Global Journal of Medicine & Public Health

Prevalence of Stress and Its Associated Factors among Antenatal Mothers in Rural Dakshina Kannada, Karnataka, India

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ABSTRACT

Background

Stress is a psychological and physiological response to challenges, and during pregnancy, it can have adverse effects on both mothers and their infants. Pregnancy-related stress may lead to complications such as preeclampsia, gestational diabetes, and low birth weight, impacting foetal development. Gaining insights into how common stress is among pregnant women and identifying contributing factors is essential to enhancing the well-being of both mothers and their babies.

Objectives

The study aimed to assess the prevalence of stress and identify the factors associated with antenatal stress among pregnant women attending a tertiary care hospital in rural Dakshina Kannada, Karnataka.

Materials and Methods

A cross-sectional study was conducted from June 2022 to June 2023. Data were collected from 195 pregnant women using the Perceived Stress Scale (PSS) and a structured questionnaire on demographic, obstetric, and psychosocial factors. Statistical evaluation was carried out using chi-square analysis along with logistic regression methods.

Results

Results indicated that 63.07% of the participants reported low levels of stress, while 24.10% experienced moderate stress, and 12.82% were classified as having high stress. Key factors associated with higher stress levels included lower socio-economic status, previous abortion, marital and family conflicts, and suicidal ideation.

Conclusion

A significant proportion of antenatal women experienced moderate to high levels of stress, with socio-economic challenges, marital issues, and previous abortion being major contributing factors. The outcomes highlight the importance of implementing focused strategies to reduce stress and enhance care during pregnancy.

Keywords: Antenatal stress, perceived stress scale, socio-economic status, marital conflict, pregnancy outcomes, rural health.

GJMEDPH 2025; Vol. 14, issue 3 | OPEN ACCESS

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Conflict of Interest—none | Funding—none

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INTRODUCTION

Stress represents both a mental and physical response triggered by unexpected threats or challenging circumstances, reflecting a multifaceted reaction to external pressures. It involves both psychological and physiological responses to an actual or imagined threat that demands action or resolution. This response affects cognitive, behavioural, and biological aspects, and when prolonged and persistent, it can lead to considerable adverse health consequences[1]. The World Health Organization has deemed it the "Health Epidemic of the 21st Century.[2]" According to the GOQii India Fit Report 22-23's, 24% of Indians were struggling with stress[3]. The results of a health survey conducted in India and published in The Times of India, showed that one in four Indians were under stress. The reasons ranged from health problems to financial instability to work related issues[4]. Pregnancy is a beautiful journey a mother goes through in her lifetime off course with fair share of good and bad time. Stress and emotional changes during pregnancy can have long-term adverse effects on the mother and her child, and it may interfere with mother-infant attachment and child development. The maternal stress during the antenatalperiod can have a specificeffect on cognitive and brain development outcome of the foetus[5]. Stress during the antenatal period can have several adverse effects on mothers, including an increased risk of preeclampsia, gestational diabetes, postpartum depression, low birth weight babies, and preterm delivery. Acute stress during the first trimester may be associated with the risk of developing schizophrenia in later life. Studies have also revealed that attention deficit hyperactivity disorder (ADHD) is one more common occurrence among children born to mothers who were exposed to stress during late pregnancy[6]. Prevalence of Perceived Stress among mothers during antenatal period in the developing countries is found to be 15%[4] and in India 33.3%[7].Stress during the antenatalperiod is commonly caused due to lack of family support, low socioeconomic status, unplanned or unwanted pregnancy, parental concerns, childbirth anxiety, domestic violence, partner conflicts or a catastrophic event. The sympathetic nervous system, the adrenal medulla system and the hypothalamus pituitary adrenal cortex system can all get activated after an exposure to a stressor. Secondary to this, there is a surgeof hormones such as corticotropin-releasing hormone (CRH), adrenocorticotropin-releasing hormone (ACTH), cortisol and (nor) adrenaline into the bloodstream. However, it is often seen that individuals exposed to identical stimuli may respond differently. The degree of stress response depends also on genetic factors, personality characteristics, and previous experience, support from the social environment and the way of coping with stress. This applies to pregnant women because they are also confronted with all possible stress factors[8].This study is intended to estimate the prevalence of stress and its associated factors among antenatal mothers in a Tertiary Care Hospital of Sullia, D.K district. Comprehending the extent and intensity of stress among pregnant women is vital for delivering appropriate and effective maternal healthcare services.

Materials and Methods:

A hospital based cross sectional study was conducted in a rural tertiary care teaching hospital in Karnataka between June 2022 to June 2023 among pregnant women who visited the hospital for their regular Antenatal clinic visits. A systematic random sampling was adopted to select the pregnant women after obtaining a written informed consent from them. The minimum sample size required for this study was calculated to be 195 from the formula $Z^2p(1-p)/L^2$ with p=15% (based on a pilot study) and allowable error of 5%. All pregnant women who resided in the study area for at least a year formed the sampling frame. The exclusion criteria included conditions that could influence emotional well-being or perceived antenatal stress during the interview. These criteria encompassed a history of psychiatric disorders (such as depression, schizophrenia, or anxiety), intellectual disabilities, and existing medical conditions (including diabetes, hypertension, thyroid disorders, cardiovascular diseases, and cancers). Also excluded were individuals with gynaecological issues (such as neoplasms, uterine anomalies, or infertility), current pregnancy complications (such as bleeding, pre-

