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**Original article**

# Prevalence and Predictors of Depression Among Pregnant Women Attending Antenatal Clinic (ANC) in a Tertiary Health Facility in a District of West Gujarat: A Cross-Sectional Study

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## Abstract

***Background:*** Depression among pregnant women attending ANC is a prevalent and concerning issue with potential implications for maternal and fetal health outcomes. This study aims to contribute to the existing body of knowledge by examining the prevalence and predictors of depression among pregnant women in a district of West Gujarat. ***Methodology:*** The study was an Observational cross-sectional study conducted among pregnant women attending the ANC clinic of Tertiary Care Hospital, Western Gujarat during the period of Jan 2023 to May 2023. So, the Total sample of Pregnant Women was 266. ***Results:*** In the present study, the prevalence of depression was found to be 37%. Lack of partner or social support, history of abuse or domestic violence, previous history of psychiatric illness, poor marital relationship, stressful life events, a negative attitude towards the pregnancy, and lack of social support are some of the factors associated with antenatal depression. Women with a previous history of depression, Counterpart tobacco consumption status, and those who have experienced intimate partner violence are at higher risk of developing antenatal depression ($P<0.05$). ***Conclusion:*** Antenatal depression is a common mental health issue that can affect women during pregnancy. Early identification of pregnant women suffering from antenatal depression is important, and relevant support should be provided. Efforts are needed to strengthen or develop protocols for the early identification of pregnant women suffering from antenatal depression and provide relevant support.

**Keywords:** ***Antenatal Depression, ANC clinic, Antenatal Mothers, Tertiary Care Hospital.***

## Introduction

Depression is a significant mental health issue that affects individuals across various age groups and populations, including pregnant women. The prevalence of depression among pregnant women attending antenatal clinics (ANC) in tertiary health facilities has gained increasing attention due to its potential adverse effects on both maternal and fetal health outcomes.

Depression during pregnancy has been recognized as a common psychiatric disorder worldwide, with a reported prevalence ranging from 10% to 20% [1]. These figures indicate that a substantial number of pregnant women are affected by depression, making it a significant public health concern. The consequences of untreated or underdiagnosed depression in pregnancy can be severe, including adverse effects on the mother's and the developing fetus's physical and emotional well-being.

Several studies have identified various factors that contribute to the development of depression among pregnant women attending ANC. Socio-demographic factors, such as lower income, limited education, unemployment, and single marital status, have been consistently associated with an increased risk of depression [2,3]. Additionally, psychosocial factors such as lack of social support, stressful life events, history of abuse, and previous episodes of depression have also been linked to the occurrence of depression during pregnancy [4,5].

Furthermore, physiological factors, such as hormonal changes and genetic predisposition, may also play a role in the development of depression among pregnant women. Fluctuations in hormone levels, particularly estrogen, and progesterone, have been implicated in the pathophysiology of mood disorders [6]. Additionally, genetic factors, including a family history of depression or other mental illnesses, may increase an individual's susceptibility to depression during pregnancy [7].

The impact of maternal depression on pregnancy outcomes has been extensively studied. Several studies have demonstrated that untreated depression during pregnancy is associated with adverse effects on both maternal and fetal health. Maternal depression has been linked to increased risks of preterm birth, low birth weight, preeclampsia, and postpartum depression [8,9]. Moreover, children born to mothers with untreated depression may experience developmental delays, behavioral problems, and emotional difficulties later in life [10].

In India, studies have reported the prevalence of antenatal depression to range from 9.18% to 65%. A study conducted in Navi Mumbai found that the prevalence of depression during pregnancy was 40.89%. Another study in rural Bihar reported a 15-35% prevalence of postnatal depression [11].

Despite the significance of depression among pregnant women attending ANC, limited research has been conducted in the context of India. This study aims to address this research gap and provide valuable insights into the prevalence and predictors of depression among pregnant women in this region. By identifying the factors associated with depression during pregnancy, healthcare providers can develop targeted interventions and support systems to mitigate the adverse effects of depression on maternal and fetal well-being.

