

ORIGINAL RESEARCH

OBSTETRIC ANESTHESIA

Antenatal depression as an emerging multidisciplinary challenge in obstetric, peri-operative, and critical care medicine

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ABSTRACT

Background & Objective: Antenatal depression is increasingly recognized as a significant contributor to adverse maternal, fetal, peri-operative, and critical care outcomes during pregnancy. The objective of this study was to determine the prevalence of antenatal depression and evaluate its clinicodemographic determinants among pregnant women attending a tertiary care hospital, with emphasis on its implications for obstetric, peri-operative, and critical care practice.

Methodology: The cross-sectional study was carried out at Department of Obstetrics and Gynecology, Unit IV, Fatima Memorial Hospital, Lahore. Patients who were pregnant with gestational age values 12-38 weeks and aged 18-40 years were enrolled using non-probability consecutive sampling, however patients with neurological or psychiatric symptoms and those who were already taking medications for depression were excluded. Information regarding demographic and obstetric variables were recorded. The Beck depression inventory (BDI) was used to measure antenatal depression, and a score above 11 was regarded as a sign of depression. Data were computed with SPSS version 20. Statistical tests Chi-square test, $p \leq 0.05$ was taken as significant.

Results: The overall mean age of participants was 26.24 ± 4.46 years old, and the gestational age mean of 24.81 ± 6.50 weeks. The mean BDI score was 8.86 ± 2.65 . It was found that 11.2% of participants were experiencing antenatal depression. Statistically significant correlations between parity, educational status and BDI score with antenatal depression and age were found ($P < 0.05$), however no statistically significant existed between gestational age and antenatal depression ($P > 0.05$).

Conclusion: Antenatal depression is widespread among pregnant women, and it is affected by various demographic and obstetric factors. Frequent screening of mothers and early intervention are the keys to improve maternal mental health and pregnancy outcomes.

Keywords: Antenatal Depression, Prenatal Care, Beck Depression Inventory, Maternal Health, Risk Factors

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1. INTRODUCTION

Antenatal depression is a common yet under-reported mental health disorder in women during pregnancy, with the prevalence between 10% and 25% worldwide.¹ Research has shown that the negative obstetric outcomes of antenatal depression include preterm birth, low birth weight, a higher risk of operative birth, and a lack of maternal self-care.² Also, it can pre-dispose women to postpartum depression and disfigure mother-infant attachment leading to long-term development and behavioral problems in children.³

Antenatal depression has a considerable influence on the mother and neonatal outcome which ultimately effects the overall population. Mental health during pregnancy is not usually considered in most developing countries, and is attributed to poor mental health during pregnancy and limited screening protocols in the antenatal care units.⁴⁻⁵ Timely detection of antenatal depression is important to intervene early, resulting in better pregnancy outcomes and less psychosocial impact on the mother and child.⁶ Integration of mental health assessment in an ordinary antenatal service can significantly help in solving this silent problem.⁷

Although the importance of maternal mental health is increasingly recognized, the available evidence on the prevalence and correlates of antenatal depression in obstetric women seeking tertiary care services is limited. Differences in socio-demographic characteristics, cultural norms, and access to healthcare require study-specific studies for better comprehension.⁸

Thus, the aim of the current study was to find out the prevalence of antenatal depression among women visiting the antenatal clinic with a tertiary care hospital and to evaluate its relationship with the demographic and obstetric variables.

2. METHODOLOGY

This study was carried out in the Department of Obstetrics and Gynaecology, Unit IV, Fatima Memorial Hospital, Lahore, a tertiary care teaching hospital within a period of six months from October 2022 to April 2023 (FMH-0210/2022). All the subjects gave written informed consent, and patient information was kept confidential. Using the OpenEpi calculator, a sample size was estimated by assuming a prevalence rate of 7% of antenatal depression (95% confidence interval and margin of error 3%), and the required sample size was found to be 278 individuals. Qualified subjects were recruited using a non-probability consecutive sampling technique.⁹

The study included pregnant females aged 18 to 40 years having routine antenatal check-up with gestational age of 12 to 38 weeks, according to last menstrual period.

