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Expert Opinion Article

PHQ-9 Based Screening Of Psychiatric Illness In The Antenatal Period And Its Progression – A Cross Sectional, Prospective Study At A Tertiary Care Centre In Central India

Dr. Manjushree Waikar[1], Dr. Saraswati Dhulgande[2], Dr. Mansi Shrigiriwar[3*]

[1]Professor and Head. Department of Obstetrics and Gynaecology, Government Medical College, Nagpur, Maharashtra, India
[2]Post Graduation Student Department of Obstetrics and Gynaecology, Government Medical College, Nagpur, Maharashtra, India
[3*]Associate Professor. Department of Obstetrics and Gynaecology, Government Medical College, Nagpur, Maharashtra, India

***Corresponding Author:** Dr. Mansi Shrigiriwar
*Associate Professor, Department of Obstetrics and Gynaecology, Government Medical College, Nagpur, Maharashtra 440003, India, Email: muktai2008@gmail.com

ABSTRACT

Introduction: Antenatal psychiatric disorders, particularly depression and anxiety, are among the most prevalent complications of pregnancy and can have significant short- and long-term consequences for both maternal and fetal health.

Aims & Objectives: To screen pregnant women using PHQ-9 for high-risk psychiatric symptoms and confirm diagnoses through further evaluation, aiming for early detection and management to improve maternal and fetal outcomes.

Materials & Methods: This prospective, observational, hospital-based study was conducted at Government Medical College, Nagpur, India. The total study duration was 18 months, divided into three distinct phases for systematic data collection and analysis. The study population comprised all pregnant women attending the antenatal care (ANC) outpatient department (OPD) during the study period, with a total sample size of 141 participants.

Result: In our study of 141 antenatal women, most were aged 26–30 years, married, and from lower or lower-middle socioeconomic backgrounds. PHQ-9 screening showed 32.6% had minimal, 44.7% mild, 16.3% moderate, 5.7% moderately severe, and 0.7% severe depression. Depressive symptoms were significantly more common among women from lower socioeconomic classes. These findings highlight a high prevalence of antenatal depression, emphasizing the need for routine PHQ-9 screening and early mental health intervention during pregnancy.

Conclusion: The study underscores that antenatal depression is common, especially among women with lower socioeconomic status, limited education, or rural residence. Most exhibited mild to moderate symptoms such as fatigue, poor sleep, and low mood, highlighting the need for early detection through routine PHQ-9 screening, counseling, and integrated mental health support to improve maternal and fetal outcomes.

Keywords: Antenatal Depression, PHQ-9 Screening, Pregnancy, Maternal Mental Health, Psychiatric Illness, Socioeconomic Factors.

INTRODUCTION

Antenatal psychiatric disorders, particularly depression and anxiety, are among the most prevalent complications of pregnancy and can have significant short- and long-term consequences for both maternal and fetal health [1,2]. Studies suggest that approximately 10–20% of pregnant women experience clinically significant depressive symptoms, while anxiety disorders may affect up to 15% of this population, often coexisting with depression and complicating maternal care [3,4]. Untreated antenatal psychiatric illnesses have been associated with adverse obstetric outcomes including preterm birth, low birth weight, intrauterine growth restriction, and increased risk of postpartum depression, as well as long-term cognitive and behavioral impacts on offspring [5,6]. Early detection and intervention are therefore critical, and standardized screening tools have become essential components of routine antenatal care. Among these, the Patient Health Questionnaire-9 (PHQ-9), a brief self-administered instrument assessing the severity of depressive symptoms, has demonstrated high validity and reliability in diverse antenatal populations, with sensitivity and specificity values consistently above