Depression among pregnant women attending ANC is a prevalent and concerning issue with potential implications for maternal and fetal health outcomes. This study aims to contribute to the existing body of knowledge by examining the prevalence and predictors of depression among pregnant women in a district of West Gujarat. The findings of this study will help inform healthcare policies, interventions, and support services to improve the mental health and overall well-being of pregnant women in this region

## Methodology

The study was an Observational cross-sectional study conducted among pregnant women attending the ANC clinic of Tertiary Care Hospital, Jamnagar during the period of Jan 2023 to May 2023. Sample size: The sample size was calculated using the formulae:

$N = Z^2 PQ/L^2$

Where;
Z =1.96 (at 95% confidence level or 5% level of significance)
P = Prevalence (prevalence of Depression from the reference study i.e., 21%) [12]
L = Allowable error, which was taken 5% as absolute
Q = (100 − P) = 79%

Hence, the minimum required sample size calculated $(1.96)^2 \times 21 \times (79)/5 \times 5 = 265$, the Total sample size of Pregnant Women in the study was 266.

Only those who were pregnant, attending ANC clinic, and giving consent were considered eligible for the study. Those who do not give consent, those on follow-up visits, and those assessed to be requiring urgent medical attention were excluded from the study. Informed written consent was taken in their own local language Self-structured standard questionnaires contain Socio-demographic Characteristics, Obstetric Details, Social factor, and the PHQ-9 scale (Patient Health Questionnaire -9). PHQ-9 was used to assess the depressive symptoms among Pregnant Women.PHQ-9 is a nine items tool and for every item, there is a value set from 0 to 3, with a total range of 0–27 response scale. The value is 0 (not at all), 1 (several days), 2 (more than half of the days), or 3 (nearly every day). By adding these values, the study participants will be considered depressed if the PHQ-9 score is greater than or equal to 10. The PHQ-9 appears to be a reliable and valid instrument that may be used to diagnose major depressive disorders among adults with a sensitivity of 86% and a specificity of 67% [13]. Concerning the accuracy of PHQ-9 to diagnose depression, a cut-off score of 10 or above can be used regardless of age category [14].

**Statistical Analysis**

Data which was obtained were entered in Microsoft Excel (2006). SPSS (version 26) software was utilized for statistical analysis. Descriptive data would be presented in frequencies and percentages using Tables. A bivariate analysis was conducted to determine the association between outcome variables and each independent variable. In bivariate analysis, variables whose P-value < 0.05 were considered as candidate variables for the multivariable logistic regression model to identify independent predictors by controlling confounding variables. P -value<0.05 were considered statistically significant and P-value <0.001 were considered highly significant.

## Results

**Table 1: Distribution of various socioeconomic variables among study participants (n=266)**

| Variables | *n* | Percentage (%) |
|---|---|---|
| **Age (years)** | | |
| ≤30 | 238 | 89.5 |
| >30 | 28 | 10.5 |
| **Occupation** | | |
| Working | 18 | 6.8 |
| Homemaker | 248 | 93.2 |
| **Education** | | |
| Illiterate | 88 | 33.1 |
| Literate | 178 | 66.9 |
| **Religion** | | |
| Hindu | 190 | 71.4 |
| Muslim | 76 | 28.6 |
| **Socio-Economic Class (According to modified BG prasad classification)** | | |
| Upper class | 134 | 50.4 |
| Lower Class | 132 | 59.6 |
| **Family type** | | |
| Joint | 120 | 45.1 |
| Nuclear | 146 | 54.9 |
| **Overcrowding** | | |
| Present | 128 | 48.1 |
| Absent | 138 | 51.9 |
| **House** | | |
| Owned | 214 | 80.5 |
| Rented | 52 | 19.5 |

In this study, out of 266 participants, 90% were below and equal to 30 years of age, only 7 % were working,33% were illiterate, and 60 % were lower class (According to modified BG prasad class, Class 1 and 2 were considered as Upper class and Class 3,4 5 were considered as a Lower class), and 80 % lives in an owned house.

