

# Antenatal Depression and Generalized Anxiety Disorder in a Tertiary Hospital in South India

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## ABSTRACT

**Background:** Antenatal depression is associated with several adverse maternal outcomes, perinatal outcomes, lower academic achievements in adolescence, and future mental health problems for the mothers. Early identification and effective treatment of depression in antenatal women can also improve perinatal outcomes.

**Aim:** This study aims to understand the prevalence of antenatal depression and anxiety disorder, along with associated factors, among antenatal women attending the outpatient clinic of the obstetrics department in a tertiary care hospital.

**Methods:** A cross-sectional design was employed for determining the prevalence, while a case-control framework was used for analysis of the associated factors. Semi-structured sociodemographic pro forma, Patient Health Questionnaire (PHQ-g) Tamil version, and Generalised Anxiety Disorder (GAD-7) Tamil version were administered to antenatal women after obtaining informed consent. Those who scored above 10 points on the PHQ-g or above 9 points on the GAD-7 were interviewed using the Mini-

International Neuropsychiatric Interview (MINI) diagnostic interview schedule, by a psychiatrist, for confirming the diagnosis.

**Results:** In our sample, 22% of the participants were diagnosed with depression, and 23% with generalized anxiety disorder (GAD). Twenty-eight participants (13.4%) had both depression and GAD. Antenatal depression was associated with alcohol use in the spouse ( $P < 0.015$ ), physical violence ( $P < 0.026$ ), low perceived social support from the in-laws ( $P < 0.039$ ), and pressure to have a male child (0.001). Antenatal GAD was associated with low perceived social support from the in-laws ( $P < 0.039$ ) and pressure to have a male child ( $P < 0.041$ ).

**Conclusion:** The occurrence of depression and generalized anxiety disorder is high in antenatal women. Our study identified relevant psychosocial factors that may be potential targets to develop effective interventions.

**Keywords:** Depression, antenatal women, cross-sectional study, social factors

**Key Messages:** Depression and anxiety disorders do exist in a significant proportion of antenatal women attending

an obstetric clinic. Regular screening will enable early identification and effective treatment of depressive and anxiety disorders in antenatal women.

Maternal well-being has been defined as a state in which a mother realizes her abilities and can cope with the common stresses of life and offers a meaningful contribution to her community.<sup>1</sup> Maternal depression is a key impediment to this worthy goal and is largely neglected in most maternal and child well-being programs around the world.<sup>2</sup> A systematic review<sup>3</sup> has shown that it is common in low- and middle-income countries, with a prevalence of 15.6% (95% confidence interval, CI: 15.4–15.9). In a study by George et al.,<sup>4</sup> the prevalence of maternal depression in semi-urban Tamil Nadu was 33 (16.3%).

Multiple factors, which vary depending on the local and cultural factors, have been shown to be associated with maternal depression. Financial difficulties, non-arranged marriage, marital conflict, preference for a male child, previous miscarriage, stillbirth, child with special

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needs, domestic violence, and a partner with alcohol dependence<sup>4-7</sup> were some of the common factors identified in studies conducted in India. Good social support, high satisfaction with pregnancy, and multiparity were protective factors.<sup>6,7</sup>

Depression in pregnant women is associated with poor quality of life,<sup>8</sup> an increase in suicidal behavior,<sup>9</sup> preterm birth,<sup>10</sup> low birth weight,<sup>11</sup> and poor nutrition in the child.<sup>12,13</sup> Further, antenatal depression can contribute to postnatal depression, which is associated with an increase in diarrheal diseases and an early cessation of breastfeeding and increases the chances of antisocial behavior, Attention Deficit Hyperactivity Disorder (ADHD) symptoms, emotional difficulties, and cognitive impairment in the child.<sup>14</sup> Maternal depression is associated with poor academic achievement in the adolescence.<sup>15</sup>

