



## **Prevalence of Depression among Antenatal Women in Sriperumbudur, Chennai**

**Jayashree Kannappan <sup>a#</sup>, Abhilash Kannappan <sup>b\*</sup>, V. S. Prema Subathiraa <sup>ct</sup>,  
Shanthi Dinakaran <sup>a‡</sup> and P. S. Jikki Kalaselvi <sup>a¥</sup>**

<sup>a</sup> Department of OBG, ACS Medical College and Hospital, Velappanchavadi, Chennai–600077, India.

<sup>b</sup> Hairmyres University Hospital, Glasgow, United Kingdom.

<sup>c</sup> Department of Psychiatry, Meenakshi Medical College and Hospital, Kancheepuram, India.

### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

### **Article Information**

DOI: 10.9734/JPRI/2021/v33i50B33459

#### Editor(s):

- (1) Dr. Rafik Karaman, Al-Quds University, Palestine.  
(2) Dr. Ana Cláudia Coelho, University of Trás-os-Montes and Alto Douro, Portugal.

#### Reviewers:

- (1) Saapiire Ferguson, St. Joseph Nursing Training College, Ghana.  
(2) Yadeta Alemayehu, Mettu University, Ethiopia.  
(3) V. R. Revathy, Anna University, India.

Complete Peer review History: <https://www.sdiarticle4.com/review-history/77381>

**Original Research Article**

**Received 08 September 2021**

**Accepted 16 November 2021**

**Published 20 November 2021**

## **ABSTRACT**

**Background:** Women are twice as likely as males to suffer from mood disorders, which tend to cluster around the childbearing years. Depression negatively influences maternal and neonatal outcomes.

**Objective:** The objective of the study is to estimate the prevalence of depression in pregnant women aged 18 – 35 yrs and to identify predictors accounting for variability across estimates during pandemic.

**Methodology:** This is a cross sectional study, conducted among 74 pregnant women coming for antenatal checkups in the Sriperumbudur, Chennai. Using height and weight values obtained from the sample, Body Mass Index (weight in kg/height in metre squares) was calculated. Hamilton – Depression Scale (HAM-d) was applied after initial psychiatry work up to all women who were

# Assistant Professor

† Postgraduate

‡ Professor and HOD

¥ Professor

selected for the interview. Mean of parameters were assessed and correlation value were calculated by Fisher's exact test. The statistically significant P value was less than 0.05.

**Results:** The sociodemographic variables have been found as significant contributors in explaining the variability of the prevalence rates of antenatal depression. It showed positive correlation between economic status and depression ( $p < 0.05$ ) and a negative correlation between obesity and depression ( $p > 0.05$ ). According to the findings, fewer than 1/3rd of pregnant women experience depression as a result of life circumstances such as economic crises in order to support their families. These were identified as significant associate variables ( $P > 0.05$ ). And also, this study identified insufficient socioeconomic assistance were more likely to experience multiple psychological discomfort [atleast 1] than women who got appropriate economic support. ( $r = -0.118, P < 0.001$ )

**Conclusion:** In rural Tamilnadu, the prevalence of antenatal depression among women is significant. Antenatal Depression is caused by a number of circumstances, including physical, obstetric, economic, and family-related issues. To treat these antenatal depression risk factors, comprehensive therapies are required.

*Keywords: Antenatal; depression; socio economic; Hamilton depression scale; demographic profiles.*

## 1. INTRODUCTION

Pregnancy and depression affect each other. In the background of chronic life stressors, women may have difficulty in coping with the additional demands of pregnancy. Many women, particularly those living in poverty or having dependent children, may have a negative view of pregnancy. Memories of poor parenting or abuse, the women have suffered may resurface and cause distress. Domestic conflicts also lead to emotional problems. Maternal mental state in pregnancy may have significant impact on the mental and behavioural of the offsprings [1,2,3].

The prevalence of prenatal depression is estimated to be 10–15% in developed countries and 19–25% in low-income countries. Women who experience antenatal depression often continue to have depressive symptoms in the post-partum period [4,5].