80% for detecting depression [7,8]. The PHQ-9 evaluates nine DSM-IV criteria for major depressive disorder, facilitating not only the identification of clinically relevant depressive symptoms but also monitoring their progression over time, which is crucial for timely therapeutic interventions [9]. While the PHQ-9 primarily focuses on depressive symptoms, it may underestimate anxiety-related manifestations, which are also common during pregnancy; therefore, it is often used in combination with other scales such as the Edinburgh Postnatal Depression Scale (EPDS) to provide a more comprehensive assessment of perinatal mental health [10]. Screening strategies recommend multiple assessments at key points during gestation—typically during the first trimester, mid-pregnancy, and late pregnancy—to capture changes in symptom severity, recognize emerging psychiatric conditions, and allow prompt referral for treatment when indicated. Longitudinal monitoring using the PHQ-9 allows clinicians to track symptom trajectories, distinguishing transient mood fluctuations from persistent or worsening psychiatric conditions, thereby informing individualized care plans. Integrating routine PHQ-9 screening into antenatal practice also enhances awareness among healthcare providers and patients, reduces stigma, and promotes early psychosocial support or pharmacological intervention as appropriate, ultimately improving maternal functioning and fetal outcomes . Furthermore, the adoption of PHQ-9-based screening programs has been shown to increase detection rates, facilitate timely interventions, and reduce the burden of untreated depression during pregnancy, particularly in low-resource settings where psychiatric evaluation may otherwise be limited. Recent studies have emphasized the importance of culturally adapted versions of the PHQ-9, ensuring linguistic and contextual relevance, which enhances screening accuracy and patient engagement. Overall, systematic PHQ-9-based screening represents a feasible, reliable, and scalable approach to identifying antenatal psychiatric disorders, monitoring their progression, and implementing early interventions, thereby safeguarding maternal mental health and optimizing pregnancy outcomes [1–10].

MATERIALS AND METHODS

Study Design: Prospective, observational, hospital-based study

Place of Study: The research was conducted at the Government Medical College, Nagpur, India.

Study Duration: The study spanned 18 months in total and was divided into three distinct phases for systematic data collection and analysis.

Study Population: The study population included all pregnant women visiting the ANC OPD during the study period.

Sample Size: 141 participants

- Written informed consent was obtained from all participants prior to enrollment in the study, after providing detailed information regarding the study objectives, procedures, and potential risks. Participation was entirely voluntary, and confidentiality was strictly maintained.

Study Variables: Demographic Parameters **(**Age group, Marital status, Education and Occupation etc.)

Inclusion Criteria: Women with confirmed pregnancy (validated by ultrasonography), those attending ANC during the study period, and women willing to provide informed written consent.

Exclusion Criteria: Women with a history of severe psychiatric disorders prior to pregnancy (e.g., schizophrenia, bipolar disorder, psychosis), substance abuse (alcohol, illicit drugs, or misuse of prescription medicines), organic brain disorders (such as dementia, traumatic brain injury, or demonstrativeness conditions), prior use of antidepressants before conception, and those with a history of suicidal attempts or self-harm.

Ethical clearance for the study was obtained from the Institutional Ethics Committee. Informed written consent was taken from all participants prior to inclusion in the study.

Statistical Analysis: Data were analyzed using descriptive statistics (frequencies, percentages, mean ± SD) and the Chi-square test to assess associations between categorical variables, including PHQ-9 depression severity and socioeconomic factors, with $p < 0.05$ considered significant.

RESULT

Table 1: Demographic and Socioeconomic Profile of the Study Population

		Frequency (n)	Percentage (%)	P -Value
Age group in years	18-20	6	4.25	< .00001
	21-25	55	39	
	26-30	60	42.55	
	31-35	20	14.2	
	Total	141	100	

Socio economic status	Lower	27	19.14	< .00001
	Lower middle class	81	57.44	
	Middle class	18	12.76	
	Upper middle class	15	10.63	
	Total	141	100	
Marital status	Married	134	95.03	< .00001
	Widow	7	4.97	
	Total	141	100	
Education	Illiterate	13	9.21	< .00001
	Primary	47	33.33	
	Secondary	51	36.17	
	Graduate	30	21.27	
	Total	141	100	
Occupation	Housewife	123	86.97	< .00001
	Labour	6	4.25	
	Farmer	4	2.83	
	Beautician	2	1.41	
	Anganwadi Sevika	2	1.41	
	Teacher	1	0.7	
	Clerk	1	0.7	
	Bank employee	1	0.7	
	Employee	1	0.7	
	Total	141	100	
Residence	Rural	84	59.3	< .00001
	Urban	57	40.7	
	Total	141	100	
No. of children	0	21	15.3	< .00001
	1	42	29.6	
	2	56	39.8	
	3	16	11.1	
	4	6	4.2	
	Total	141	100	
History of addiction	Tobacco chewing	16	11.34	< .00001
	Nill	135	88.65	
	Total	141	100	

