ORIGINAL RESEARCH ARTICLE

Rural-Urban Antepartum Depression in Khordha District, Odisha, India: Prevalence, Risk Factors, and Social Support

Deepanjali Behera[1], Manas Ranjan Behera[2*], Magnus Michael Sichalwe[3], Simanchal Behera[4]

[1,2]School of Public Health, Kalinga Institute of Industrial Technology (KIIT) Deemed to be University, Bhubaneswar, Odisha, India
[3]School of Public Health, Nantong University, Jiangsu, China
[4]Department of Library & Information Science, School of Liberal Studies, Kalinga Institute of Industrial Technology (KIIT) Deemed to be University, Bhubaneswar, Odisha, India

DOI: 10.55489/njcm.170320266211

ABSTRACT

Background: Depression during pregnancy (Antepartum Depression (APD)) is a major global health concern, affecting maternal, neonatal, and family well-being, yet often remains undetected and untreated. Early identification is essential to prevent adverse outcomes. This study compared APD prevalence between urban and rural regions of Khordha district, Odisha, and examined associated risk factors.

Methods: A community-based cross-sectional study was conducted among 363 pregnant women (≥18 years) using multistage sampling, with 136 rural and 227 urban participants. Data were collected via a pretested questionnaire and PHQ-9 (score ≥10 indicating APD). Social support was measured using the MSPSS, and logistic regression in SPSS v25 identified crude and adjusted predictors of APD at $p<0.05$.

Results: Overall, APD prevalence was 14.9%, significantly higher in urban (20.3%) than rural (5.9%) women. Urban women reported lower family support, while friends and significant other support were similar across settings. Significant risk factors included urban residence (AOR=3.2, 95% CI: 1.4-7.1), low household income (AOR=2.1, 95% CI:1.1-4.2), prior depression (AOR=2.8, 95% CI:1.3-6.0), domestic violence (AOR=3.5, 95% CI:1.5-8.2), and low/moderate social support (AOR=2.9, 95% CI:1.4-6.0). MSPSS subscale analysis highlighted lower family support among urban women.

Conclusion: APD is a pressing public health issue. Interventions should be context-specific: urban areas require targeted mental health outreach and strengthened family/community support, whereas rural programs should focus on stigma reduction, social support enhancement, and improved access to screening. Integrating maternal mental health services into routine antenatal care is essential to improve maternal and neonatal outcomes.

Keywords: Antepartum, Antenatal, Prenatal, Depression, Depressive Disorder, Community, Rural, Urban, India

ARTICLE INFO

Financial Support: This research project (No. 02/72/2022-23/ICSSR/RP/MJ) was gratefully received from the Indian Council of Social Science Research (ICSSR), Ministry of Education, Government of India.

Conflict of Interest: The authors have declared that no conflict of interest exists.

Received: 15-11-2025, **Accepted**: 24-01-2026, **Published**: 01-03-2026

***Correspondence:** Dr. Manas Ranjan Behera (Email: b.manas03@gmail.com)

How to cite this article: Behera D, Behera MR, Sichalwe MM, Behera S. Rural-Urban Antepartum Depression in Khordha District, Odisha, India: Prevalence, Risk Factors, and Social Support. Natl J Community Med 2026;17(3):187-195. DOI: 10.55489/njcm.170320266211

INTRODUCTION

Pregnancy involves substantial physiological and psychological adjustments as women prepare for childbirth and motherhood.[1] Although often considered a positive life transition, it can also bring uncertainty, stress, and emotional vulnerability.[2] Adequate support from family, community, and healthcare providers is therefore essential for maternal well-being.[3,4] Antepartum depression (APD), defined as depressive symptoms occurring during pregnancy, has emerged as a major public health concern because it affects maternal health, fetal development, and family functioning.[5] The World Health Organization (WHO) estimates that about 10% of pregnant women worldwide experience mental health disorders[6], primarily depression, and these conditions are associated with increased risks of preterm birth, low birth weight, postpartum depression, and impaired maternal-infant bonding.[6,7]

In low- and middle-income countries, APD prevalence ranges between 15.6-47%[3,8,9], influenced by socioeconomic and obstetric factors.[3,7] In India, the reported prevalence varies widely due to differences in study settings and screening tools[7], with APD ranging from 3.8% to 65% and antenatal anxiety from 13% to 55% [10]. Common risk factors include financial stress, marital conflict, domestic violence, unplanned pregnancy, prior pregnancy loss, and partner alcohol use[10,11], whereas strong social support and positive pregnancy attitudes can offer protection[3,7]. APD also heightens the risk of suicidal ideation and contributes to poor maternal self-care, relationship difficulties, breastfeeding challenges, and adverse child health outcomes.[3,7,11]

In Odisha, evidence is limited, with few studies on APD or rural-urban differences; one study reported a 28% prevalence, with higher symptoms in early and late pregnancy.[12] Stigma, limited mental health resources, and poor help-seeking further compound the burden in resource-constrained settings.[12,13] Importantly, no study in Odisha has systematically compared rural and urban variations in APD prevalence, associated risk factors, and levels of social support. To address this gap, the present study aimed to: a) Compare the prevalence of antepartum depression between urban and rural pregnant mothers of Khordha District, Odisha, India. b) Identify socio-demographic, psychosocial, and obstetric risk factors associated with APD. c) Compare Multidimensional Scale of Perceived Social Support (MSPSS) subscale scores between rural and urban pregnant women.