Weight is frequently communicated as far as Body Mass Index (BMI). Obese individuals differ not only in the amount of excess fat that they store, but also in the regional distribution of the fat within the body. Perhaps, obesity has become more prevalent form of malnutrition. It is both disease and a major risk that may develop many other morbidities. Incidence of obesity in both developed and developing countries is increasing, affecting pregnant women as well as new borns. Improper diet pattern, reduced levels of physical activity, sedentary lifestyle and ethnicity are key factors affecting and primarily causing obesity [6,7].

Yoga and meditation have been shown to be beneficial to depressed pregnant women's obese

complaints, which may help them to feel healthy, as obese is a common cause of mental disturbance during pregnancy. According to recent study on the benefits of yoga on reducing depressive symptoms in depressed pregnant women, yoga is a safe, realistic, and acceptable strategy that may offer advantages over traditional depression therapy (eg: medications) [8].

Fear, Insomnia, worry, depression and anxiety during pregnancy has negative physical and psychological health consequences for pregnant women. Previous studies suggest that pregnancy stress may lead to mother-infant relationship disorder, antenatal and postpartum depression, increased physical problems, and an increased risk of pre-eclampsia [9].

Several studies have attempted to understand the nature of worries in pregnant women and have developed scales to measure the nature and the extent of pregnant women's worries. Results of these studies indicate that pregnant women's worries originate from different sources. These sources can be classified as socio-medical, socio-economic, the health of the fetus, mother's own health and relational issues [10]. Women who have supporting networks of friends and family may be less stressed and have better mental health. Poor family ties and a lack of social support, on the other hand, may be linked to anxiety symptoms.

Hence, the current study sought to determine the incidence of prenatal depression and its risk factors among pregnant women at Antenatal health care, Sriperumbudur, Chennai, India.

## 2. METHODOLOGY

### 2.1 Study Design

Cross sectional study.

#### 2.1.1 Study population

Pregnant women attending the antenatal clinic at the Sriperumbudur, Chennai, India.

#### 2.1.2 Inclusion criteria

Pregnant Women attending the antenatal clinic.

#### 2.1.3 Exclusion criteria

Pregnant Women with serious medical conditions and who are in labour were excluded

#### 2.1.4 Sample size

74.

#### 2.1.5 Study period

April 2021 to October 2021.

### 2.2 Data Collection Tools

1. Socio demographic and Obstetric data collected while investigation.
2. BMI of individuals of the sample were calculated using this method with their assessed height and weight measure
3. Hamilton Depression Scale [HAM-D] - Although HAM-D is still extensively used as a clinical trial outcome measure, it has been criticised for its often-inadequate capacity to distinguish between anxiolytic and antidepressant effects, as well as somatic depression versus somatic side effects. The HAM-D does not include any standardised information. Regardless, the scale's indicated levels of interrater reliability appear to be satisfactory.

### 2.3 Statistical Analysis

The data collected was entered in MS Excel and analyzed using SPSS 16 version. The demographic data was presented as frequencies and Percentage. The categorical variables were associated with the outcome [Antenatal depression]. Fischer exact two-sided test was used to evaluate the relationship between socioeconomic level and BMI to depression. The association between perceived economic support

level and the six forms of mother psychological distress was investigated using Spearman correlation analysis.

## 3. RESULTS

74 pregnant women were included in the study. They were in the reproductive age group of 18 to 40 years.

### 3.1 Socio Demographic Characteristics of the Study Population

The sociodemographic factors of age, economic status, marital status, hobbies, BMI, gestational age and Gravida have been identified as important factors in explaining the variability of the prevalence rates of antenatal depression. [Table 1].

### 3.2 Correlation between Antenatal Depression and Various Associated Factors

Out of 74 women in whom HAM-D questionnaire was applied, 8 patients had the score value 7 i.e. 20% of the pregnant women had some form of depression. [Table: 1].

