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Prevalence and associated factors of antenatal depression among pregnant women attending Shegaw Motta general Hospital, East Gojjam Zone, Ethiopia

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Antenatal depression is a commonly overlooked mental health condition that affects many women during pregnancy, often more severely than after childbirth. It presents with emotional distress and cognitive difficulties such as poor memory and concentration. Addressing this issue is vital, as it impacts not only the mother's well-being but also the healthy development of her child. This study aims to assess the prevalence of antenatal depression and the factors contributing to it. A cross-sectional study was conducted on 363 pregnant women using the Beck Depression Inventory. Data were collected from February 1 to March 21, 2020, using a systematic random sampling method. Statistical analysis was performed using SPSS version 25, applying binary logistic regression to identify factors significantly associated with antenatal depression at a 95% confidence level. The prevalence of antenatal depression was found to be 22%, and factors such as marital status, education level, and lack of social support were associated with it. This result revealed that the prevalence of antenatal depression was 22%. This highlights the need for routine depression screening during ANC and strengthening psychosocial support services, particularly for women with unplanned pregnancies and limited social support.

Keywords Antenatal depression, Prevalence, Associated factors, Pregnant women, Ethiopia

Depression is a common mental health disorder characterized by persistent sadness, loss of interest, feelings of guilt, and low self-esteem. It ranks among the top three causes of global disease burden and is particularly disabling for women across their life course[1,2]. One specific form, antenatal depression (AD), occurs during pregnancy and is marked by emotional disturbances such as poor concentration, fatigue, and mood changes lasting more than two weeks. This condition is often underrecognized, despite its significant implications for maternal and child health[3].

Pregnancy is often viewed as a time of joy and anticipation. However, many women, especially in resource-limited settings, experience substantial physiological, psychological, and social changes during this period, which may increase their vulnerability to emotional distress[4]. Global studies report that 15% to 65% of pregnant women may experience symptoms of depression[5,6]. If left untreated, antenatal depression can affect a woman's ability to function, strain relationships, disrupt fetal development, reduce antenatal care attendance, and even increase the risk of postnatal depression and infant mortality[7–11].

In Ethiopia, maternal mental health remains a neglected area within reproductive health services. Although national and regional efforts have improved maternal care, mental health, particularly during pregnancy, has not been adequately prioritized. Studies conducted across various parts of the country report the prevalence of antenatal depression ranging between 15.2% and 35.4%[11–15]. However, much of this evidence is concentrated in urban or central settings, leaving many rural areas under-researched.

The Beck Depression Inventory (BDI) captures a broader range of cognitive and somatic symptoms of depression, whereas the Edinburgh Postnatal Depression Scale (EPDS) is designed specifically to emphasize

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perinatal emotional symptoms. These differences in focus contribute to variations in prevalence estimates reported across studies.

To understand AD in its local context, it is helpful to consider social stress theory and biopsychosocial models, which emphasize the role of socio-demographic, psychological, and environmental stressors in shaping mental health outcomes during pregnancy. These frameworks guide this study in identifying both individual- and community-level risk factors[16].

Although several studies in Ethiopia have reported antenatal depression, most are concentrated in urban or central areas. Little is known about rural settings such as East Gojjam Zone, where socio-cultural and economic contexts may uniquely influence maternal mental health.

Methods

Study design, setting, and period

A facility-based cross-sectional study was conducted from February 1 to March 21, 2020, at Shegaw Motta General Hospital, located in Motta town, East Gojjam Zone, Amhara Region, Ethiopia. Motta is situated approximately 371 km northwest of Addis Ababa, the capital city of Ethiopia, and about 120 km southeast of Bahir Dar, the regional capital. The town has one government health center, one general hospital, and five private clinics. According to local estimates, Motta has a total population of 37,504, comprising 18,606 males and 18,898 females. Among the female population, 14,278 are of reproductive age. Shegaw Motta General Hospital provides health services to over 25,000 people and delivers antenatal care (ANC) to more than 400 pregnant women each month.