METHODOLOGY

Design and study area: A community-based cross-sectional study was conducted between September and December 2024, involving 366 pregnant women selected through a multistage sampling approach in Khordha District, Odisha State. Odisha, a mineral-rich state in eastern India, continues to face higher poverty levels than the national average.[14] Khordha, located in the east-central region of the state, has a total population of 2,251,673, with a sex ratio of 929 females per 1,000 males as reported in the 2011 Census.[15] The district exhibits notable maternal health indicators, with 37.3% of deliveries conducted via caesarean section, 91% of women receiving antenatal care, and 95.4% accessing postnatal services[16], figures that exceed the national averages reported in the National Family Health Survey (NFHS-5). Administratively, Khordha comprises 10 rural blocks and two urban areas.

Study population: Females undergoing pregnancy and residing in urban and rural areas were considered the study population.

Inclusion criteria: Pregnant women aged 18years and above were included in the study, provided they understood and spoke the Odia language and gave their consent to participate.

Exclusion criteria: Participants were excluded if they were under 18 years of age, not currently pregnant, or unwilling to provide informed consent. In addition, women who could not speak or comprehend the Odia language were not included in the study.

Sample size estimation: Sample size was estimated using the two-proportion formula with a 95% confidence level and 80% power.

The calculation applied the formula:

$$N = \left(Z_{\alpha/2} + Z_{\beta}\right)^2 \times \frac{P_1(1-P_1)+P_2(1-P_2)}{(P_1-P_2)^2}$$

The past stated prevalence of antepartum depression among rural (23.9%)[17] and urban (12.68%)[18]. The required sample size was calculated to be 183 participants per group. After adjusting for a 5% anticipated non-response rate, the final sample size was 193 participants per group, giving a total sample size of 386 participants.

Sampling technique: A multistage sampling strategy was employed to systematically select antenatal women across Khordha District. Initially, Khordha was purposively chosen from Odisha's 30 districts for its accessibility and balance of rural and urban populations. In the next stage, two rural blocks were randomly selected, and Bhubaneswar city was purposively chosen to represent the urban setting. From these areas, four Rural Primary Health Centres (RPHCs) and four Urban Primary Health Centres (UPHCs) were randomly chosen. Subsequently, two Sub-Centres from each RPHC and two wards from each UPHC were selected through simple random sampling. Finally, all pregnant women registered in these facilities were identified and invited to participate. In total, out of 386 individuals approached, 366 eligible participants were enrolled, yielding a response rate of 94.8%. The sampling framework is illustrated in Figure 1.

Sampling and Participants: The study included 363 pregnant women from Khordha District, Odisha. The final sample comprised 136 rural and 227 urban participants. This differs from the initial target of 193 per group due to rural recruitment challenges (women relocating for delivery) and higher urban enrolment. This discrepancy between the estimated and achieved samples may have implications for representativeness and should be considered when interpreting the findings.

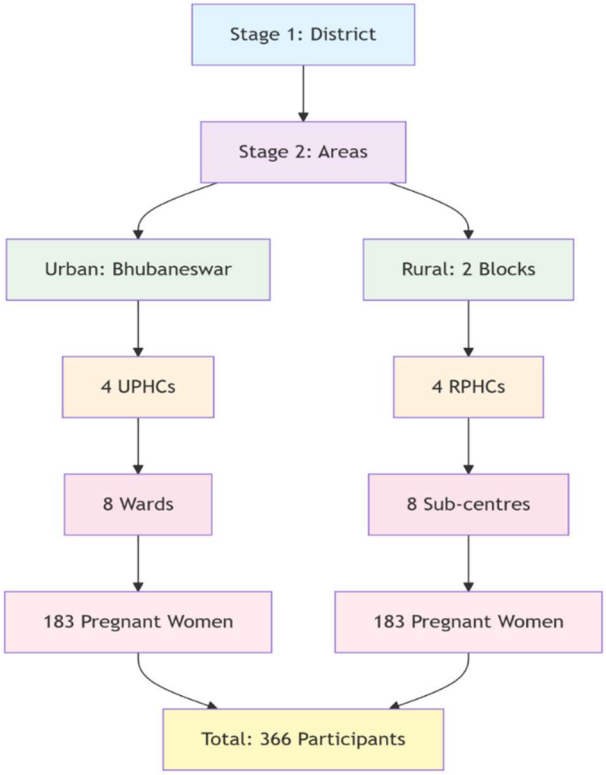

Figure 1: Multi-stage sampling design for participant selection in urban and rural areas

Tool for data collection: Data collection employed a structured, interviewer-administered, and pretested questionnaire designed to capture comprehensive information from participants. Three complementary instruments were integrated into the tool to ensure depth and accuracy of data. The first component gathered socio-demographic and background information, including participants' age, educational attainment, occupation, monthly income, religion, and history of abortion. Self-reported experiences of depression and domestic violence were also captured. Depression history was recorded using a binary response (Yes/No), while exposure to domestic violence was determined based on reports of physical or verbal abuse, offering insight into participants' psychosocial contexts. The second component assessed perinatal depression using the Patient Health Questionnaire-9 (PHQ-9), a standardised nine-item instrument widely validated for identifying depressive symptoms. Scores ranged from 0 to 27, with higher values signifying greater symptom severity. The third component examined perceived social support through the MSPSS, which evaluates the level of support received from family, friends, and significant others.[19,20]

Measurement of the instrument: Female questionnaire: In this part, the questions included their socio-demographic characteristics such as age, occupations, qualifications, religion, monthly income, and number of family members.