Table 2: Frequency and Percentage Distribution of Study Participants Based on Depression Symptom Responses (PHQ-9 Items)

	Response Option	Frequency (n)	Percentage (%)	P Value
Little interest or pleasure in doing things	0 = Not at all	41	28.90%	< .00001
	1 = Several days	67	47.90%	
	2 = More than half days	23	16.20%	
	3 = Nearly every day	10	7.00%	
	Total	141	100%	
Feeling down, depressed, or hopeless	0 = Not at all	27	19.10%	< .00001
	1 = Several days	80	56.70%	
	2 = More than half days	26	18.40%	
	3 = Nearly every day	8	5.80%	
	Total	141	100%	
Trouble falling asleep or sleeping too much	0 = Not at all	38	26.80%	< .00001
	1 = Several days	67	47.90%	
	2 = More than half days	28	19.70%	
	3 = Nearly every day	8	5.60%	
	Total	141	100%	
Feeling tired or having little	0 = Not at all	39	27.50%	< .00001

energy	1 = Several days	60	43.00%	
	2 = More than half days	31	21.80%	
	3 = Nearly every day	11	7.70%	
	Total	141	100%	
Poor appetite or overeating	0 = Not at all	44	31.00%	< .00001
	1 = Several days	64	45.80%	
	2 = More than half days	23	16.20%	
	3 = Nearly every day	10	7.00%	
	Total	141	100%	
Feeling bad about yourself - or that you are a failure or have let yourself or family down	0 = Not at all	24	16.90%	< .00001
	1 = Several days	74	52.80%	
	2 = More than half days	33	23.20%	
	3 = Nearly every day	10	7.00%	
	Total	141	100%	
Thoughts that you would be better off dead, or ofhurting yourself in some way	0 = Not at all	60	42.60%	< .00001
	1 = Several days	52	36.90%	
	2 = More than half days	16	11.30%	
	3 = Nearly every day	13	9.20%	
	Total	141	100%	
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	0 = Not at all	36	25.40%	< .00001
	1 = Several days	74	52.80%	
	2 = More than half days	19	13.40%	
	3 = Nearly every day	12	8.50%	
	Total	141	100%	
Thoughts that you would be better off dead, or ofhurting yourself in some way	0 = Not at all	60	42.60%	< .00001
	1 = Several days	52	36.90%	
	2 = More than half days	16	11.30%	
	3 = Nearly every day	13	9.20%	
	Total	141	100%	

Table 3: Distribution of Study Participants According to PHQ-9 Score Ranges and Depression Severity

PHQ -9 score Range	Depression Severity	Total Samples
0 to 4	Minimal/None (No treatment needed)	46
5 to 9	Mild (Watch-full)	63
10 to 14	Moderate (Consider Counseling, Follow up and/or Medication)	23
15 to 19	Moderately Severe (Active treatment with Medication and/or Psychotherapy)	8
20 to 27	Severe (Immediate initiation treatment; Possible urgent referral)	1

Table 4: Association Between Depression Severity and Socioeconomic Status Among Study Participants

Depression Severity	Socioeconomic status					
	Lower	Lower Middle	Middle	Upper Middle	Upper Class	Total
Minimal/None (No treatment needed)	3	30	7	5	0	45
Mild (Watch-full)	6	42	10	4	0	62
Moderate (Consider Counseling, Follow up and/or Medication)	12	6	4	4	0	26
Moderately Severe (Active treatment with Medication and/or Psychotherapy)	4	2	0	1	0	7
Severe (Immediate initiation treatment; Possible urgent referral)	0	1	0	0	0	1
Total	25	81	21	14	0	141

Figure 1: Distribution of Age group in years, Socio economic status, Marital status and Education