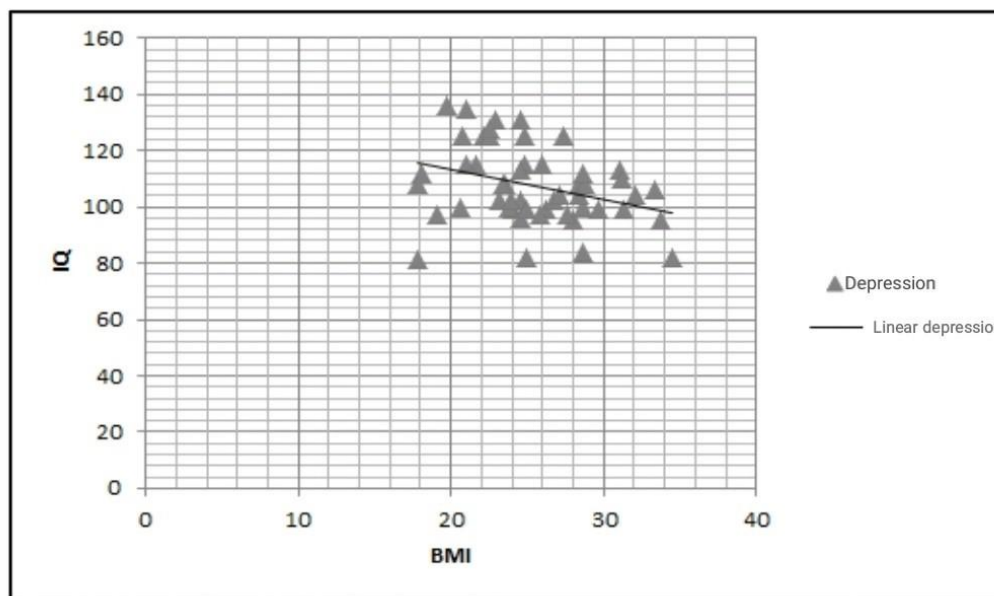
Patients came for the prevalence study of antenatal depression among first trimester women was 4 % while it was 46 and 50 % among second and third trimester women respectively. The reason for the limited number of patients in the first trimester is that all three patients were multigravida at < 12 weeks. This indicates they are not aware of the importance of prenatal care.

Although the factors of age, gestational age, BMI and gravida show no significant relationship with the frequency of antenatal depression, it is possible that these groups are better aware of the necessity for frequent checkups and have less stigma associated with seeking psychiatric assistance.

Generally, Tamilnadu government provides free yoga sessions to pregnant women in rural areas. As a result, the majority of unemployed women use this as hobbies. Women with different interests may experience depression at a lower rate. As a result, obesity and depression were shown to have a negative connection ( $r = -0.326$ ). The found association, however, was statistically insignificant, as demonstrated in Table 1 and Fig. 1.

**Table 1. Prevalence of antenatal depression across socio demographic factors in the study population (N=74)**

Variables	Frequency	%	No depression <7	Depression >7	Fisher 2 sided	P value
<b>Age</b>						>0.05
18-20	14	19%	23	1		
21-30	37	50%	35	2		
31-40	23	31%	18	5	0.07	
<b>Marital status</b>					0.03	<0.05
Married	70	95%	66	4		
Unmarried	4	5%	2	2		
<b>BMI</b>	34	46%	31	3	0.27	>0.05
<b>Hobbies</b>					0.02	<0.05
Drawing	2	3%	2	0		
Yoga and meditation	66	89%	66	0		
Embroidering	3	4%	2	1		
No hobbies	3	4%	3	0		
<b>Socioeconomic class</b>						<0.05
Lower middle	47	63%	41	6		
Upper middle	25	34%	22	3		
Upper	2	3%	1	1	0.34	
<b>Gravida</b>						>0.05
Primi	26	35%	22	4		
Multi	48	64.8%	44	4	0.44	
<b>Gestational age</b>						>0.05
<12 weeks	3	4%	1	-		
12 to 28 weeks	34	46%	31	3		
.>28 weeks	37	50%	35	5	0.26	



**Fig. 1. The linear relationship (negative correlation) between BMI and Depression. (r = -0.324, p>0.05)**

### 3.3 Socio Economic Status [SES] of the Study Population

The socio economic status varies with the composition of the study population. About 44.5% women belong to lower middle income family. Socio-economic status of the respondents with depression was significant on Fischer's 2-sided test ( $p$ -value >0.05).