Social Support Assessment: Perceived social support was measured using the MSPSS, a widely validated 12-item instrument assessing support from family, friends, and significant others.[19,20] Participants rated each statement on a 7-point Likert scale ranging from 1 ("very strongly disagree") to 7 ("very strongly agree"). Sample items include "My friends try to help me" and "I can talk about my problems with my family." Mean scores were computed to determine overall support levels: 1.0-2.9 indicating low, 3.0-5.0 moderate, and 5.1-7.0 high perceived support. The MSPSS is recognized for its strong reliability and cross-cultural validity, particularly in studies involving perinatal populations. Its inclusion in this study enabled a nuanced understanding of the emotional and social resources available to participants, which are critical to maternal mental health outcomes.

Multi-dimensional Scale of Perceived Social Support (MSPSS) items in English, adapted into question format Item

Table 1: Adapted Multi-Dimensional Scale of Perceived Social Support (MSPSS) Items in Question Format

1. Do you have someone special you can rely on when you face difficulties?
2. Is there a particular person with whom you can share both happy and sad moments?
3. Does your family make an effort to support and assist you when needed?
4. Do you receive the emotional care and encouragement you require from your family?
5. Is there someone in your life who provides you with genuine comfort and reassurance?
6. Do your friends make an effort to be there for you when you need help?
7. Can you depend on your friends for support during challenging times?
8. Are you able to discuss your personal problems openly with your family?
9. Do you have friends you can confide in about your happiness and worries?
10. Is there a significant person in your life who shows concern for your feelings and well-being?
11. Does your family assist you in making important life decisions?
12. Are you comfortable sharing your problems and seeking advice from your friends?

Scoring of MSPSS Subscales: The *Family Support Subscale* was derived by averaging responses from items 3, 4, 8, and 11. The *Friend Support Subscale* was computed using the mean of items 6, 7, 9, and 12. *Significant Other Subscale* was obtained by averaging scores from items 1, 2, 5, and 10.

Perinatal depression screening: PHQ-9 tool was used to screen the depression which consists of 9 questions, ranging from 0 to 27. PHQ-9 scores were categorized as follows: 0-4 denoted no or minimal depression, 5-9 represented mild depression, 10-14 indicated moderate depression, 15-19 reflected moderately severe depression, and 20-27 corresponded to severe depression.

Data collection procedure, data quality control and data processing:

Data collection was conducted during Urban Health and Nutrition Days (UHND) in urban areas, Village Health and Nutrition Days (VHND) in rural areas, and designated immunization days, ensuring accessibility and convenience for participants.

The questionnaire was first developed in English and then translated into Odia, the local language, to enhance participants' comprehension. To ensure linguistic and conceptual equivalence, an independent expert performed a back-translation into English for comparison and consistency. Rigorous quality control measures were implemented at every stage of data collection. Before initiating fieldwork, the research team refined and contextualised the structured questionnaire, followed by a two-day comprehensive training session for data collectors to standardise procedures and uphold data reliability. This training covered the study objectives, questionnaire content, methodology, and pretesting procedures to enhance accuracy and reliability. Before the data collection, a pre-test was conducted in a non-research area among 7% (25 participants) of the sample size to check the participants' response, for the language clarity. The necessary corrections and modifications were made in the questionnaire at the end of the pretest. Throughout data collection, the investigators and supervisors maintained strict oversight, routinely reviewing questionnaires for accuracy, completeness, and internal consistency. Continuous follow-ups were conducted to address any discrepancies promptly. After data collection, the research team performed a thorough verification process to confirm data accuracy and resolve inconsistencies. The finalised dataset was then systematically entered into SPSS version 25 for analysis, ensuring high standards of data reliability and analytical precision.

Data analysis: Data were cleaned and checked for completeness in Excel before analysis. Analyses were conducted using SPSS version 25. Continuous variables are presented as means ± standard deviations, and categorical variables as frequencies and percentages. Urban-rural comparisons for Table 1 variables and MSPSS subscales were performed using independent-samples t-tests for continuous variables and Chi-square tests for categorical variables. Corresponding p-values were calculated to assess the statistical significance of differences between urban and rural participants. Associations between antepartum depression and potential predictors were assessed using odds ratios (OR) with 95% confidence intervals (CI). Variables associated with antepartum depression at $p < 0.05$ in bivariate analysis were entered into a multivariable logistic regression model. Crude Odd Ratio (COR) from the univariate logistic regression and adjusted odds ratios (AOR) with 95% confidence intervals from the multivariable model were both reported. Variables with $p < 0.05$ in the multivariable model were considered independent predictors of antepartum depression.

Ethical statement: Ethical clearance for this study was obtained from the Institutional Ethics Committee of KIIT Deemed to be University, Bhubaneswar, Odisha (Ref No: KIIT/KIMS/IEC/1438/2023). Before participation, written informed consent was secured from all respondents after a thorough explanation of the study's objectives and significance. Data collection was carried out through face-to-face interviews in a private setting to ensure comfort and trust. Participant confidentiality was strictly maintained throughout the research process, with all identifying information kept anonymous and secure.