Studies in low- and middle-income countries have shown that it is possible to successfully target maternal depression through lay workers trained in psychosocial interventions<sup>16</sup> and some such workers have been integrated in existing maternal and child health programs.<sup>17-19</sup> Successful treatment of maternal depression has correlated with improvement in mother-child interaction and better rates for breastfeeding and vaccination.<sup>17-19</sup> World Health Organization (WHO) has called for integration of mental health in maternal and child health programs, with a focus on recognition, prevention, early intervention, and treatment of maternal depression.<sup>8</sup>

Yet, services for screening and treatment of depression in pregnant women are not available even in most tertiary care settings in India. There are few studies on antenatal depression and anxiety from India. This study aimed to evaluate the prevalence of antenatal depression, anxiety, and the associated factors in a tertiary care maternity hospital, as a first step towards implementing culturally sensitive evidence-based interventions.

## Materials and Methods

### The Setting

This study was conducted in the antenatal clinic in the department of Obstetrics and Gynecology in a tertiary care teaching hospital. The antenatal clinic

is a busy unit, with an average of about 60 outpatient visits per day. This study was approved by the Institutional Ethics Committee and was conducted from January 2019 to March 2019.

### Design

A cross-sectional design was employed for determining the prevalence, while a case-control framework was used for analysis of the associated factors.

### Recruitment of Subjects

All women attending the antenatal clinic who were above the age of 18 and able to provide informed consent were recruited. Patients with mental subnormality and those who refused consent were excluded.

### Procedure

The participants were screened for depression and generalized anxiety and evaluated for associated factors. Those who screened positive were interviewed by a psychiatrist for further diagnostic evaluation using the MINI diagnostic interview schedule.<sup>20</sup> Patients who qualified for a diagnosis of depression or anxiety were referred to the psychiatry department for further management.

### Assessment and Diagnosis of Depression and Generalized Anxiety Disorder

The following instruments were used in the assessment:

- 1. The Patient Health Questionnaire (PHQ):** PHQ (validated Tamil version)<sup>21</sup> is a self-administered version of the Primary Care Evaluation of Mental Disorders (PRIME-MD) diagnostic instrument for common mental disorders. The PHQ-9 is the depression module, which scores each of the 9 Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria as 0 (not at all) to 3 (nearly every day). This is a standardized instrument, with a sensitivity of 56.7% and specificity of 88.8% for diagnosing depression. In this study, those who scored above

cut score of 10 were interviewed using the MINI.

- 2. Mini-International Neuropsychiatric Interview (MINI)-Plus Version 5.0.0:** The MINI-Plus 5.0.0 is an internationally validated brief structured interview that is used extensively as a diagnostic tool for psychiatric disorders from the DSM-IV, and the International Classification of Diseases-10. The reliability and validity of this instrument are well established.<sup>20</sup>
- 3. Generalized Anxiety Disorder-7 (GAD-7):** The GAD-7 was designed for use in primary care patients. It consists of a self-report questionnaire that allows for the rapid detection of GAD. Subjects are asked if they were bothered by anxiety-related problems over the past two weeks, by answering seven items on a four-point scale. The total scores range from 0 to 21. At a cutoff score of 9, the GAD-7 had a sensitivity of 89% and a specificity of 82% for detecting GAD compared with a structured psychiatric interview.<sup>22</sup>
- 4. Sociodemographic Pro forma:** A semi-structured pro forma with the following content was used to get information about some key associated factors: (a) *Socioeconomic status:* age (<20), educational status (<10 years school), religion (minority), unmarried, slum dwelling, employment status. (b) *Relationship with partner:* physical violence, unsupportive, alcohol-related problems, unemployed partner. (c) *Family factors:* poor support from in-laws, nuclear family, poor relationship with mother, more than three children, pressure to have male child. (d) *Reproductive health:* unwanted pregnancy, past abortion, past stillbirth. (e) *Mental health:* past or family history of mental illness

### Statistical Analysis

Statistical analysis was done using SPSS (Statistical Package for Social Sciences) version 20. The demographic and clinical data are presented in frequencies and mean and standard deviation. The chi-square and Fisher's exact tests were used to assess the significance of associations

TABLE 1.

