum depression, underscoring the importance of identifying elevated PHQ 9 scores during pregnancy[15]. A widely cited review found that antenatal depression prevalence

ranged from 22 to 34 percent in global samples, consistent with the severity distribution seen in our prepartum group[16]. In the United States, Silverman and colleagues reported mean antenatal PHQ 9 scores of approximately 12 in low-income urban populations, which is remarkably similar to our findings[17]. Notably, postpartum women in our study had higher percentages of no depression yet still exhibited concerning rates of suicidal thoughts. This observation is supported by recent epidemiological reports indicating that suicidal ideation, although less common overall, remains a significant concern in the postpartum period[18]. The strengths of this study include the use of a validated screening tool, standardised data collection procedures, and inclusion of participants from two major public sector hospitals that serve diverse communities. The comparative approach enhances the interpretability of differences between the two groups. However, several limitations should be acknowledged. The cross-sectional comparative design restricts the ability to determine causal relationships between pregnancy status and depressive symptoms. Consecutive sampling may limit generalisability to the broader population. The PHQ 9 is a screening instrument rather than a diagnostic measure, and structured clinical interviews could provide more definitive diagnoses. Additionally, psychosocial factors such as marital conflict, domestic stress, inadequate support, and unplanned pregnancy, which may influence depression, were not assessed. Despite these limitations, the study highlights the increased vulnerability of prepartum women to depressive symptoms and reinforces the need for early and routine screening during pregnancy. Integrating simple tools such as the PHQ 9 into antenatal care may improve early detection and timely referral, ultimately enhancing maternal and neonatal outcomes.

CONCLUSION

The study found that prepartum women experienced significantly higher depressive symptoms than postpartum women, as reflected by higher PHQ-9 scores and greater proportions of moderate to severe depression. These findings highlight the need for routine screening and timely support for women during pregnancy, when depressive symptoms appear more pronounced. Integrating structured assessments like the PHQ-9 into antenatal care may improve early identification and intervention.

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Authors' Contributions: All authors took part in this study to an equal extent. **Aheed B:** Conceived the study idea, developed the methodology, supervised data collection, and drafted the initial manuscript. **Yasmin H:** Provided expert guidance, supervised the study process, reviewed the study design, and critically revised the manuscript. **Khan BA:** Assisted in data collection, contributed to the literature review, and supported manuscript writing. **Siddiqui MS:** Participated in data collection, assisted in the literature review, and contributed to manuscript drafting. **Hussain SW:** Contributed to data analysis and interpretation, supported the literature review, and assisted in manuscript organization. **Daaniyal MR:** Assisted in data analysis, participated in proofreading, and contributed to final manuscript editing.

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