Population

The source population comprised all pregnant women attending ANC services at Shegaw Motta General Hospital. Women with a self-reported history of depression were included because the study aimed to assess both current and recurrent depressive symptoms. However, pregnant women who were critically ill at the time of data collection were excluded from the study.

Sample size determination

The sample was determined using the first and second objectives.

The required sample size was determined using a single population proportion formula by taking a p-value of 23%[17], 95% confidence level, 5% margin of error, and adding a 10% non-response rate.

The formula to determine the sample size was.

Then the sample became 370 after adding a 10% non-response rate.

For the second objective factor[17], as shown in the table below, was calculated using Epi Info software version 7 by considering the following assumptions: confidence level of 95%, power of 80%, and exposure to the unexposed ratio of 1 (Table 1).

After adding a 10% non-response rate, the final sample size became 370, and being a housewife was the determining factor of the sample size from the second objective.

Sampling procedure

A systematic random sampling technique was employed to select the study participants. According to the most recent two-month report from the ANC registration book, a total of 830 pregnant women attended ANC services at the facility. The sampling frame included all eligible pregnant women attending ANC during the study period.

To begin, the first participant was selected using the lottery method from among the first three attendees on the initial day of data collection. Subsequently, participants were selected at a regular interval for every third attendee ($k = N/n = 830/370 \approx 2.24$, rounded to 3), where N represents the total population and n denotes the required sample size. This process continued in sequence according to the order of arrival for ANC follow-up until the desired sample size was achieved.

Measurements and operational definition

The dependent variable in this study was AD. It was defined as a BDI score ≥ 17, indicating moderate to severe depressive symptoms. Independent variables included socio-demographic characteristics, obstetric factors, substance use, and psychosocial attributes. AD was assessed using the BDI, a widely used standardized screening tool for depressive symptoms. The BDI consists of 21 items, each rated on a 4-point Likert scale, with total scores ranging from 0 to 63. The tool has demonstrated strong internal consistency in various populations, with Cronbach's alpha ranging from 0.85 to 0.90[18]. In the current study, the Amharic-translated version of the BDI was pretested, and the reliability yielded a Cronbach's alpha of 0.87, indicating high internal consistency.

S.no	Factors	Ratio	power	CI	AOR	percent of exposed	percent of unexposed	Sample size
1	Age(20–29)	1	80%	95%	0.18	18.6	73.8	56
2	Housewife	1	80	95	2.57	26.7	79.3	336
3	Primigravida	1	80	95	4.74	24.1	77.8	82
4	Irregular ANC	1	80	95	11.43	42.9	75.6	94

Table 1. Sample size determination using the second objective for mothers attending ANC follow-up in Shegaw Motta general Hospital, Northwest, Ethiopia, 2020.

Data collection tools and procedures
Data were collected using a face-to-face interviewer-administered questionnaire that was pretested for clarity and reliability. The BDI was translated into Amharic using a forward and backward translation process to ensure linguistic and conceptual equivalence. The Amharic version was then pilot-tested in a similar population, demonstrating acceptable validity and reliability for this study. The questionnaire also included items on socio-demographic characteristics, obstetric history, substance use, and psychosocial factors. Two diploma-level midwives served as data collectors, supervised by two BSc-level midwives who ensured data quality.

Data quality control
Data quality assurance measures were implemented before, during, and after data collection. The questionnaire was initially developed in English, translated into Amharic, and subsequently back-translated into English to ensure semantic consistency. A pretest was conducted on 19 participants at Bichena Hospital, a facility not included in the main study, to evaluate the questionnaire's clarity, appropriateness, and reliability. Based on the pretest findings, revisions and adjustments were made to enhance the tool's validity. Additionally, a one-day training session was provided to data collectors and supervisors, emphasizing a clear understanding of the research objectives, sampling procedures, and the ethical responsibilities of the research team, as guided by the principal investigator.