RESULTS

Out of the total 366 participants approached, responses from 136 pregnant women in rural areas were considered valid and included in the final analysis. Although the calculated sample size for the rural group was 183, many pregnant women had relocated to their parental homes for delivery during the data collection period, which limited the ability to reach the targeted number. In contrast, the urban UPHCs had a higher-than-expected attendance of pregnant women, allowing for a larger enrolment. Consequently, the urban sample was increased to 227. This resulted in a final analyzed sample of 363 participants (rural = 136; urban = 227).

The socio-demographic profile is highlighted in Table 1. The study examined mothers aged 18 to 46 years, with the majority between 18 and 30. A slightly higher proportion of younger individuals (18-24 years) were from urban areas. Educational attainment was marginally higher among urban mothers, while a greater percentage of rural mothers had only basic or primary education, i.e., 62.5% from rural and 58.6% from urban. Whereas, unemployment was significantly higher in rural areas (96.3%) compared to urban areas (74.9%). Most participants fell within the low-to-moderate income range (equivalent to USD 11-223, using an exchange rate of 1 USD = Rs.90), with a larger proportion of rural participants earning in the lowest income bracket (34.6%) compared to urban participants (28.2%), with nearly half belonging to the general category. Hinduism was the pre-

dominant faith (86.0%), with a higher proportion of Hindus in rural regions (94.1%) than urban regions (85.9%). Mental health indicators revealed that past depression was more prevalent in urban areas (31.7%) than in rural areas (21.3%). However, the prevalence of a family history of depression was similar in both groups (13.5%). Past abortions were slightly more common among urban women (16.7%) than rural women (14.7%). Incidents of domestic violence were marginally higher in rural areas (13.2%) compared to urban areas (11.9%). Overall, perceived social support was high (62.5%), with rural participants reporting greater support (66.2%) than their urban counterparts (60.4%).

Among rural participants, 8 women were identified as having antepartum depression, corresponding to a prevalence of 5.9%, while 128 women (94.1%) did not have depression. In contrast, among urban participants, 46 women were found to have depression, yielding a substantially higher prevalence of 20.3%, whereas 181 women (79.7%) were not depressed.

Overall, across both settings, 54 out of 363 pregnant women were diagnosed with antepartum depression, resulting in an overall prevalence of 14.9%. The remaining 309 women (85.1%) did not exhibit depression.

Table 2 summarises the determinants of antepartum depression among pregnant women in Khordha district (N = 363). The analysis reveals that women residing in urban areas were significantly more prone to antepartum depression, being 4.54 times more likely to experience it compared to those in rural settings (AOR = 4.54, 95% CI: 1.80-11.44, p = 0.001). Economic status also played a notable role. While the bivariate association did not indicate a significant effect of family income on the depression status (COR = 1.71, 95% CI: 0.92-3.17, p = 0.08), the adjusted statistical values showed that the participants from households earning USD 165 or more per month had a higher likelihood of depression (AOR = 2.19, 95% CI: 1.02-4.75, p = 0.04) than those earning less. In contrast, pregnancy intention, which was found to have a significant effect on depression status in the bivariate test (COR = 2.79, 95% CI: 1.30-5.96, p = 0.008), it did not remain significant in the adjusted model (COR = 1.87, 95% CI: 0.70-4.97, p = 0.21).

Table 1: Socio-demographic and obstetric factors of the Antepartum mother (N=363)

Variables	Total (N=363) (%)	Urban (N=227) (%)	Rural (N=136) (%)	*p* value
Age				
18-24 years	136 (37.5)	90 (39.6)	46 (33.8)	0.249
25-30 years	148 (40.8)	85 (37.4)	63 (46.3)	
31-46 Years	79 (21.8)	52 (22.9)	27 (19.9)	
Education of Mother				
Basic or primary education	218 (60.1)	133 (58.6)	85 (62.5)	0.462
Higher education	145 (39.9)	94 (41.4)	51 (37.5)	
Employment status				
Unemployed	301 (82.9)	170 (74.9)	131 (96.3)	<0.001
Employed	62 (17.1)	57 (25.1)	5 (3.7)	
Caste				
General	180 (49.6)	111 (48.9)	69 (50.7)	0.007
Other backward caste	88 (24.2)	52 (22.9)	36 (26.5)	
Scheduled caste/Tribes	95 (26.2)	64 (28.2)	31 (22.8)	
Religion				
Hindu	312 (86.0)	195 (85.9)	128 (94.1)	0.973
Muslim/Christian	51 (14.0)	32 (14.1)	8 (5.9)	
Income				
USD 11-111	111 (30.6)	64 (28.2)	47 (34.6)	0.248
USD 123-223	185 (51.0)	116 (51.1)	69 (50.7)	
≥ USD 223	67 (18.5)	47 (20.7)	20 (14.7)	
Abortion in past				
No	305 (84.0)	189 (83.3)	116 (85.3)	0.609
Yes	58 (16.0)	38 (16.7)	20 (14.7)	
Past history of depression				
No	262 (72.2)	155 (68.3)	107 (78.7)	0.273
Yes	101 (27.8)	72 (31.7)	29 (21.3)	
Family history of depression				
No	314 (86.5)	196 (86.3)	118 (86.8)	0.552
Yes	49 (13.5)	31 (13.7)	18 (13.2)	
Domestic Violence				
No	322 (88.7)	200 (88.1)	122 (89.7)	0.641
Yes	41 (11.3)	27 (11.9)	14 (13.2)	
Score of MSPSS				
Low	16 (4.4)	9 (4.0)	7 (5.1)	0.369
Moderate	120 (33.1)	81 (35.7)	39 (28.7)	
High	227 (62.5)	137 (60.4)	90 (66.2)	