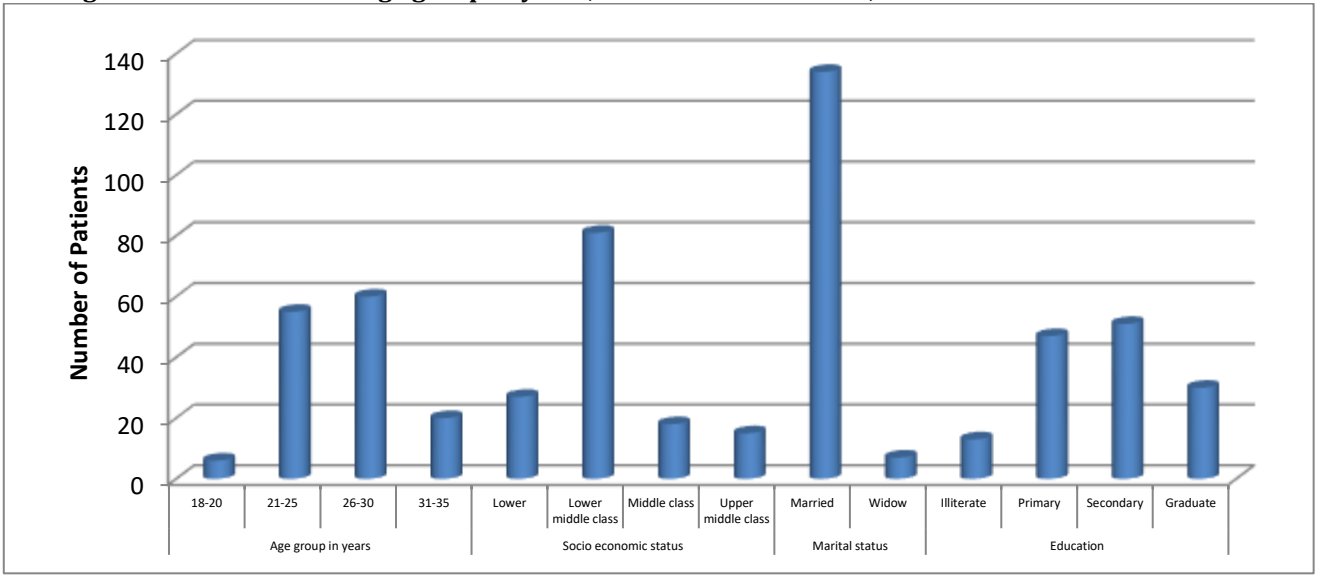
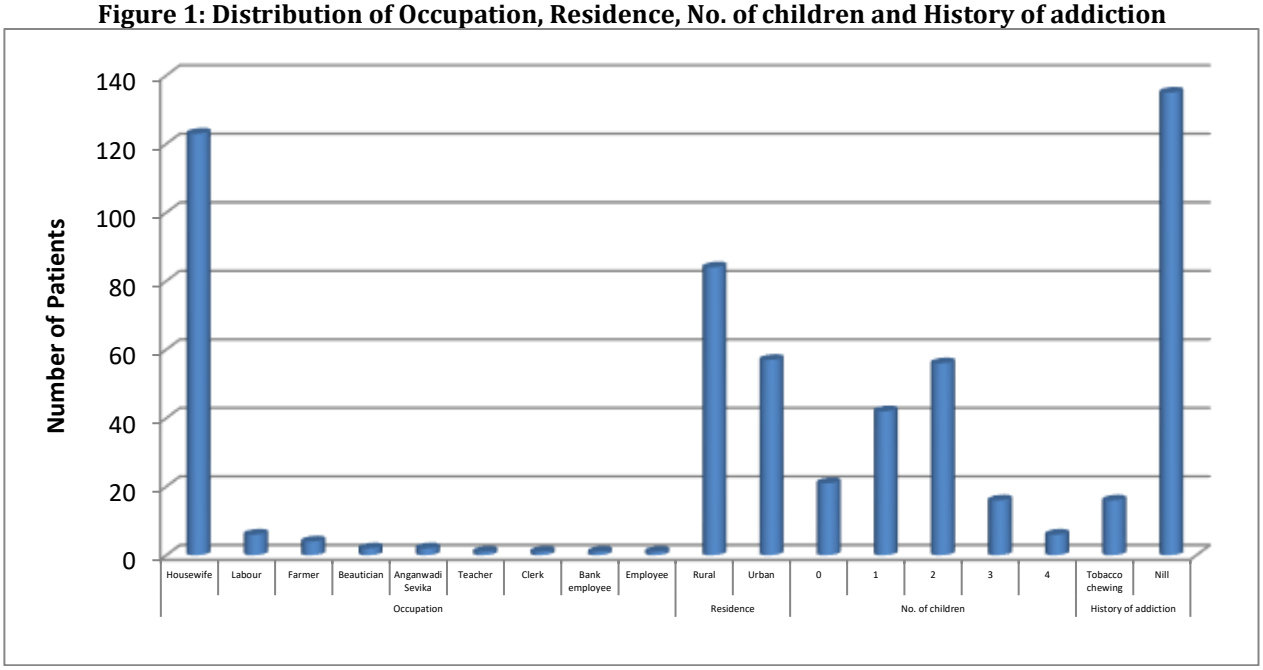