### 3.4 Distribution of Symptoms in Antenatal Depression [N=8]

The clinical signs of depression were more general somatic symptoms and lack of appetite, which was consistent with depression research in

this area of the globe, the rationale being the acceptance of somatic problems and the stigma of mental problems.

### 3.5 Psychological Distress

Women with low income and less family financial support reported significantly higher rates of psychological distress than women with strong family financial support. Among women with lower middle economic support [n=33], 41.8% reported depression, 31.1% reported tension, 8.2% reported insomnia, 10.6% reported somatization and 8% reported fear. [Table:3]  $p$  value <0.001 considered statistically significant.

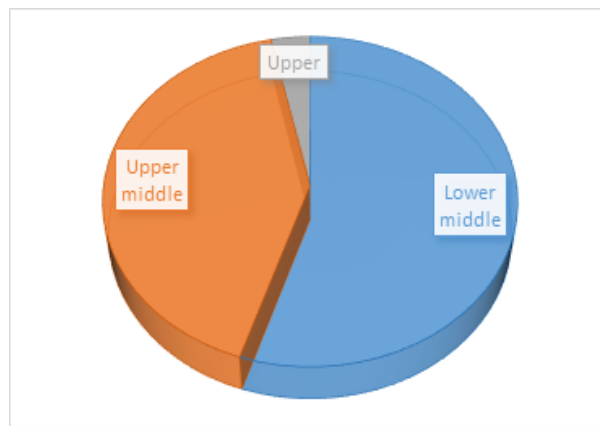


Fig. 2. Pie chart of SES distribution in study group (N=74)

Table 2. Symptoms Distribution

Symptoms	Frequency
General somatic symptoms	4 (50%)
Anxiety psychic symptoms	1(12.5%)
Low mood(sadness, hopelessness)	1(12.5%)
Retarded work/ activities	3 (37.5%)
Anxiety somatic symptoms	2 (25%)
Insomnia	1(12.5%)
Suicidal ideation	0 (0%)
Decreased appetite and GI symptoms	5 (62.5%)
Feeling of guilt	4 (50.0%)
Agitation	1 (12.5%)

Table 3. Self-reported psychological distresses of pregnant women with lower middle economic status, n (%)

Psychological measures	Total [n=33]	F/X <sup>2</sup>	P value	r
Depression	14	22.17	<0.001	-0.118
Tension	9	17.21	0.002	-0.211
Fear	3	3.41	0.003	-0.098
Insomnia	3	3.26	0.032	-0.034
Somatization	4	3.76	0.002	-0.024

#### 4. DISCUSSION

The aim of our study was to estimate the prevalence of perinatal depression and the risk factors associated with PND among women in rural Bihar, North India.

Antenatal depression can have serious consequences for both the mother and the newborn. According to Indian research, the prevalence of prenatal depression ranges from 1.9 to 21.6 % [11]. The prevalence of antenatal depression in our research was 41%. This was substantially higher than the typical prevalence (of roughly 10%) in industrialised nations, [12] according to earlier research from low- and middle-income countries (LAMIC). The differences in rates across studies might be due to differences in settings, techniques utilised, and whether the diagnosis was based only on self-report measures or established diagnostic interview schedules.

Previous studies, the Chennai Urban Rural Epidemiology Study (CURES) in Tamil Nadu, South India, and another from Vidharba, Central India, found that depression was prevalent in 16.3 % and 16.7 % of females, respectively. [13] Despite the fact that both of these investigations utilised patient health questionnaires (PHQ-9 and HAM D) to screen for depression, the estimated prevalence of depression is comparable to our study, which used HAM D.

Another recent study [14] compared the variation in estimation of depression prevalence using DASS-21 and HAM D in the same group of subjects and found that HAM D is a better case finding tool with higher specificity and positive predictive value, whereas DASS 21 is a good screening tool with higher sensitivity and negative predictive value. As a result of using HAM D, our study may have categorised fewer mildly depressed patients as normal, underestimating the prevalence.