Chi-square test for categorical variables and independent t test for continuous variable; *p value <0.05 considered significant. 1USD= 90 Indian Rupees (as on Dec 2025)

Table 2: Factors associated with antepartum depression among participants in Khordha district

Variables	Having Depression		COR (95% of CI)	P-value	AOR (95% of CI)	P-value
	Present (n=54)(%)	Absent (n=309) (%)				
Place of residency						
Rural	8 (5.9)	128 (94.1)	1	1	1	0.001*
Urban	46 (20.3)	181 (79.7)	4.06 (1.86-8.90)	<0.001*	4.54(1.80-11.44)	
Age of mother						
<25 years	23 (16.9)	113 (83.1)	1	1	1	0.23
25 years and above	31 (13.7)	196 (86.3)	0.77 (0.43-1.39)	0.40	0.62(0.28-1.35)	
Education of mother						
Up to 10th education	33 (15.1)	185 (84.9)	1	1	1	0.18
>10th education	21 (14.5)	124 (85.5)	1.05 (0.58-1.91)	0.86	1.69(0.78-3.66)	
Mother's Employment						
Unemployed	43 (14.3)	258 (85.7)	1	1	1	0.16
Employed	11 (17.7)	51 (82.3)	0.77 (0.37-1.59)	0.49	0.48(0.17-1.33)	
Caste						
General	25 (13.9)	155 (86.1)	1	1	1	0.23
Others	29 (15.8)	154 (84.2)	1.17 (0.65-2.08)	0.60	1.58(0.74-3.35)	
Religion						
Hindu	42 (13.5)	270 (86.5)	1	1	1	0.25
Others	12 (23.5)	39 (76.5)	1.98 (0.96-4.08)	0.06	1.77(0.67-4.64)	
Family income						
USD <165	17 (11.1)	136 (88.9)	1	1	1	0.04*
USD ≥165	37 (17.6)	173 (82.4)	1.71 (0.92-3.17)	0.08	2.19(1.02-4.75)	
Abortion in past						
No	40 (13.1)	265 (86.9)	1	1	1	0.54
Yes	14 (24.1)	44 (75.9)	2.11 (0.86-4.19)	0.13	1.34(0.52-3.41)	
Having male child						
Have no male child	22 (18.0)	100 (82.0)	1	1	1	
Have male child	11 (14.3)	66 (85.7)	0.76 (0.34-1.66)	0.49	1.04 (0.36-2.95)	0.94
Not delivered yet	21 (12.8)	143 (87.2)	0.67 (0.35-1.28)	0.22	0.78(0.31-1.93)	0.59
Pregnancy intention						
Yes	34 (12.5)	237 (87.5)	1	1	1	
Yes, but not now	8 (16.0)	42 (84.0)	1.33 (0.58-3.07)	0.50	1.10(0.39-3.06)	0.86
No	12 (28.6)	30 (71.4)	2.79 (1.30-5.96)	0.008*	1.87(0.70-4.97)	0.21
Past history of depression						
No	24 (9.2)	238 (90.8)	1	1	1	<0.001*
Yes	30 (29.7)	71 (70.3)	3.71 (1.96-7.03)	<0.001*	4.14(1.86-9.17)	
Family history of depression						
No	40 (12.7)	274 (87.3)	1	1	1	0.18
Yes	14 (28.6)	35 (71.4)	1.55 (0.72-3.35)	0.26	1.86 (0.75-4.58)	
Domestic violence						
No	35 (10.9)	287 (89.1)	1	1	1	<0.001*
Yes	19 (46.3)	22 (53.7)	7.08 (3.49-14.36)	<0.001*	6.41(2.75-14.91)	
Social support						
Low/ Moderate	31 (22.8)	105 (77.2)	1	1	1	0.002*
High	23 (10.1)	204 (89.9)	0.38 (0.21-0.69)	0.001*	0.31(0.14-0.64)	

*Represents the significance of <0.05; COR-Crude Odd Ratio

Table 3: Mean scores for the Multidimensional Scale of Perceived Social Support

Sub-Scale	Overall				Rural	Urban	*p* value
	Low	Moderate	High	Mean±SD	Mean±SD	Mean±SD	
Family Subscale	31 (8.5)	119 (32.8)	213 (58.7)	5.21±1.54	5.59±1.43	4.98±1.57	<0.001
Friends Subscale	145 (39.9)	96 (26.4)	122 (33.6)	3.89±1.98	3.91±2.02	3.88±1.96	0.89
Significant other Subscale	12 (3.3)	100 (27.5)	251 (69.1)	5.66±1.36	5.68±1.44	5.65±1.31	0.87

A prior history of depression showed a strong correlation, with affected women facing over a fourfold increased risk (AOR = 4.14, 95% CI: 1.86-9.17, p < 0.001). Furthermore, domestic violence emerged as a major predictor, as women exposed to it were over six times more likely to develop antepartum depression (AOR = 6.41, 95% CI: 2.75-14.91, p < 0.001). Conversely, social support demonstrated a significant protective effect, women with strong support networks had markedly reduced odds of depression (AOR = 0.31, 95% CI: 0.14-0.64, p = 0.002).