Data processing and analysis
After coding and verifying for completeness, the data were entered into EpiData version 4.2 and subsequently exported to SPSS version 25 for statistical analysis. Descriptive statistics were used to summarize the independent variables. To examine the association between AD and the explanatory variables, binary logistic regression analysis was conducted. Variables with a p-value ≤ 0.25 in the bivariate analysis were considered for inclusion in the multivariable logistic regression model. We controlled for potential confounders such as socioeconomic status and obstetric history in the multivariable logistic regression model. While this threshold is more liberal than the conventional $p < 0.05$, it was chosen to reduce the risk of omitting potentially important variables at the exploratory stage, as recommended in certain epidemiological studies. Logistic regression assumptions were carefully checked before analysis. Model fit was evaluated using the Hosmer-Lemeshow goodness-of-fit test ($p = 0.17$), suggesting an acceptable fit. However, we acknowledge that this test only assesses overall calibration. Future studies may consider additional model evaluation tools such as the Receiver Operating Characteristic curve and Area Under the Curve to better assess model discrimination. Statistical significance in the final model was declared at $p < 0.05$, and adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were reported.

Ethical consideration
Ethical approval for this study was obtained from the Institutional Review Board (IRB) of Bahir Dar University, College of Medicine and Health Sciences, per the Declaration of Helsinki. Before data collection, formal permission letters were secured from the relevant health authorities. All participants were thoroughly informed about the purpose, objectives, and potential benefits of the study. Written informed consent was obtained from each participant, and confidentiality of the information provided was strictly maintained throughout the study process.

Results
Socio-demographic characteristics of respondents
Out of the 370 eligible respondents, 363 participated, yielding a response rate of 98.1%. The mean age of the participants was 25 years (SD ± 6.25). The majority, 254 (70%), resided in urban areas, and 109 (30%) were housewives. Nearly all participants, 355 (97.8%), identified as Amhara by ethnicity. Regarding educational status, 77 (21.2%) had attained only primary education. In terms of economic status, 130 participants (35.8%) reported an average monthly income of less than 2,000 Ethiopian Birr (Table 2).

Obstetric characteristics of respondents
Among the respondents, **106 (29.2%)** were **primigravida.** Nearly one-third, **32 (12.5%)**, reported a history of **preterm birth**. Additionally, **63 (17.4%)** of the women experienced complications during their most recent pregnancy (Table 3).

Psychosocial and substance use characteristics of respondents
A total of 41 (11.3%) respondents reported a previous history of depression, while 31 (8.5%) indicated a family history of depression. Approximately half of the respondents, 188 (50.8%), reported having social support. Additionally, 69 (19%) of the participants had experienced stressful life events. Substance use was reported by only 12 (3.3%) of the respondents (Table 4).

Prevalence of antenatal depression
The overall prevalence of AD was 22% with 95% CI (17.75–26.32). Out of the total, tiredness 289(79.6%) and loss of energy 268(73.8%) were the most reported symptoms in the antenatal period (Table 5).

Factors associated with antenatal depression
In the multivariable analysis, marital status [AOR = 3.87, 95% CI: 1.87–7.99], educational status [AOR = 4.44, 95% CI: 1.79–11.00], history of medical problems [AOR = 3.35, 95% CI: 1.44–7.83], previous history of depression [AOR = 2.60, 95% CI: 1.11–6.10], lack of social support [AOR = 3.82, 95% CI: 1.96–7.45], and unplanned pregnancy [AOR = 3.79, 95% CI: 1.91–7.56] were significantly associated with antenatal depression (Table 6).