A few studies have examined the association between BMI and antenatal depression in pregnant women, with findings ranging from mild to heavy. Some longitudinal analyses showed higher body composition with more rapid decline on measures of global functioning, executive function and memory over time growing number of studies demonstrating that obesity is an independent factor for poor neuro-cognitive outcome another point to take interest is pregnant obesity, which has reached epidemic

levels over nations. Overweight and obese in pregnancy are known to have significant impact on physical and psychological health. Overweight and obesity are assumed to be the results of increased calorie and fat intake with steady decline of physical activity being the major roles in the rising rates of obesity all around the world. Both overconsumption of calories and reduced physical activity are involved in antenatal obesity [15]. To address these issues, the Indian government offers free yoga sessions to pregnant women in both urban and rural areas. The current study aimed to raise awareness among pregnant women that engaging in hobbies like as yoga and meditation is beneficial to their health and may also help them cope with stress and despair.

However, both these studies additionally identified lower SES as an associated factor for depression and this association was not reflected in our study. One of the reasons we hypothesize here is Chennai is a capital city of Tamil nadu and offers better support for economically backward people, through social welfare schemes and through a system of lesser taxation, when compared with the other districts. Second, people of chennai are at advantage for availing free or subsidized healthcare from the many medical colleges located here [16].

Sanchana et al., 2020 study did not find association of prevalence of depression, anxiety and stress with the literacy and economic levels of the term antenatal mothers who participated in their study [17] which was in contrast to present findings of a study involving women at Chennai, which evidenced that women with inadequate income had higher risk of depressive symptomatology [Psychological distress].

This study offers a few advantages. This is one of the few studies that provides a community-based estimate of depression among women in reproductive age group. The study tool was HAM D, which has high psychometric qualities and has been evaluated in several contexts in India across a wide range of age groups. Another possible strength of our study is that the interview was performed by trained MBBS interns during pandemic, who gave greater explanations for any questions that arose during the interview, which is not the case in other studies that utilise field research officers to gather data.

## 5. CONCLUSION

Pregnancy is very crucial period not only for mother but whole family. This study has shown moderate frequency of depression among the participants. There is a need for a longitudinal study to design interventions that can address emerging burden of antenatal depression among pregnant women living in rural settings. Women with limited financial assistance from their families were more likely to experience depression, sleeplessness, despair, tension, and worry. Antenatal depression is linked to a history of anxiety, a poor socioeconomic level, and multiple pregnancy.

## 6. RECOMMENDATIONS

Longitudinal studies are required to assess the incidence of prenatal depression and to investigate the risk and protective variables that contribute to it. Based on these findings, interventional research focusing on crucial, locally relevant risk and protective variables for prenatal depression must be conducted in order to improve mother and child outcomes in the short and long run.

## 7. LIMITATIONS

We used a self-report tool, therefore it's likely that the patients under-reported their symptoms. Due to a lack of collateral information, this also raises some questions regarding the veracity of self-reported symptoms. We don't know what happened in the long run because the study was cross-sectional. At the time of screening, we questioned the individuals if they had any comorbid medical problems, but no official medical testing were performed.