**Table 2: Association between Socio-demographic characteristics and prenatal depression.**

| Variable | depression (*n*=97) | No depression (*n*=169) | P-value | COR(CI) | AOR(CI) |
|---|---|---|---|---|---|
| **Age (years)** | | | | | |
| ≤30 | 85(88) | 153(91) | | | |
| | | | 0.458 | 0.7(0.3-1.6) | - |
| >30 | 12(12) | 16(9) | | | |
| **Occupation** | | | | | |
| Working | 5(5) | 13(8) | | | |
| | | | 0.428 | 1.5(0.5-4.4) | - |
| Homemaker | 92(95) | 156(92) | | | |
| **Education** | | | | | |
| Illiterate | 40(41) | 48(28) | | | |
| | | | 0.032* | 1.7(1.05-2.9) * | 1.7(1.1-2.9) * |
| Literate | 57(59) | 122(72) | | | |
| **Religion** | | | | | |
| Hindu | 62(64) | 128(76) | | | |
| | | | 0.04* | 1.76(1.02-3.03) * | 0.56(0.34-1.08) |
| Muslim | 35(36) | 41(24) | | | |
| **Socio-Economic Status (Modified BG prasad Classification)** | | | | | |
| Upper Class (Class-1 &2) | 57(59) | 77(46) | | | |
| | | | 0.038* | 1.70(1.03-2.82) * | 2.56(1.4-4.5) * |
| Lower Class (Class 3,4 &5) | 40(41) | 92(54) | | | |
| **Family type** | | | | | |
| Joint | 36(37) | 84(50) | | | |
| | | | 0.047* | 1.67(1.01-2.79) * | 2.009(1.2-3.6) * |
| Nuclear | 61(63) | 85(50) | | | |
| **Overcrowding** | | | | | |
| Present | 55(57) | 73(43) | | | |
| | | | 0.034* | 1.7(1.04-2.85) * | 0.478(0.2-0.8)* |
| Absent | 42(43) | 96(57) | | | |
| **House** | | | | | |
| Owned | 79(81)) | 135(80) | | | |
| | | | 0.757 | 1.11(0.586-2.09) | - |
| Rented | 18(19) | 34(20) | | | |

*COR-Crude Odds Ratio, AOR-Adjusted Odds Ratio, P-value<0.05*, P<0.001***

Table 2 shows the Association between Socio-demographic characteristics and Antenatal depression, which shows Education, religion, Socioeconomic status, Family type, and overcrowding were Statistically Associated with Antenatal depression in bivariate analysis but while in multivariate analysis education, socioeconomic class, family type, and overcrowding were associated. Illiterate was 1.7 times the odds of getting depression than literate, Nuclear families have 2 times the odds of getting Antenatal depression than Joint families. The OR of 0.478 suggests that participants without overcrowding had 0.478 times lower odds of having depression compared to those in overcrowding. Regarding socioeconomic status lower class participants have 2.5 times the odds of getting depression than the upper class.

**Table 3: Obstetric factors and gender issues in prenatal depression (n=266)**

| Variables | Depression (*n*=97) | No depression (*n*=169) | p-value | COR(CI) | AOR(CI) |
|---|---|---|---|---|---|
| **Age at marriage (years)** | | | | | |
| ≤18 | 22(23) | 21(12) | | | |
| | | | 0.02* | 2.07(1.07-4) | 2.(1.2-4.2) * |
| >18 | 75(77) | 148(88) | | | |
| **Gravida** | | | | | |
| 1 | 36(37) | 85(50) | | | |
| | | | 0.03* | 1.7(1.02-2.85)* | 0.94(0.5-1.7) |
| >1 | 61(63) | 84(50) | | | |
| **Trimester** | | | | | |
| First trimester | 1(1) | 25(15) | 0.02* | 23.4(3.05-180) | 23(2.8-190) * |
| Second trimester | 45(46) | 48(28) | 1 | 1 | 1 |
| Third trimester | 51(53) | 96(57) | 0.036* | 1.76(1.039-3) | 1.62(1.1-2.85) * |
| **History of abortion** | | | | | |
| Yes | 26(27) | 26(15) | | | |

| | | | | | |
|---|---|---|---|---|---|
| | | | 0.02* | 2.(1.09-3.72)* | 1.26(1.1-2.6) * |
| No | 71(73) | 143(85) | | | |
| **Pregnancy planned or not** | | | | | |
| Planned | 78(80) | 151(89) | | | |
| | | | 0.04* | 2.(1.01-4.12) * | 1.84(1.2-3.9) * |
| Unplanned | 19(20) | 18(11) | | | |
| **Pregnancy wanted or not** | | | | | |
| Wanted | 96(99) | 168(99) | | | |
| | | | 0.69 | 1.75(0.108-28.3) | - |
| Unwanted | 1(1) | 1(1) | | | |
| **Pressure for a male child** | | | | | |
| Yes | 20(21) | 16(9) | | | |
| | | | 0.011* | 2.46(1.2-5)* | 0.54(0.23-1.21) |
| No | 77(79) | 152(91) | | | |