Females unwilling to participate, or had a history of neurological or psychiatric disorders, or had been on medication against depression were excluded. The demographic and obstetric factors such as age, gestational age, parity and educational status were documented on a structured proforma. The Beck Depression Inventory (BDI) was used to assess antenatal depression in all participants. All participants were interviewed, and scoring was done as per the standard BDI protocol, where a BDI score above 11 reflected antenatal depression. Depressed participants were counseled and referred to other clinical care as per the clinical procedures.

IBM SPSS Statistics (version 20.0) was used for data analysis.¹⁰ Age, gestational age, and BDI score were described using mean $\pm$ standard deviation, whereas frequencies and percentages were used for categorical variables such as antenatal depression during pregnancy, parity, and educational status. To measure effect modifiers, data were stratified on the basis of age, gestational age, parity, educational status, and BDI score. The Chi-square test was used to test the associations between antenatal depression and categorical variables respectively after stratification and p-value ≤ 0.05 was treated as statistically significant.

3. RESULTS

The study used data from 278 patients for the synthesis of evidence. The baseline demographic and obstetric characteristics of participants are presented in Table 1.

Table 1: Baseline characteristics of study participants			
Variable	Category	Percentage (%)	Mean $\pm$ SD
Age (years)	18–23	34.2	26.24 $\pm$ 4.46
	24–29	39.9	
	30–37	25.9	
Gestational Age (weeks)	12.1–20	24.8	24.81 $\pm$ 6.50
	20.1–29	39.6	
	29.1–38	35.6	
Parity	0	10.1	2.06 $\pm$ 1.31
	1–3	76.6	
	4–7	13.3	
Educational Status	Primary	1.1	—
	Middle	2.9	
	Matric	58.6	
	FA / bove	37.4	

Table 2: Distribution of BDI Score and Antenatal Depression (n = 278)				
Variable	Category	Frequency (n)	Percentage (%)	Mean ± SD
BDI Score	2–7	74	26.6	8.86 ± 2.65
	8–12	180	65.8	
	13–18	24	8.6	
Antenatal Depression	Yes	31	11.2	–
	No	247	88.8	
Antenatal depression was defined by a BDI score of over 11. BDI = Beck Depression Inventory. SD = Standard Deviation. Not applicable values in the data are represented by -.				

Most of the subjects (39.9%) fell within the age range of 24–29 years. The mean gestational age was 24.81 ± 6.50 weeks with more than half of the women in the second trimester (39.6%). Most of them (76.6%) had parity of 1–3, and had matric level education (58.6%). The frequency of antenatal depression and the distribution of Beck Depression Inventory (BDI) scores in the study population is represented in Table 2.

Majority of the women (65.8%) had BDI scores of between 8–12, and 11.2% of the participants were experiencing antenatal depression. Table 3 shows the relationship between antenatal depression and age, gestational age, parity, and educational status. Antenatal depression was statistically found to be associated with age, parity, and educational status ($P \leq 0.05$). As can be seen in Figure 1, there was a relationship between antenatal depression and major clinical and demographic and obstetric parameters in pregnant women who were

included in the study. Antenatal depression had a significant relationship with maternal demographic burden with higher frequencies seen in women aged between 30 and 37 years and multiparity (4–7). There were relatively less differences in depression prevalence

across the gestational age categories. The figure also shows that most participants did not have depression and clinically relevant sub-groups with higher levels of depression symptoms. These results highlight the potential value of early screening of the psychological status in multi-disciplinary obstetric, peri-operative and critical care environments.

A very strong relationship was found ($p = 0.001$) with most of the depressed patients having higher BDI scores (13–18). Table 5 points out the antenatal depression's implications and possible peri-operative and critical care implications in obstetric patients. The results highlight the importance of the multidisciplinary nature of maternal psychological well-being in anesthetic care, peri-delivery care, postoperative care and intensive care planning.

Table 4 illustrates how the categories of BDI scores are related to antenatal depression.