**Distribution of Sociodemographic and Clinical Variables**

SD Variable	Mean (SD)	Range	
Age of the patient	26.00 (4.30)	18–38 years	
Age of the spouse	30.94 (3.97)	22–45 years	
Years of education	13.74 (2.96)	0–18 years	
No. of pregnancies	1.47 (0.70)	1–5	
Antenatal months	5.80 (2.25)	1–9	
		N (%)	
Occupation of patient	Housewife	171 (81.8%)	
	Working	38 (18.2%)	
Type of family	Nuclear	162 (77.5%)	
	Joint	47 (22.5%)	
Religion of the patient	Hindu	174 (83.3%)	
	Muslim	18 (8.6%)	
	Christian	17 (8.1%)	
Dwelling of the patient	Rural	12 (5.7%)	
	Semi urban	154 (73.7%)	
	Urban	43 (20.6%)	
Proximity to the hospital	<5 km	81 (38.8%)	
	5–10 km	77 (36.8%)	
	> 10 km	51 (24.4%)	
Past history of abortion	Present	23 (11%)	
	Absent	186 (89%)	
Past history of stillbirth	Present	4 (1.9%)	
	Absent	205 (98.1%)	
Trimester of pregnancy	First	39 (18.7%)	
	Second	83 (39.7%)	
	third	87 (41.6%)	
Perceived social support	Partner:	Present	168 (80.4%)
		Absent	41 (19.6%)
	Mother:	Present	180 (86.1%)
		Absent	29 (13.9%)
	In-laws:	Present	143 (68.4%)
		Absent	66 (31.6%)
Alcohol use in spouse	Present	27 (12.9%)	
	Absent	183 (87.1%)	
Physical violence	Present	9 (4.3%)	
	Absent	200 (95.7%)	
Three or more children	Present	3 (1.4%)	
	Absent	206 (98.6%)	

between categorical variables. Multivariate analysis was performed using stepwise backward logistic regression models. The sample size calculated was 207 using Epi Info (version 6.1), using the following assumptions: prevalence of antenatal depression to be 16%,<sup>4</sup> precision of 5%, with an alpha error of 5%.

## Results

All the women were married and living with their spouse. The majority of them were homemakers (179, 81.8%). Thirty-nine (18.7%) were in the first trimester, 83 (39.7%) in the second trimester, and 87 (41.6%) in the third trimester. Fifty-nine

(28.2%) women had scores of 10 or more on PHQ-9, indicating possible depression. **Table 1** shows the sociodemographic and clinical characteristics of the whole sample.

Of the 209 subjects, 59 (28.2%) were screened positive for depression with PHQ-9, and subsequently, the diagnosis was confirmed in 46 (22%) of them with MINI. Also, 49 (23.4%) were screened positive with GAD-7, and the diagnosis of GAD was confirmed in 48 (23%) with MINI. Twenty-eight subjects (13.4%) were diagnosed with both depression and GAD. Thirty-eight subjects (18.2%) had either depression or GAD and 143 subjects (68.4%) had neither.

Examining the association of the above sociodemographic and clinical characteristics with the diagnosis of depression and GAD revealed statistical significance for alcohol use in the spouse, physical violence, perceived poor support from in-laws, and pressure for a male child. **Tables 2** and **3** show the relationship of sociodemographic and clinical variables with the diagnosis of depression and GAD.

A multivariate analysis was conducted entering variables with significance ( $P < 0.05$ ) into stepwise logistic regression model. **Table 4** shows the results for depression. Women with the pressure of having a male child had four times more chance of developing depression. Poor perceived social support from in-laws and pressure to have a male child were associated with GAD. However, no single variable could predict the antenatal anxiety outcome.