Table 3 illustrates participants' perceptions of social support across three dimensions, Family, Friends, and Significant Others, while comparing across rural and urban pregnant women. The Family Subscale indicates that a majority (58.7%) experienced strong

familial support, while 32.8% reported moderate and 8.5% low support. The overall mean score for the family sub-scale was 5.21 (SD = 1.54), which underscores the central role of family as a key support system. Moreover, the perceived social support from the family was found to be significantly different ($p<0.001$) between rural and urban study participants. While the mean score for the family sub-scale for rural women was found to be 5.59 (SD = 1.43), it was only 4.98 (SD = 1.57) for urban study participants.

The Friends Subscale of perceived social support displays a more varied pattern, with 39.9% perceiving low support, 26.4% moderate, and 33.6% high support. The mean score of 3.89 (SD = 1.98) suggests comparatively weaker reliance on friends for emotional or practical assistance. Meanwhile, the Significant Other Subscale records the highest perceived support, with 69.1% of participants reporting strong support, 27.5% moderate, and just 3.3% low. The mean score of 5.66 (SD = 1.36) reinforces the notion that significant others serve as the most dependable and influential source of social support among the three domains. There was no statistically significant difference found between the perceived social support from friends and significant others between rural and urban pregnant women in the study.

Discussion

The increasing recognition of perinatal depression as a global concern has led to greater awareness of antepartum depression in both developed and developing nations. This condition can significantly impact both maternal and infant health, affecting well-being, pregnancy outcomes, and early childhood development. Our study aimed to assess its prevalence and associated risk factors in both rural and urban settings, providing a comparative analysis. Pregnancy is a crucial phase in a woman's life, marked by hormonal shifts that may increase vulnerability to mental health issues such as depression, anxiety, and self-harm. Ensuring strong social support for expectant mothers can play a vital role in reducing these risks, preventing complications, and promoting healthier birth outcomes.

This study found that 14.9% of pregnant women exhibited symptoms of depression, with a significantly higher prevalence in urban areas (20.3%) compared to rural settings (5.9%), highlighting antenatal depression as an important public health concern. The higher burden observed in urban populations may reflect greater psychosocial stress, social isolation, and weaker family support systems. In contrast, stronger familial and community networks in rural areas may offer protective effects against psychological distress.[18,21] These findings are consistent with previous studies from India, South Asia, and Ethiopia reporting comparable prevalence levels,[7,11,21,22] underscoring the role of social and environmental determinants in maternal mental health. The urban prevalence observed in this study is similar to reports from Thailand (18.9%)[23], Kenya (26.9%)[24], and North India (25.3%)[11], while the lower rural prevalence contrasts with findings from hospital-based studies in North India (17.7%).[11] Importantly, the community-based design of the present study likely provides a more accurate reflection of population-level antenatal depression than facility-based studies, which may overestimate prevalence due to selection bias.

This study further identified key socio-demographic and psychosocial factors associated with antepartum depression. Factors such as place of residence, family income, history of depression, domestic violence, and low social support were associated with antepartum depression, consistent with findings from other studies.[11,21,25] However, other studies identified additional significant factors, including young maternal age, lower education of the mother, unintended pregnancy, General caste, Hindu religion, and abortion history.[26] In contrast, our study did not find these factors to be significantly associated with antepartum depression. Moreover, social support was found to play a crucial role in maternal emotional well-being. Our study revealed that women who received strong support from family and friends exhibited lower levels of antenatal depression. This finding is consistent with other research highlighting the importance of social networks in reducing stress, improving mental health, and fostering better coping mechanisms for pregnant women.[4,21] The presence of strong social support networks has been linked to reduced stress levels, improved mental health outcomes, and better coping mechanisms for expectant mothers.[4,25] Given these findings, it is essential to strengthen support systems and promote mental health awareness in both rural and urban settings to improve maternal and neonatal outcomes.

Analysis of the MSPSS subscales revealed clear differences in social support between rural and urban participants. Rural women reported significantly higher levels of family support than their urban counterparts, whereas the Friends and Significant Other subscales showed no meaningful rural-urban differences.[23, 25] This pattern suggests that stronger family networks in rural areas may provide an important protective effect against psychological distress during pregnancy.[11,23,27] Similar findings were reported in studies from India and Ethiopia, where women with higher perceived family support had lower odds of antenatal depression, particularly in rural settings.[4,27] Conversely, the lower family support observed among urban women likely contributes to the higher prevalence of antepartum depression in urban settings, reinforcing the central role of family-based support systems in shaping maternal mental health outcomes.[11,23] The presence of strong social support networks has been linked to reduced stress levels, improved mental health outcomes, and better coping mechanisms for expectant mothers.

Given these findings, it is essential to strengthen support systems and promote mental health awareness in rural and urban settings to ensure better maternal and neonatal outcomes.