Table 3 Shows the Association between Obstetric factors and gender issues with Antenatal depression, Age at Marriage, Gravida, Trimester, History of Abortion, Pregnancy planned, and pressure of the male child were Statistically significant with Antenatal Depression in bivariate analyses but the age at marriage, trimester, history of abortion, pregnancy planned were only associated in multivariate analyses. Age at Marriage was Statistically Associated with Antenatal depression with an OR of 2.1 which means Marriages less than and equal to 18 years were 2.1 times odd of getting Antenatal depression than Marriages more than 18 years, Women with more than 1 gravida were 1.7 times odds of getting depression than one gravida, Women with Abortion have 1.26 times odds of getting Antenatal depression than Women with no abortion history, Women who don't have planned pregnancy have 1.84 times odds of getting Antenatal depression than women with a planned pregnancy, pressure of male child have 2.46 times odds of getting Antenatal depression than with women with no pressure of male child. Taking the second trimester as a reference the amount of depression was 23 times higher in the first trimester and 1.62 times higher in the third trimester.

**Table 4: previous psychiatric history, and Social Factors in prenatal depression (n=266)**

| Variables | Depression (*n*=97) | No depression (*n*=169) | p-value | COR(CI) |
|---|---|---|---|---|
| **History of personal psychiatric illness** | | | | |
| Yes | 11(11) | 8(4) | | |
| | | | 0.024* | 2.5(1.1-6.6) |
| No | 86(89) | 161(96) | | |
| **Support from parents** | | | | |
| Yes | 92(95) | 168(99) | | |
| | | | 0.026* | 9.13(1.05-79) |
| No | 5(5) | 1(1) | | |
| **Support from spouse** | | | | |
| Yes | 91(94) | 168(99) | | |
| | | | 0.01* | 11(1.31-93.4) |
| No | 6(6) | 1(1) | | |
| **Support from in-laws** | | | | |
| Yes | 90(93) | 167(99) | | |
| | | | 0.013* | 6.49(1.32-31.9) |
| No | 7(7) | 2(1) | | |
| **History of alcoholism in spouse** | | | | |
| Yes | 5(5) | 1(1) | | |
| | | | 0.026* | 9.1(1.05-79.3) |
| No | 92(95) | 168(99) | | |
| **History of violence/abuse in the family** | | | | |
| Yes | 8(8) | 4(2) | | |
| | | | 0.034* | 3.7(1.08-12.65) |
| No | 89(92) | 165(98) | | |
| **History of Tobacco** | | | | |
| Yes | 49 | 64 | | |
| | | | 0.045* | 1.67(1.01-2.77) |
| No | 48(49) | 105(62) | | |

Table 4 Shows the Association between Previous history of psychiatric illness, social factors, and antenatal depression. History of previous psychiatric illness, support from parents, in-laws ,spouse, history of alcoholism, tobacco consumption in spouse , history of domestic violence were statistically significant with the antenatal depression, and History of personal psychiatric illness was Statistically Associated with Antenatal depression with an OR of 2.5 which means Women with the history of personal psychiatric illness were 2.5 times odd of getting Antenatal depression than women with no history of psychiatric illness, Women without support from parents were 9.1 times odds of getting depression than women with support from parents, Women without support from spouse have 11

times odds of getting Antenatal depression than Women with support from spouse, Women without support from in-laws have 6.5 times odds of getting Antenatal depression than women with support from in-laws, women with spouse with alcoholism have 9.1 times odds of getting Antenatal depression than with women with spouse with no history of Alcoholism, Women with presence of Domestic violence were having 3.7 times of getting Antenatal depression than with women without a history of domestic violence , Women with a spouse of having Tobacco history were having 1.67 times odds of getting Antenatal depression than with women with spouse no Tobacco history.

## Discussion

In the present study, the prevalence of depression was found to be 37%. the prevalence of antenatal depression varies significantly across different populations and settings. Comparing this to previous studies, in India, the prevalence of antenatal depression ranges from 1.9% to 21.6% [15]. In Australia, the prevalence of antenatal and postnatal depressive symptoms was 6.2% and 3.3% of the cohort, respectively [16]. Globally, the prevalence of antenatal depression ranges from 7% to 20% in each trimester of pregnancy [17]. In the US, the prevalence of any antenatal depression was found to be 20.7%, with 15.0% of pregnant women experiencing major antenatal depression [18]. The variation in prevalence rates across different studies could be attributed to differences in study populations, methodologies, and screening tools used for diagnosing depression. Additionally, various risk factors such as lack of partner support, history of intimate partner violence, lower socioeconomic status, and cultural differences may contribute to the differences in prevalence rates [19].