## Discussion

Antenatal depression can lead to significant adverse outcomes for both the mother and the infant.<sup>3,19,23</sup> According to studies from India, the prevalence of antenatal depression varies from 1.9% to 21.6%.<sup>24,25</sup> In our study, the prevalence of antenatal depression was 49 (22%). Like other studies from Low- and middle-income countries (LAMIC), this was much higher compared to the average prevalence (of about 10%) in developed countries.<sup>3</sup> The variability in the rates across the studies could be attributed to the difference in settings, tools used, and

TABLE 2.

**Factors Associated with Depression in Antenatal Women**

Variable	Category (N)	With Depression	Without Depression	P Value
Past history of abortion	Present: 23 Absent: 186	5 (21.7%) 41 (22%)	18 (78.3%) 145 (78%)	0.607
Past history of still birth	Present: 4 Absent: 205	1 (25%) 45 (22%)	3 (75%) 160 (78%)	0.633
Trimester of pregnancy	First: 39 Second: 83 Third: 87	5 (12.8%) 23 (27.7%) 18 (20.7%)	34 (87.2%) 60 (72.3%) 69 (79.3%)	0.167
Alcohol use in spouse	Present: 27 Absent: 182	11 (40.7%) 35 (19.2%)	16 (59.3%) 147 (80.8%)	0.015*
Physical violence	Present: 9 Absent: 200	5 (55.6%) 41 (20.5)	4 (44.4%) 159 (79.5%)	0.026*
Perceived social support from in laws	Present: 29 Absent: 180	11 (37.9%) 35 (19.4%)	18 (62.1%) 145 (80.6%)	0.039*
Three or more children	Present: 3 Absent: 206	2 (66.7%) 44 (21.4%)	1 (33.3%) 162 (78.6%)	0.123
Pressure for male child	Present: 41 Absent: 168	18 (43.9%) 28 (16.7%)	23 (56.1%) 140 (83.3%)	<0.001**

Note: \*signifies P value <0.05,\*\*signifies P value <0.001.

TABLE 3.

**Factors Associated with Generalized Anxiety Disorder in Antenatal Women**

Variable	Category (N)	With Anxiety	Without Anxiety	P Value
Past history of abortion	Present: 23 Absent: 186	5 (21.7%) 43 (23.7%)	18 (78.3%) 143 (76.9%)	0.56
Past history of still birth	Present: 4 Absent: 205	0 (0%) 48 (23.4%)	4 (100%) 157 (76.5%)	0.34
Trimester of pregnancy	First: 39 Second: 83 Third: 87	4 (10.3%) 23 (27.7%) 21 (24.1%)	35 (89.7%) 60 (72.9%) 66 (75.9%)	0.96
Alcohol use in spouse	Present: 27 Absent: 182	9 (33.3%) 39 (24.1%)	18 (66.7%) 143 (78.6%)	0.131
Physical violence	Present: 9 Absent: 200	4 (44.4%) 44 (22%)	5 (55.6%) 156 (78%)	0.125
Perceived social support from in laws	Poor: 29 Good: 180	11 (37.9%) 35 (19.4%)	18 (62.1%) 145 (80.6%)	0.039*
Three or more children	Present: 3 Absent: 206	2 (66.7%) 46 (22.3%)	1 (33.3%) 160 (77.7%)	0.133
Pressure for male child	Present: 41 Absent: 168	14 (34.1%) 34 (20.2%)	27 (65.9%) 134 (79.8%)	0.041*

Note: \* signifies P value <0.05.

TABLE 4.

**Multivariate Analysis of Factors Associated with the Occurrence of Depression in Antenatal Women**

Variable	Beta Coefficient	Odds Ratio	95% CI for Odds Ratio		P Value
			Lower	Upper	
Alcohol use in spouse	0.923	3.12	0.710	13.701	0.132
Physical violence	1.138	2.51	0.966	6.561	0.059
Pressure for male child	-1.431	4.18	1.958	8.928	<0.001**

Note: \*\* signifies P value <0.001.

whether the diagnosis was based on only self-report measures or standardized diagnostic interview schedules.