## CONSENT AND ETHICS APPROVAL

The study was approved by the Institutional Ethics Committee (IEC) of ACS Medical College (Ref: No. 322/2021/IEC/ACSMCH Dt. 9.9.2021). Participants were informed about the purpose of the study. Written informed consent was obtained. The participants were assured that the information obtained will be for research purposes and would therefore be anonymous and kept strictly confidential.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Haga SM, Drozd F, Lisøy C, Wentzel-Larsen T, Slinning K. Mamma Mia—a randomized controlled trial of an internet-based intervention for perinatal depression. *Psychological Medicine*. 2019;49(11):1850-8.
2. Avraham L, Tamar W, Eyal S, Gali P. Perinatal outcomes and offspring long-term neuropsychiatric hospitalizations of mothers with anxiety disorder. *Arch Womens Ment Health*; 2020.
3. Hermon N, Wainstock T, Sheiner E, Golan A, Walfisch A. Impact of maternal depression on perinatal outcomes in hospitalized women—a prospective study. *Archives of women's mental health*. 2019;22(1):85-91.
4. Zhang L, Yang X, Zhao J, Zhang W, Cui C, Yang F, Ma R, Jia Y. Prevalence of prenatal depression among pregnant women and the importance of resilience: a multi-site questionnaire-based survey in Mainland China. *Frontiers in psychiatry*. 2020;11:374.
5. Dadi AF, Miller ER, Woodman R, Bisetegn TA, Mwanri L. Antenatal depression and its potential causal mechanisms among pregnant mothers in Gondar town: application of structural equation model. *BMC pregnancy and childbirth*. 2020;20(1):1-5.
6. Matthies LM, Müller M, Doster A, Sohn C, Wallwiener M, Reck C, Wallwiener S. Maternal–fetal attachment protects against postpartum anxiety: The mediating role of postpartum bonding and partnership satisfaction. *Archives of gynecology and obstetrics*. 2020;301(1):107-17.
7. Srinivasan M, Reddy MM, Sarkar S, Menon V. Depression, Anxiety, and Stress among Rural South Indian Women—Prevalence and Correlates: A Community-Based Study. *Journal of neurosciences in rural practice*. 2020;11(01):078-83.
8. Beddoe AE, Paul Yang CP, Kennedy HP, Weiss SJ, Lee KA. The effects of mindfulness-based yoga during pregnancy on maternal psychological and physical distress. *J Obstet Gynecol Neonatal Nurs*. 2009;38(3):310-9. DOI: 10.1111/j.1552-6909.2009.01023.x. PMID: 19538619.
9. Atif M, Halaki M, Raynes-Greenow C, Chow CM. Perinatal depression in

- Pakistan: A systematic review and meta-analysis. *Birth*. 2021;48(2):149-63. Available: <https://doi.org/10.1111/birt.12535>
10. Rahaney V, Faye A, Tadke R, Gawande S, Bhawe SH, Kirpekar VC. Postpartum depression and its risk factors: A cross-sectional exploratory study. *Annals of Indian Psychiatry*. 2021 Jan 1;5(1):36. DOI: 10.4103/aip.aip\_3\_21
  11. Beyene, G.M., Azale, T., Gelaye, K.A. et al. Depression remains a neglected public health problem among pregnant women in Northwest Ethiopia. *Arch Public Health* 2021;79:132. Available: <https://doi.org/10.1186/s13690-021-00649-6>
  12. Floyd, Georgina. "Improving Postpartum Depression Screening and Education for Postpartum Women in an Obstetrics and Gynecology Clinic." PhD diss., Grand Canyon University, 2021.
  13. Biaggi A, Conroy S, Pawlby S, Pariante CM. Identifying the women at risk of antenatal anxiety and depression: A systematic review. *J Affect Disord*. 2016; 191:62-77. DOI:10.1016/j.jad.2015.11.014
  14. Shrivastava SR, Shrivastava PS, Ramasamy J. Antenatal and postnatal depression: A public health perspective. *Journal of neurosciences in rural practice*. 2015;6(01):116-9.
  15. Battle CL, Uebelacker LA, Magee SR, Sutton KA, Miller IW. Potential for prenatal yoga to serve as an intervention to treat depression during pregnancy. *Womens Health Issues*. 2015;25(2): 134-41. DOI: 10.1016/j.whi.2014.12.003. PMID: 25747520; PMCID: PMC4393850.
  16. Sundari AS, Subramaniam S. A prospective study to find the effect of antepartum depression on the outcome of pregnancy and infant growth in Chennai. *National Journal of Research in Community Medicine*. 2019;8(3): 199-204.
  17. Sanchana A, Ethirajan S, Iniyan Selvamani DG. Assessment of the prevalence of depression, anxiety and stress symptoms in term antenatal women—a tertiary care center experience during covid-19 pandemic. *Annals of Tropical Medicine and Public Health*. 2020;23:232-372.

© 2021 Kannappan et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*  
The peer review history for this paper can be accessed here:  
<https://www.sdiarticle4.com/review-history/77381>