Figure 1: Distribution of Occupation, Residence, No. of children and History of addiction



In our study of 141 antenatal women, the age distribution showed that 6 women (4.25%) were between 18–20 years, 55 women (39%) were 21–25 years, 60 women (42.55%) were 26–30 years, and 20 women (14.2%) were 31–35 years, with a statistically significant difference ($p < 0.00001$). Regarding socioeconomic status, 27 women (19.14%) belonged to the lower class, 81 women (57.44%) to the lower middle class, 18 women (12.76%) to the middle class, and 15 women (10.63%) to the upper middle class ($p < 0.00001$). Marital status analysis revealed that 134 women (95.03%) were married, while 7 women (4.97%) were widows ($p < 0.00001$). Education-wise, 13 women (9.21%) were illiterate, 47 women (33.33%) had primary education, 51 women (36.17%) had secondary education, and 30 women (21.27%) were graduates ($p < 0.00001$). Concerning occupation, the majority were housewives (n = 123, 86.97%), while 6 women (4.25%) were engaged in labor work, 4 (2.83%) were farmers, 2 (1.41%) were beauticians, 2 (1.41%) were Anganwadi Sevika, and one woman each (0.7%) was a teacher, clerk, bank employee, or other employee ($p < 0.00001$). Regarding residence, 84 women (59.3%) were from rural areas and 57 women (40.7%) were from urban areas ($p < 0.00001$). The number of children per participant revealed that 21 women (15.3%) were primigravida, 42 women (29.6%) had one child, 56 women (39.8%) had two children, 16 women (11.1%) had three children, and 6 women (4.2%)

had four children ($p < 0.00001$). Finally, the history of addiction showed that 16 women (11.34%) reported tobacco chewing, whereas the remaining 125 women (88.65%) had no history of addiction ($p < 0.00001$).

In our study of 141 antenatal women assessed using the PHQ-9 scale, 41 women (28.9%) reported having little interest or pleasure in doing things "not at all," 67 (47.9%) reported this "several days," 23 (16.2%) "more than half the days," and 10 (7.0%) "nearly every day" ($p < 0.00001$). Feeling down, depressed, or hopeless was absent in 27 women (19.1%), but present "several days" in 80 (56.7%), "more than half the days" in 26 (18.4%), and "nearly every day" in 8 (5.8%) ($p < 0.00001$). Trouble falling asleep or sleeping too much was reported "not at all" by 38 women (26.8%), on "several days" by 67 (47.9%), "more than half the days" by 28 (19.7%), and "nearly every day" by 8 (5.6%) ($p < 0.00001$). Feeling tired or having little energy was reported "not at all" by 39 women (27.5%), "several days" by 60 (43.0%), "more than half the days" by 31 (21.8%), and "nearly every day" by 11 (7.7%) ($p < 0.00001$). Poor appetite or overeating was absent in 44 women (31.0%), reported "several days" by 64 (45.8%), "more than half the days" by 23 (16.2%), and "nearly every day" by 10 (7.0%) ($p < 0.00001$). Feeling bad about themselves or feeling like a failure was reported "not at all" by 24 women (16.9%), "several days" by 74 (52.8%), "more than half the days" by 33 (23.2%), and "nearly every day" by 10 (7.0%) ($p < 0.00001$). Thoughts of being better off dead or of self-harm were denied by 60 women (42.6%), reported "several days" by 52 (36.9%), "more than half the days" by 16 (11.3%), and "nearly every day" by 13 (9.2%) ($p < 0.00001$). Moving or speaking so slowly that others could notice, or being so fidgety or restless that movement increased, was reported "not at all" by 36 women (25.4%), "several days" by 74 (52.8%), "more than half the days" by 19 (13.4%), and "nearly every day" by 12 (8.5%) ($p < 0.00001$).