Strengths and Limitations

This community-based study provides a robust estimate of antepartum depression prevalence, capturing cases that may otherwise go undetected. Rural-urban comparisons highlight geographical differences, and identified risk factors can guide targeted interventions. The use of validated tools (PHQ-9 and MSPSS), multistage sampling, and UHND/VHND data collection enhances reliability, representativeness, and participation. However, several limitations exist. Recruitment through selective health events may have introduced selection bias. Rural prevalence may be underestimated due to cultural stigma, limited family support, and participant relocation. The district was selected by convenience, potentially limiting generalizability. Additionally, unequal selection probabilities within clusters, without weighting adjustments, could bias prevalence estimates. Despite these limitations, the study offers valuable insights into strengthening mental health awareness and support systems in under-resourced communities.

Conclusion

Antepartum depression is a pressing public health concern, with higher prevalence in urban areas compared to rural settings. Urban women also reported lower family support, contributing to elevated risk, while stronger family networks in rural areas provided protective effects. Key risk factors include poor social support, low income, prior depression, and domestic violence. Policy and practice should focus on context-specific strategies: urban areas need targeted mental health outreach and strengthened family and community support, while rural programs should address stigma, promote social support, and ensure access to screening and mental health resources. Integrating maternal mental health services into routine antenatal care is essential to improve outcomes for infants and mothers.

Acknowledgement: The authors wish to acknowledge School of Public Health, Kalinga Institute of Industrial Technology (KIIT) Deemed to be University, which provided administrative and technical support and allowed collaboration with field research site activities. They also wish to thank all field coordinators, investigators and participants who took part in the data collection process.

Individual Authors' Contributions: MRB conceptualized the study and lead the project; DB, MRB wrote the first draft. DB & MMS carried out analysis and made the interpretations. MRB, DB, MMS & SB conducted the technical review of the methods and interpretation of the findings and provided content-expertise. All authors contributed to scientific writing and guaranteed the integrity of the work.

Availability of Data: Data will be available upon request to the corresponding author.

Declaration of Non-use of Generative AI Tools: This article was prepared without the use of generative AI tools for content creation, analysis, or data generation. All findings and interpretations are based solely on the authors' independent work and expertise.

References

1. Davis EP, Narayan AJ. Pregnancy as a period of risk, adaptation, and resilience for mothers and infants. Dev Psychopathol. 2020;32(5):1625-1639. DOI: https://doi.org/10.1017/S0954579420001121 PMid:33427164 PMCid:PMC7863987
2. Prabhu S, Guruvare S, George LS, Nayak BS, Mayya S. Prevalence and Associated Risk Factors of Antenatal Depression among Pregnant Women Attending Tertiary Care Hospitals in South India. Depress Res Treat. 2022;2022:9127358. DOI: https://doi.org/10.1155/2022/9127358 PMid:36438017
3. Roddy Mitchell A, Gordon H, Lindquist A, et al. Prevalence of Perinatal Depression in Low- and Middle-Income Countries: A Systematic Review and Meta-analysis. JAMA Psychiatry. 2023;80(5):425-431. DOI: https://doi.org/10.1001/jamapsychiatry.2023.0069 PMid:36884232 PMCid:PMC9996459
4. Pasricha M, Kochhar S, Shah A, Bhatia A. Sense of Coherence, Social Support, Maternal-Fetal Attachment, and Antenatal Mental Health: A Survey of Expecting Mothers in Urban India. Front Glob Womens Health. 2021 Sep 7;2:714182. DOI: https://doi.org/10.3389/fgwh.2021.714182 PMid:34816240
5. Dadi AF, Miller ER, Bisetegn TA, Mwanri L. Global burden of antenatal depression and its association with adverse birth outcomes: an umbrella review. BMC Public Health. 2020;20(1):173. DOI: https://doi.org/10.1186/s12889-020-8293-9 PMid:32019560 PMCid:PMC7001252
6. World Health Organization (WHO). Perinatal mental health. Mental Health, Brain Health and Substance Use; 2026 [cited 2026 Jan 7]. Available from: https://www.who.int/teams/mental-health-and-substance-use/promotion-prevention/maternal-mental-health
7. Mahendran R, Puthussery S, Amalan M. Prevalence of antenatal depression in South Asia: a systematic review and meta-analysis. J Epidemiol Community Health. 2019;73(8):768-777. DOI: https://doi.org/10.1136/jech-2018-211819
8. Zegeye A, Alebel A, Gebrie A, et al. Prevalence and determinants of antenatal depression among pregnant women in Ethiopia: a systematic review and meta-analysis. BMC Pregnancy and Childbirth. 2018;18(1):462. DOI: https://doi.org/10.1186/s12884-018-2101-x PMid:30486804 PMCid:PMC6264030
9. Okagbue HI, Adamu PI, Bishop SA, Oguntunde PE, Opanuga AA, Akhmetshin EM. Systematic Review of Prevalence of Antepartum Depression during the Trimesters of Pregnancy. Open Access Maced J Med Sci. 2019;7(9):1555-1560. DOI: https://doi.org/10.3889/oamjms.2019.270 PMid:31198472 PMCid:PMC6542400
10. Sahoo S, Gill G, Sikka P, Nehra R. Antenatal depression and anxiety in Indian women: A systematic review. Ind Psychiatry J. 2023;32(2):222-233. DOI: https://doi.org/10.4103/ipj.ipj_156_22 PMid:38161466 PMCid:PMC10756614