Table 3: Association of antenatal depression with demographic variables						
Variable	Category	Depression Yes (n)	Depression No (n)	χ ²	df	p-value
Age (years)	18–23	3	92	48.266	2	0.001
	24–29	4	107			
	30–37	24	48			
Gestational Age (weeks)	12–20	7	62	0.457	2	0.796
	20.1–29	14	96			
	29.1–38	10	89			
Parity	0	3	25	90.976	2	0.001
	1–3	7	206			
	4–7	21	16			
Educational Status	Primary	6	98	28.698	3	0.001
	Middle	20	143			
	Matric	2	6			
	FA & above	3	–			
Chi-square (χ ²) test was applied for comparison between groups. p-value less than 0.05 was taken statistically significant. df = Degrees of freedom. χ ² = Chi-square value. Not applicable values in the data are represented by -						

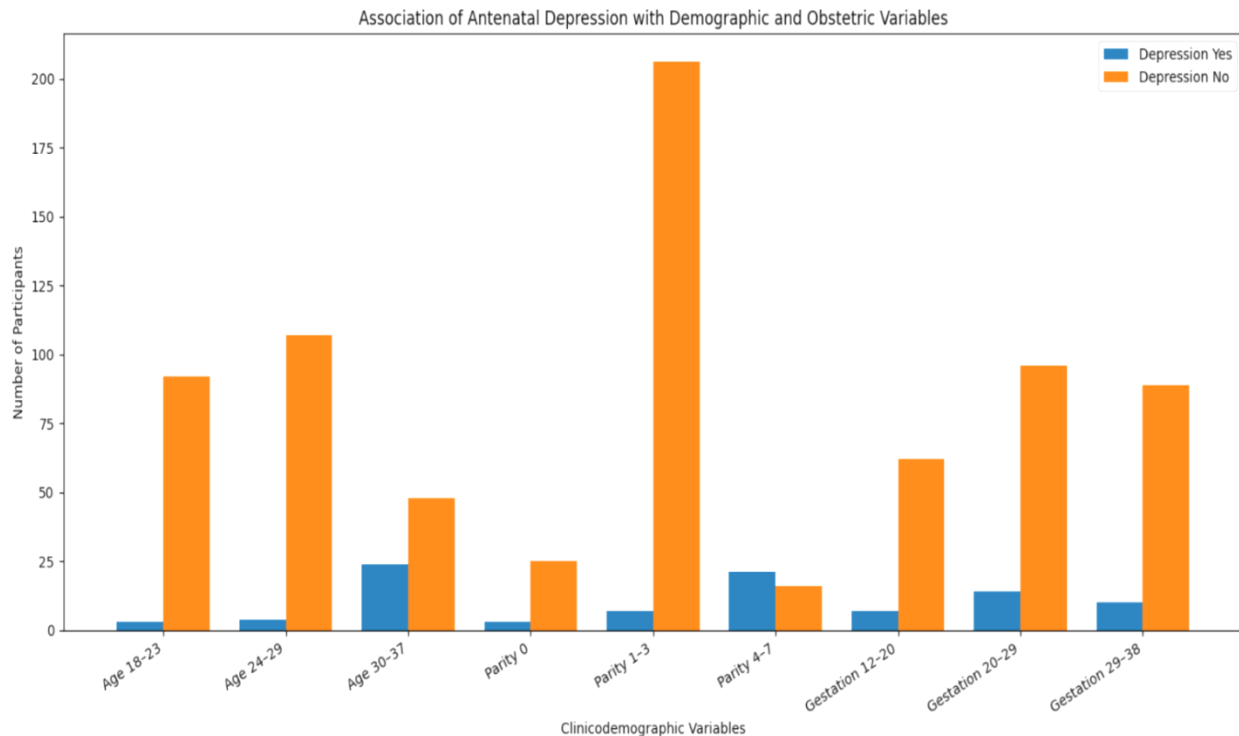


Figure 1: relationship between antenatal depression and major demographic/obstetric variables.

Table 4: Association of antenatal depression with BDI Score

BDI Score	Depression Yes (n)	Depression No (n)	χ^2	df	P-value
2-7	0	74	191.170	2	0.001
8-12	8	172			
13-18	23	1			

Association was evaluated by chi-square (χ^2) test. p-value less than 0.05 was taken statistically significant. df = Degrees of freedom. BDI = Beck Depression Inventory

4. DISCUSSION

The current study assessed the occurrence rate (11.2%) of antenatal depression in pregnant women within a tertiary care hospital. The average age of the population being studied was 26.24 ± 4.46 years and most of the women were aged between 24-29 years. Most of the participants were in the second trimester with an average gestational age of 24.81 ± 6.50 weeks. The mean BDI score was 8.86 ± 2.65 . Antenatal depression showed statistically significant association with age, parity, educational status and BDI score ($p < 0.05$) but not with gestational age ($p > 0.05$). Depression was especially prevalent in women with greater parity and in the older group.