In our study of 141 antenatal women, PHQ-9 scores indicated that 46 women had minimal or no depression (score 0–4), requiring no treatment. A total of 63 women scored between 5–9, corresponding to mild depression, for which careful monitoring is recommended. Twenty-three women had scores of 10–14, reflecting moderate depression, where counseling, follow-up, and/or medication may be considered. Eight women scored 15–19, indicating moderately severe depression, suggesting the need for active treatment with medication and/or psychotherapy. Only one woman had a score between 20–27, classified as severe depression, necessitating immediate treatment and possible urgent referral.

In our study of 141 antenatal women, analysis of depression severity according to socioeconomic status revealed that among those with minimal or no depression, 3 women were from the lower class, 30 from the lower middle class, 7 from the middle class, 5 from the upper middle class, and none from the upper class, totaling 45 women. For mild depression, 6 women belonged to the lower class, 42 to the lower middle class, 10 to the middle class, 4 to the upper middle class, and none to the upper class, totaling 62 women. Moderate depression was observed in 12 women from the lower class, 6 from the lower middle class, 4 from the middle class, 4 from the upper middle class, and none from the upper class, totaling 26 women. Among those with moderately severe depression, 4 women were from the lower class, 2 from the lower middle class, none from the middle class, 1 from the upper middle class, and none from the upper class, totaling 7 women. Only one woman from the lower middle class was classified as having severe depression, with no cases reported in other socioeconomic categories. Overall, this distribution highlights that lower and lower middle socioeconomic groups comprised the majority of women with higher depression severity in our cohort.

DISCUSSION

In our study of 141 antenatal women screened using the PHQ-9 questionnaire, a significant proportion demonstrated varying degrees of depressive symptoms, with the majority falling in the mild-to-moderate range. The overall prevalence of depressive symptoms in the antenatal period was comparable to findings from other Indian and international studies. Antenatal depression has been recognized as one of the most common psychiatric morbidities among pregnant women, affecting both maternal and fetal outcomes adversely [11]. Similar to our findings, Patel et al. (2020) reported that nearly 45% of antenatal women experienced some degree of depression, with mild depression being the most frequent category [12]. Likewise, Deshpande et al. (2021) observed that 41% of pregnant women in their study exhibited mild to moderate depressive symptoms, emphasizing the burden of subclinical depression in antenatal care settings [13].The present study demonstrated that women from lower and lower-middle socioeconomic classes were more likely to experience moderate to severe depression. This socioeconomic gradient in depression is consistent with previous research showing that limited financial resources, low educational attainment, and lack of social support contribute significantly to antenatal depressive symptoms [14]. Bhatia et al. (2019) also reported that low socioeconomic status and unplanned