Variables	Frequency	Percent
Age in years		
15–24	152	41.9
25–34	184	50.7
≥ 35	27	7.4
Religion		
Orthodox	322	88.7
Muslim	41	11.3
Residence		
Urban	254	70
Rural	109	30
Ethnicity		
Amara	355	97.8
Oromo	8	2.2
Marital status		
Married	298	82.1
Single	65	17.9
Educational status		
No formal education	37	10.2
Primary	77	21.2
Secondary	87	24
College/university	162	44.6
Occupational status		
Housewife	114	31.4
Merchant	86	23.7
Government/private employee	103	28.4
Daily labourer	60	16.5
Family size		
1–2	168	46.3
≥ 3	195	53.7
Income		
≤ 2000	130	35.8
2000–4000	127	35
≥ 4000	106	29.2
Husband occupation ($n = 298$)		
Merchant	104	34.9
Government/private employee	162	54.4
Daily labourer	32	10.7
Husband's educational level ($n = 298$)		
No formal education	42	14.1
Primary education	98	32.9
Secondary education	80	26.8
College/university	78	26.2

Table 2. Socio-demographic characteristics of the respondents in Shegaw Motta Hospital, North West, Ethiopia, 2020($n = 363$).

Discussion

The prevalence of depression in our study was 22%, compared to 24.5% in Northeast Ethiopia[12] and 23% in Gondar[17], Hawassa (21.5%)[19], North India (21%)[20], and Brazil (21.1%) [21. However, the observed prevalence was lower than that reported in Maichew (31.1%)[21], Adama Hospital (31.2%)[22], Saudi Arabia (31.9%)[23], and Bangalore (35.7%)[5]. These discrepancies may be attributed to several contextual factors, including variations in cultural beliefs, socioeconomic status, and healthcare accessibility. For example, in settings like Saudi Arabia and Bangalore, different cultural expectations and limited mental health integration into antenatal services may contribute to higher AD rates. Methodological differences also play a role; unlike our study, which used the BDI, other studies employed tools such as the EPDS, which differ in sensitivity and symptom threshold. Such methodological variations can influence the detection rate and severity classification of depression symptoms.

Conversely, our prevalence was higher than findings from Debre Tabor (11.8%)[10], Brazil (14.2%)[24], and Washington (9.9%)[25]. These differences may be influenced by differences in the sociodemographic makeup of

Variables	Frequency	Percentage
Gravidity		
Primigravida	106	29.2
Multigravida	230	63.4
Grand multigravida	27	7.4
Parity($n=257$)		
Null Para	23	8.9
Primipara	118	45.9
Multipara	116	45.2
Current pregnancy planned		
Yes	289	79.6
No	74	20.4
Age of pregnancy		
First trimester	24	6.6
Second trimester	146	40.2
Third trimester	193	53.2
Complications during the current pregnancy		
Yes		
No	63	17.4
	300	82.6
Previous pregnancy-related complication($n=257$)		
Yes		
No	36	14
	221	86
Previous labor/delivery related complication($n=257$)		
Yes		
No	63	24.5
	194	75.5
History of abortion ($n=257$)		
Yes	66	25.7
No	191	74.3

Table 3. Obstetric characteristics of respondents in Shegaw Motta Hospital, northwest, Ethiopia, 2020($n=363$).

the population, awareness and stigma surrounding mental health, or sample size and timing of data collection during pregnancy.

This study identified several significant predictors of antenatal depression, each of which was explained as follows:

Marital status Single women were more likely to experience antenatal depression than their married counterparts. This finding is consistent with studies from Northeast Ethiopia[12], Arbaminch[26], and Brazil[27]. The increased vulnerability may be attributed to stigma associated with premarital pregnancy, leading to social isolation, lack of partner and family support, and economic challenges. In the Ethiopian context, cultural expectations around marriage and motherhood can intensify emotional stress for unmarried pregnant women, further compounding mental health risks.

Chronic medical illness Women with a history of chronic illness showed significantly higher odds of experiencing depression, showing findings from Nigeria[28], Arbaminch[26], and Washington[25]. Chronic illnesses may reduce a woman's ability to carry out daily activities, lower her self-confidence, and foster a sense of hopelessness, factors that can aggravate depressive symptoms. In rural Ethiopian communities, limited access to ongoing treatment or specialist care may worsen this burden.