The prevalence of depression we detected was also higher than the average of 16% reported from LAMIC.<sup>3</sup> The reason for this higher prevalence is unclear. Given that the sample was selected from a tertiary care hospital, one possibility is that those with obstetric complications are more likely to approach tertiary care centers, which might have contributed to the increased prevalence of depression. However, the rates of obstetric morbidity were not high in our sample and did not correlate with the prevalence of depression. The sample characteristics were comparable to those of other Indian studies from tertiary care centers in Bengaluru and Delhi, which reported a prevalence of 19% and 17%, respectively.<sup>24,26</sup> Two studies from Tamil Nadu had reported a lower prevalence of depression, around 14%<sup>27</sup> and 16.3%.<sup>4</sup> The first study<sup>27</sup> was conducted in three sites of rural Tamil Nadu, using Edinburgh Postnatal Depression Scale (EPDS), with a cutoff score of 13 for diagnosis. George et al.<sup>4</sup> conducted a community-level screening followed by a diagnostic interview and found that 16.3% of antenatal mothers had depression. Generally, obstetric centers in India are very busy, crowded, and with no privacy for conversation. In our study, care was taken to provide a private and confidential atmosphere for the participants to be screened and later interviewed. It could have led to a more open discussion about their mental state and hence, a better recognition of depressive symptoms.

The rate of alcohol use in spouses of our sample was 27 (12.9%), which was well below the prevalence of 34%<sup>28</sup> reported in the literature. It is likely that the participants under-reported the use of alcohol in their spouses, due to stigma.

Fewer studies on perinatal mental health have assessed the prevalence of anxiety. The prevalence of GAD was 48 (23%) in our sample, which is similar to Heyningen et al.<sup>29</sup> and Kang et al.<sup>30</sup>

In our sample, diagnosis of depression was associated with alcohol use in the spouse, physical violence, reduced social support from the in-laws, and

pressure for a male child. This is very similar to several other studies from LAMIC,<sup>3</sup> including India.<sup>4,27</sup> In the study by Kamali,<sup>27</sup> antenatal depression was associated with teenage pregnancies, spousal alcohol abuse, marital conflict, and perceived lack of social support. Further analysis in that study suggested that alcohol abuse could be contributing to depression by worsening marital discord and poor social support. This finding highlights how social determinants are inextricably linked to mental health issues in women. Unlike other studies,<sup>3,13</sup> in our study there was no significant association between the obstetric outcomes in the past or trimester of pregnancy.

There was a trend towards statistical significance of GAD, becoming worse in the second and third trimesters. Kang et al.<sup>30</sup> found that anemia, pregnancy-induced hypertension, and family discord were related to antenatal anxiety. In a study from South Africa,<sup>29</sup> history of mental health problems, multi-gravidity, food insecurity, unwanted pregnancies, life-threatening events, and pregnancy loss was associated with antenatal anxiety. They also found that better social support mitigated the impact of other factors. In this study, we found that anxiety was related to pressure for a male child and perceived social support but not past obstetric history.

The screening process in our study helped identify 66 women out of 207, who were offered psychological interventions, which highlighted the importance of screening antenatal women for mental health conditions.

## Limitations

We relied on a self-report instrument, and it is possible that the patients under-reported their symptoms. This also raises some concerns about the accuracy of the self-reported symptoms due to a lack of collateral information. The study design was cross-sectional, and we do not have a sense of the longitudinal course. Though we asked the subjects if they had any co-morbid medical conditions at the time of screening, no formal medical tests were conducted.

## Conclusion

Antenatal depression and anxiety are common and often not diagnosed. Screening for perinatal depression and culturally sensitive evidence-based treatment are likely to positively impact on the maternal well-being and child development. Both depression and GAD in antenatal women seem related closely to social factors. Hence, prevention and treatment approaches should include culturally appropriate psycho-social interventions integrated with existing evidence-based mental health treatments.

### Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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