It is important to note that the high prevalence of depression in the current study (37%) is considerably higher than most of the rates reported in the studies mentioned above. This could be due to differences in the study population or methodology, or it could indicate a particularly high prevalence of depression in the present population.

In the current study, Antenatal Depression is associated with Educational level, Socioeconomic status, Overcrowding, and family type ($P<0.05$), this finding can be compared with the previous studies which were done by the Centers for Disease Control and Prevention (CDC) found that lower educational attainment was associated with increased risk of depressive symptoms, suggesting that this association may persist independent of other social and genetic factors [20], Another study found that higher levels of educational attainment protect against depressive symptoms, as education is positively associated with factors thought to protect against symptoms of depression [21]. A study conducted in Europe found that low socio-economic status (SES) was associated with a higher prevalence of depression [22]. A study conducted among Nunavik Inuit adolescents found that household overcrowding was associated with psychological distress, including depressive symptoms [23].

Antenatal depression was also associated with Marriage < 18 years of age, History of Abortion, and pressure on male children which was consistent with previous studies, Marital status has also been linked to antenatal depression. One study found that antenatal depression was associated with marriage at less than 18 years [24]. Additionally, a history of abortion has been associated with an increased risk for postpartum psychiatric disorders, including depressive affect [25,26]. A study conducted in South India found that pressure to have a male child was associated with a generalized anxiety disorder (GAD) and depression during pregnancy [24].

The present study also explains the social factors which are responsible for prenatal depression, which was support from in-laws, spouse, and Parents, additionally, it was also associated with a history of alcoholism, Tobacco consumption from a spouse, and history of Domestic violence, which were consistent with the previous studies According to a systematic review, the most relevant factors associated with antenatal depression or anxiety were lack of a partner or social support, history of abuse or domestic violence, previous history of psychiatric illness, poor marital relationship, stressful life events, a negative attitude towards the pregnancy, and lack of social support [27].

Domestic abuse and mental health disorders are strong risk factors for perinatal depression. Women with probable antenatal depression were three times more likely to have experienced domestic abuse in their lifetime and five times more likely to have experienced domestic abuse during pregnancy [28]. In addition, a study conducted in Australia found that early professional support can help women with antenatal depression recover sooner. Emotional and practical support from partners can also help women with antenatal depression [29].

## Conclusion

Antenatal depression is a common mental health issue that can affect women during pregnancy. Lack of partner or social support, history of abuse or domestic violence, previous history of psychiatric illness, poor marital relationship, stressful life events, a negative attitude towards the pregnancy, and lack of social support are some of the factors associated with antenatal depression. Women with a previous history of depression, Counterpart tobacco consumption status, and those who have experienced intimate partner violence are at higher risk of developing antenatal depression. Early professional support and emotional and practical support from partners can help women with antenatal depression recover sooner.

## Limitations of the study

- The study is cross-sectional, which means that it only provides a snapshot of depression prevalence and predictors at a specific point in time, and cannot establish causality
- The study was conducted in a specific district or region, which may limit the generalizability of the findings to other settings
- The study relied on self-reported data, which may be subject to recall bias and social desirability bias
- The study did not assess the impact of depression on maternal and fetal outcomes

## Recommendations of the study

- Early identification of pregnant women suffering from antenatal depression is important, and relevant support should be provided
- Efforts are needed to strengthen or develop protocols for the early identification of pregnant women suffering from antenatal depression and provide relevant support
- Healthcare providers should be trained to identify and manage antenatal depression and to provide appropriate referrals for women who need more intensive treatment
- Further research is needed to identify effective interventions for preventing and treating antenatal depression and to assess the impact of depression on maternal and fetal outcomes

## Ethical Approval and Consent to participate

The study was conducted after ethical approval from the Institutional Ethical Committee Of the institute, Ref number (92/01/2023), and Written Informed Consent was taken in their Vernacular Language.

## Conflicts of Interest

No

## Funding Statement

None

## Authors' Contributions

All Authors equally Contributed to making the manuscript, all authors read and approved the final Manuscript.

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