Unplanned pregnancy Consistent with literature from Dubti[1], Oman[29], and Turkey[2], distress, uncertainty, and financial insecurity often accompany unplanned pregnancies, especially in low-income settings where reproductive autonomy may be limited. In traditional Ethiopian society, cultural expectations around marriage, childbearing, and family roles can result in negative community attitudes toward unplanned pregnancies, increasing social pressure and stigma.

Variables	Frequency	Percent
Family history of depression		
Yes	31	8.5
No	332	91.5
Previous history of depression		
Yes	41	11.3
No	322	88.7
Family history of chronic medical illness		
Yes	87	24
No	276	76
Personal medical illness		
Yes	42	11.6
No	321	88.4
Social support from the family network		
Yes	188	51.8
No	175	48.2
Stressful life event		
Yes	69	19
No	294	81
Domestic violence		
Yes	43	11.8
No	320	88.2
Substance use		
Yes	12	3.3
No	351	96.7

Table 4. Psycho-social and substance use characteristics of mothers attending ANC follow-up in Shegaw Motta Hospital, northwest, Ethiopia, 2020($n = 363$).

Lack of family support Women reporting low social support were at increased risk of depression, as seen in studies from Hawassa[19], Rwanda[30], and Bangladesh[31]. In Ethiopian culture, family is often the primary support system during pregnancy. When this is absent due to migration, marital conflict, or stigma, the resulting emotional and material insecurity can predispose women to mental distress. Support systems provide not only emotional comfort but also practical help in navigating pregnancy-related challenges.

Previous history of depression Women with a prior diagnosis of depression were more likely to report antenatal depression. Similar associations were found in Debre Tabor[10], Tanzania[9], and Brazil[24]. This suggests that biological vulnerability, along with unresolved psychological stressors, can recur during pregnancy. Given the cyclical nature of depression, pregnancy may act as a trigger for relapse.

Educational status Lack of formal education was significantly associated with antenatal depression, supporting evidence from Nigeria[28], Arbaminch[32], and Bangladesh[31]. Lower educational attainment may limit women's health literacy, economic independence, and coping strategies. In the Ethiopian setting, uneducated women may have reduced access to accurate health information, leading to delayed help-seeking and greater susceptibility to emotional stressors.

Implications and limitations

This study was done by using a cross-sectional design, which prevents the determination of cause-and-effect relationships. As this was a hospital-based study, the findings may not fully represent the prevalence of antenatal depression in the wider community. Moreover, relying on self-reported data may introduce reporting bias, as participants might underreport symptoms due to stigma or cultural perceptions of mental illness. Methodologically, the use of different screening tools like EPDS vs. BDI can impact prevalence estimates. Each tool has unique cutoff thresholds and symptom sensitivity, which may partially explain cross-study differences.

These findings suggest integrating depression screening into routine ANC visits, strengthening community-based psychosocial support networks, and prioritizing vulnerable groups such as women with unplanned pregnancies, single mothers, and those with chronic illness. Training health workers in early identification and referral of antenatal depression should be a key policy priority.

Conclusion

Antenatal depression affected 22% of pregnant women in this study. Factors such as being single, uneducated, having a chronic illness, lacking family support, and experiencing an unplanned pregnancy increased the risk.

Variables	Frequency	Percentage
Sadness		
Yes	160	44.1
No	203	55.9
Pessimism		
Yes	65	17.9
No	298	82.1
Past failure		
Yes	117	32.2
No	246	67.8
Loss pleasure		
Yes	143	39.4
No	220	60.6
Guilty feeling		
Yes	72	19.8
No	291	80.2
Punishment feeling		
Yes	57	15.7
No	306	84.3
Self-dislike		
Yes	60	16.5
No	303	83.5
Self-criticalness		
Yes	51	14
No	312	86
Suicidal thoughts or wishes		
Yes	56	15.4
No	307	84.6
Crying		
Yes	166	45.7
No	197	54.3
Agitation		
Yes	182	50.1
No	181	49.9
Loss of interest		
Yes	90	24.8
No	273	75.2
Indecisiveness		
Yes	77	21.2
No	286	78.8
Worthlessness		
Yes	42	11.6
No	321	88.4
Loss of energy		
Yes	268	73.8
No	95	26.2
Change of sleep pattern		
Yes	162	44.6
No	201	55.4
Irritability		
Yes	128	35.3
No	235	64.7
Change in appetite		
Yes	235	64.7
No	128	35.3
Concentration difficulty		
Yes	144	39.7
Continued		