11. Nawab T, Akram A, Rafat D, Khan T. Antepartum Depression and Its Clinico-Social Correlates: A Cross Sectional Study in a Tertiary Hospital of North India. J Obstet Gynaecol India. 2023;73(Suppl 2):247-254. DOI: https://doi.org/10.1007/s13224-023-01878-1 PMid:38143973 PMCid:PMC10746677

12. Roy U, Swain D. A prospective cohort study to assess the prevalence and risk factors of antepartum depression and its effect on maternal and fetal outcome. Asian J Psychiatr. 2024;91:103873. DOI: https://doi.org/10.1016/j.ajp.2023.103873 PMid:38154353

13. Hong SA, Buntup D. Maternal Depression during Pregnancy and Postpartum Period among the Association of Southeast Asian Nations (ASEAN) Countries: A Scoping Review. Int J Environ Res Public Health. 2023;20(6):5023. DOI: https://doi.org/10.3390/ijerph20065023 PMid:36981932 PMCid:PMC10049420

14. Government of Odisha. Khordha District – Official Website [Internet]. Odisha: Government of Odisha. Available from: https://khordha.odisha.gov.in/ [Accessed Sep 29, 2025]

15. Census India 2011. Khordha District Population, Caste, Religion Data (Odisha) - Census 2011. Available from: https://www.censusindia.co.in/district/khordha-district-odisha-386 [Accessed Jan 19 2026]

16. National Family Health Survey-5 2019-21. District Fact Sheet, Khordha, Odisha. [Accessed Jan 22 2026] Available from: https://www.nfhsiips.in/nfhsuser/publication.php17.

17. Raghavan V, Khan HA, Seshu U, Rai SP, et al. Prevalence and risk factors of perinatal depression among women in rural Bihar: A community-based cross-sectional study. Asian J Psychiatr. 2021;56:102552. DOI: https://doi.org/10.1016/j.ajp.2021.102552 PMid:33454561 PMCid:PMC7896100

18. Badiya PK, Siddabattuni S, Dey D, et al. Identification of clinical and psychosocial characteristics associated with perinatal depression in the south Indian population. Gen Hosp Psychiatry. 2020;66:161-170. DOI: https://doi.org/10.1016/j.genhosppsych.2020.08.002 PMid:32871347

19. Tambag H, Turan Z, Tolun S, Can R. Perceived social support and depression levels of women in the postpartum period in Hatay, Turkey. Niger J Clin Pract. 2018;21(11):1525-1530. DOI: https://doi.org/10.4103/njcp.njcp_285_17 PMid:30417855

20. Greenspace Mental Health Ltd. Multidimensional Scale of Perceived Social Support (MSPSS) [Internet]. Pacific Palisades (CA): Greenspace Mental Health Ltd; 2020 Nov 16. Available from: https://greenspacehealth.com/en-us/perceived-social-support-mspss/ [Accessed on Jan 10, 2026]

21. Jyothi Kantipudi S, Kannan GK, Viswanathan S, Ranganathan S, Menon J, Ramanathan S. Antenatal Depression and Generalized Anxiety Disorder in a Tertiary Hospital in South India. Indian J Psychol Med. 2020 Aug 11;42(6):513-518. DOI: https://doi.org/10.1177/0253717620928440 PMid:33354075 PMCid:PMC7735237

22. Mersha AG, Abebe SA, Sori LM, Abegaz TM. Prevalence and Associated Factors of Perinatal Depression in Ethiopia: A Systematic Review and Meta-Analysis. Depress Res Treat. 2018;2018:1813834. DOI: https://doi.org/10.1155/2018/1813834 PMid:30018821 PMCid:PMC6029503

23. Tuksanawes P, Kaewkiattikun K, Kerdcharoen N. Prevalence and Associated Factors of Antenatal Depressive Symptoms in Pregnant Women Living in an Urban Area of Thailand. Int J Womens Health. 2020;12:849-858. DOI: https://doi.org/10.2147/IJWH.S278872 PMid:33116934 PMCid:PMC7573318

24. Mulupi S, Abubakar A, Nyongesa MK, Angwenyi V, et al. Prevalence and correlates of depressive and anxiety symptoms among pregnant women from an urban informal settlement in Nairobi, Kenya: a community-based cross-sectional study. BMC Pregnancy Childbirth. 2025;25(1):213. DOI: https://doi.org/10.1186/s12884-025-07339-z PMid:40011816 PMCid:PMC11863928

25. Megha S, Dona T, Jaya R, Navya CJ, Shilpa R , et al. Depression in antenatal period among women attending a Rural maternity hospital in South India. RGUHS National Journal of Public Health. 2018;3(4):10-16. DOI: https://doi.org/10.26463/rnjph.3_4_3

26. Bedaso A, Adams J, Peng W, Sibbritt D. The relationship between social support and mental health problems during pregnancy: a systematic review and meta-analysis. Reprod Health. 2021 Jul 28;18(1):162. DOI: https://doi.org/10.1186/s12978-021-01209-5 PMid:34321040 PMCid:PMC8320195

27. Belay YA, Moges NA, Hiksa FF, Arado KK, Liben ML. Prevalence of Antenatal Depression and Associated Factors among Pregnant Women Attending Antenatal Care at Dubti Hospital: A Case of Pastoralist Region in Northeast Ethiopia. Depress Res Treat. 2018;2018:1659089. DOI: https://doi.org/10.1155/2018/1659089 PMid:30906594 PMCid:PMC6398073