The incidence of antenatal depression recorded in the current study (11.2%) which is low as compared to those reported in local and global literature.¹¹ The moderate prevalence reported in this the study can be explained by dissimilarities in the socio-cultural processes, the mechanisms of support among families, and the implementation of certain diagnostic cut-offs of BDI.¹²

This study, in-line with reported literature, established maternal age and parity to be important predictors of antenatal depression.¹³ High ages of motherhood and high parity can increase the psychological burden through greater responsibilities, financial pressure and care giving burden, thus inclining women to develop symptoms of depression.

In addition, there is a high level of correlation between the level of education and prenatal depression.¹⁴ Research has commonly attributed low levels of education with a low level of health awareness, lack of access to health services, and susceptibility to psychosocial stress factors. Interestingly, gestational age did not significantly correlate with antenatal depression in this study, however, it contradicts published data where higher rates of depression were observed in later

Table 5: Potential peri-operative and critical care implications of antenatal depression in obstetric patients

Clinical Domain	Observed Study Finding	Potential Anesthesia / Critical Care Relevance
Psychological Stress Burden	11.2% prevalence of antenatal depression	Increased perioperative anxiety and altered maternal stress response during obstetric procedures
Elevated BDI Scores	Majority of depressed patients had BDI scores 13–18	Higher risk of pain sensitization, poor analgesic response, and delayed postoperative recovery
Advanced Maternal Age	Significant association between age and depression (P = 0.001)	Greater vulnerability to peri-delivery hemodynamic instability and obstetric complications
Multiparity	Strong association between parity and depression (P = 0.001)	Increased maternal physiological exhaustion and perioperative care complexity
Educational Status	Significant association with depression (P = 0.001)	Possible delays in psychological reporting, counseling access, and multidisciplinary intervention
Second/Third Trimester Burden	Majority participants were beyond 20 weeks gestation	Increased anesthetic considerations due to advanced physiological and cardiopulmonary adaptations
Maternal Mental Health Burden	Persistent depressive symptoms during pregnancy	Potential influence on ICU admission risk, maternal morbidity, and prolonged hospitalization

BDI = Beck Depression Inventory. Clinical implications were interpreted from statistically significant study findings and contemporary obstetric anesthesia literature.

trimesters.^{15,16} These disparities could be attributed to the heterogeneity among study design, sample size, and cultural attitudes towards pregnancy. Higher BDI scores are strongly correlated with antenatal depression which approves the credibility of BDI as a screening tool.¹⁷

Despite its strengths this study has certain limitations. Being a single-center study, the findings may not be generalizable to the broader population. The use of a cross-sectional design limits the ability to establish causal relationships between risk factors and antenatal depression. Additionally, reliance on a screening tool rather than a clinical diagnostic interview may lead to underestimation or overestimation of true prevalence. Future studies should consider multicenter longitudinal designs with larger sample sizes and incorporate comprehensive psychiatric evaluations. Moreover, exploring psychosocial variables such as partner support, economic status, and cultural influences in greater depth would provide a more holistic understanding of antenatal depression and help in designing targeted interventions for maternal mental health.

5. CONCLUSION

There was a considerable prevalence of antenatal depression among pregnant women who visited the antenatal clinic. It had significant correlations with maternal age, parity, and educational status. Antenatal care must be coupled with routine screening with reliable instruments like the Beck Depression Inventory. Maternal well-being and pregnancy outcomes can be improved with early detection and t

timely intervention, which underscores the need of mental health services during obstetric care.

6. Authors' Contributions

MJ, SH contributed majorly to the study.

All others Authors Contributed equally significant as per all ICMJE roles.

7. Ethical Statement

This study was carried out in the Department of Obstetrics and Gynaecology, Unit IV, Fatima Memorial Hospital, Lahore, a tertiary care teaching hospital within a period of six months from October 2022 to April 2023 (FMH-0210/2022).

8. Conflict of Interest

None

9. Source of Funding

None

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