Variables	Frequency	Percentage
No	249	60.3
Tiredness		
Yes	289	79.6
No	74	20.4
Loss of interest in sex		
Yes	200	55.1
No	163	44.9
Overall depression		
Yes	80	22 (17.75–26.32)
No	283	78

Table 5. Prevalence of antenatal depression of mothers attending ANC follow-up in Shegaw Motta Hospital, northwest, Ethiopia, 2020($n = 363$).

Antenatal depression				
Variables	**Yes($n = 80$)**	**No($n = 283$)**	**COR**	**AOR**
Marital status				
single	33(9.1%)	32(8.8%)	5.51(3.09, 9.81)	3.87(1.87,7.99) **
Married	47(12.9%)	251(69.1%)	1	1
Educational status				
No formal education	17(4.7%)	20(5.5%)	5.14(2.35,11.24)	4.44(1.79,11.00)**
Primary School	28(7.7%)	49(13.5%)	3.45(1.82,6.55)	2.22(0.02, 4.87)
Secondary School	12(3.3%)	75(20.7%)	0.95(0.45, 2.02)	0.86(0.35, 2.08)
College/University	23(6.3%)	139(38.3%)	1	1
Monthly Income				
≤ 2000	42(11.6%)	88(24.2%)	5.14(2.39,11.17)	1.44(0.53, 3.91)
2000–4000	29(8%)	98(27%)	3.19(1.43, 7.09)	1.93(0.72, 5.23)
≥ 4000	9(2.5%)	97(26.7%)	1	1
Medical illness				
Yes	21(5.8%)	21(5.8%)	4.44(2.27, 8.65)	3.35(1.44, 7.83) **
No	59(16.3%)	262(72.2%)	1	1
Current pregnancy status				
Unplanned	38(10.5%)	34(9.4%)	6.76(3.83,11.94)	3.79(1.91,7.56) **
Planned	41(11.4%)	248(68.7%)	1	1
Complications in the current pregnancy				
Yes	28(7.7%)	35(9.6%)	3.82(2.14, 6.81)	1.15(0.49, 2.67)
No	52(14.3%)	248(68.3%)	1	1
Family history of depression				
Yes	16(4.4%)	15(4.1%)	4.47(2.09, 9.51)	1.56(0.49, 4.96)
No	64(17.6%)	268(73.8%)	1	1
Previous history of depression				
Yes	22(6.1%)	19(5.2%)	5.27(2.68,10.36)	2.60(1.11, 6.10) *
No	58(16%)	264(72.7%)	1	1
Social support from family members				
No	62(17.1%)	113(31.1%)	5.18(2.91, 9.22)	3.82(1.96,7.45) **
Yes	18(5%)	170(46.8%)	1	1
Domestic violence				
Yes	20(5.5%)	23(6.3%)	3.77(1.94, 7.30)	0.70(0.26, 1.88)
No	60(16.5%)	260(71.6%)	1	1

Table 6. Bivariable and multivariable logistic regression analysis of factors associated with antenatal depression in Motta Hospital, Northwest, Ethiopia, 2020. *=$P < 0.05$, **=$p < 0.001$, COR = Crude Odds Ratio; AOR = Adjusted Odds Ratio; CI = Confidence Interval.

Integration of depression screening into ANC, coupled with targeted psychosocial interventions, is urgently needed to improve maternal and child health outcomes in Ethiopia.

Data availability

All relevant data are within the manuscript.

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Declarations

Competing interests
The authors declare no competing interests.

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