pregnancies were among the strongest predictors of antenatal depression [15]. A study conducted by Raghavan et al. (2017) in South India found that antenatal women with lower income and poor family support had twice the odds of developing depression compared to those from higher income groups [16]. These findings suggest that financial insecurity and psychosocial stressors may play a pivotal role in determining mental health outcomes during pregnancy. Educational level and occupation also appeared to influence depression severity in our study. Most women with moderate to severe depression were either illiterate or had only primary-level education, similar to the findings of Upadhyay et al. (2020), who demonstrated that limited education was associated with poor awareness about mental health and reduced coping mechanisms [17]. The predominance of housewives among the depressed group in our study mirrors the pattern seen in a study by Agarwal et al. (2021), where unemployment or lack of engagement in productive activity was associated with increased depressive symptomatology [18]. This suggests that lack of financial independence and restricted social interaction might exacerbate psychological distress during pregnancy. The age distribution in our study revealed that women between 26–30 years showed the highest prevalence of depressive symptoms. This aligns with a multicentric Indian study by Dubey et al. (2018), which reported the peak occurrence of antenatal depression in women aged 25–30 years, often due to familial responsibilities and social pressures [19]. Furthermore, the presence of multiple children and a history of addiction, such as tobacco chewing, were associated with higher depression scores in our population, consistent with similar observations made by Shivalli et al. (2019), who highlighted that higher parity and substance use increased vulnerability to mood disorders during pregnancy [20].The symptom pattern observed in the PHQ-9 responses—such as loss of interest, fatigue, poor appetite, and sleep disturbance—reflects classical depressive symptomatology documented in literature. The predominance of mild depressive symptoms in nearly half the participants emphasizes the need for early screening and preventive mental health strategies during antenatal care visits. Many women in low-resource settings remain undiagnosed due to lack of routine psychiatric evaluation in obstetric clinics. Hence, the PHQ-9 serves as a simple, validated, and effective screening tool to detect psychological distress early and facilitate timely intervention In summary, our findings reinforce the growing evidence that antenatal depression is a multifactorial condition influenced by socioeconomic, educational, and psychosocial determinants. The pattern of results corresponds with other Indian studies, underscoring the necessity of integrating mental health assessment into standard antenatal care. Early detection and management of depression through psychosocial counseling, lifestyle modifications, and where necessary, pharmacotherapy, could potentially improve both maternal well-being and pregnancy outcomes.

CONCLUSION

- In summary, the present study highlights that antenatal depression is a significant concern among pregnant women, with varying degrees of severity observed across different socioeconomic backgrounds. The findings suggest that most women experienced mild to moderate depressive symptoms, indicating the need for early detection and timely psychosocial support. The association between depression and lower socioeconomic status underscores the impact of financial constraints, limited education, and reduced access to healthcare on maternal mental health. Women who were less educated, unemployed, or residing in rural areas appeared more vulnerable to emotional distress, emphasizing the influence of social determinants on psychological well-being during pregnancy. The symptom pattern reflected typical features of antenatal depression, such as loss of interest, fatigue, poor sleep, and feelings of worthlessness, which, if left unaddressed, could negatively affect both maternal and fetal outcomes. These results reinforce the importance of routine mental health screening during antenatal visits using standardized tools like the PHQ-9, along with counseling and community-based interventions aimed at improving emotional resilience. Strengthening awareness, ensuring social support, and integrating mental health services within primary obstetric care are crucial strategies to enhance maternal health outcomes and prevent the long-term consequences of untreated antenatal depression.

LIMITATIONS

- The study was conducted at a single center which restricts the findings from being generalized to other regions with different sociocultural and health care contexts.
- Use of PHQ- 9 scale though validated, limited assessment to depressive symptoms, and did not capture other psychiatric morbidities such as anxiety psychosis or bipolar disorder which may coexist and affect maternal well being.
- The reliance on self data raises the possibility of under reporting due to stigma particularly in insensitive areas like suicidal ideation and substance use within the household.

- While socio demographic correlates were studied, long term maternal and child outcomes were not assessed, leaving unanswered questions about the impact of maternal depression on child development and inter generational cycle of disadvantage.
- Being a cross sectional study the design allows identification of association between depression and risk factors but cannot establish causality.

FUTURE SCOPE

Future research can expand upon these findings conducting multicentric studies with larger and more diverse sample sizes to improve generalizability across different regions and socio economic contexts. There is also a scope to develop integrated screening protocols that combine PHQ-9 with tools for anxiety, psychosis and stress related disorders, thereby capturing a broader spectrum of maternal mental health. Community based screening models, specially in rural areas, can help reach women who may not attend health facility regularly, insuring early detection and timely support. Longitudinal studies would also be valuable in tracking weather depressive symptoms identified during the antenatal or early maternal phase, persist into the postpartum period and how these symptoms influence child development outcome such as nutrition, school readiness and emotional health. Lastly incorporating mental health into routine maternal health programmes, through collaborative approaches linking psychiatry with obstetric community, health workers and social support services could provide sustainable improvements in maternal mental health and overall family wellbeing.

DECLARATIONS

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Conflict of interest -Nil
Institutional Ethical Committee approval obtained before conducting study.

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