eclampsia, cardiovascular conditions, gestational diabetes, multiple pregnancies, recurrent miscarriages, preterm labor, or premature rupture of membranes), and foetal complications (including abnormal foetal heart rates, foetal distress, congenital anomalies, intrauterine growth restriction, or oligohydramnios)[9].The level of stress experienced by the participants during pregnancy was assessed using the Perceived Stress Scale (PSS). PSS is a 10-item multiple-choice psychological instrument where each answer is scored from 0 to 4[12]. The total PSS score is obtained by adding the responses from all individual items on the scale. The total score ranges from 0 – 40. Score between 0 and 13 indicates low stress, scores between 14 and 26 indicates moderate stress and between 27 and 40 indicates high perceived stress. ata collection was conducted through a structured questionnaire that gathered information on demographics (such as age, education, employment, spouse's occupation, household income, smoking habits, and alcohol use); obstetric history (including pregnancy planning, number of pregnancies, gestational age, and any history of abortion); and significant life events (like bereavement, marital separation, job loss or forced career changes, experiences of trauma, suicidal ideation or attempts, and conflicts within the family or marriage). The data would be entered in Microsoft Office Excel 2007 and IBM SPSS version 21 would be used for analysis. Chi-square test and Student T test were used to find if there is a statistically significant difference between the categorical variables and continuous variables respectively. p value less than 0.05 was considered statistically significant.

Results

195 pregnant women who visited their antenatal clinics were assessed to estimate the prevalence of stress and its associated factors in a Tertiary care hospital.

Table 1: Baseline characteristics of the study population

SNO.	BASELINE CHARACTERISTICS	NO. OF PARTICIPANTS NO. (%)
	AGE DISTRIBUTION	
1	20 – 25 Years	78 (40%)
2	26 – 30 Years	76 (38.97%)
3	31 – 35 Years	35 (17.94%)
4	36 – 40 Years	6 (3.07%)
	MARITAL STATUS	
1	Married and Living Together	192 (98.46%)
2	Married but not Living Together	3 (1.53%)
	PARITY	
1	Primigravida	116 (59.48%)
2	Gravida II	66 (33.84%)
3	Gravida III	11 (5.64%)
4	Gravida IV	2 (1.02%)
	GESTATIONAL AGE	

1	< 28 Weeks	131 (67.17%)
2	28 – 32 Weeks	28 (14.35%)
3	33 – 37 Weeks	28 (14.35%)
4	38 – 40 Weeks	8 (4.10%)
	PREGNANCY INTENTION	
1	Intended	180 (92.30%)
2	Did not Intend	15 (7.69%)
	SOCIO ECONOMIC STATUS	
1	Upper	6 (3.07%)
2	Upper Middle	46 (23.58%)
3	Lower Middle	73 (37.43%)
4	Upper Lower	27 (13.84%)
5	Lower	43 (22.05%)

The study included antenatal mothers from rural Sullia, primarily aged between 20–30 years, with 78 (40%) participants aged 20–25 years and 76 (38.97%) participants aged 26–30 years. The average age was 26.81 ± 3.86 years. A majority (98.46%) were married and living together. Most participants (59.48%) were primigravida, with the remainder having 1–3 previous pregnancies. Regarding gestational age, 67.17% were under 28 weeks, while 14.35% (28 participants) were in the 28–32 weeks range. Most participants (92.30%, 180 participants) had intended pregnancies, and socio-economic status varied, with 37.43% (73 participants) falling in the lower-middle class. Risk factors included addictive habits, with 2.56% (5 participants) reporting tobacco use, and 95.38% (186 participants) having a history of previous abortion. Additionally, 22.56% (44 participants) faced marital conflict, and 31.28% (61 participants) experienced family conflict. A small number (4.61%, 9 participants) had job-related stress, while 12.82% (25 participants) had suicidal thoughts. The majority of participants (63.07%, 123 participants) scored in the low-stress range on the Perceived Stress Scale (PSS), with a mean score of 13.88 ± 8.36. Moderate stress was reported by 24.10% (47 participants), and 12.82% (25 participants) experienced high perceived stress. Age, parity, pregnancy intention, socio-economic status, addictive habits, previous abortion, and trauma from family or marital conflicts were all significantly associated with perceived stress. Participants with a history of previous abortion had a higher mean PSS score (24.44 ± 4.12) compared to those with no abortion history (13.37 ± 8.18). The highest stress levels were seen in participants with suicidal thoughts (mean score of 28.6 ± 2.21). Logistic regression revealed that socio-economic status (OR = 0.068, p = 0.012), previous abortion (OR = 8.700, p = 0.017), marital conflict (OR = 3.810, p = 0.043), family conflict (OR = 3.756, p = 0.039), and suicidal ideas (OR = 5.620, p = 0.019) were significant risk factors for stress. These findings suggest that socio-economic status, marital/family conflicts, and personal history of abortion significantly contribute to stress among antenatal mothers, highlighting the need for targeted interventions.

Table 2: Distribution of known risk factors among the study population

SNO.	RISK FACTORS	NO. OF PARTICIPANTS NO. (%)
	ADDICTIVE HABITS	
1	Chewing tobacco	5 (2.56%)
2	Nil	190 (97.43%)
	PREVIOUS ABORTION	
1	Yes	186 (95.38%)
2	No	9 (4.61%)
	DEATH OF CLOSE RELATIVE	
1	Yes	9 (4.61%)
2	No	186 (95.38%)
	PHYSICAL / PSYCHOLOGICAL TRAUMA FROM FAMILY	
1	Yes	29 (14.87%)
2	No	166 (85.12%)
	MARITAL CONFLICT	
1	Yes	44 (22.56%)
2	No	151 (77.43%)
	FAMILY CONFLICT	
1	Yes	61 (31.28%)
2	No	134 (68.71%)
	JOB RELATED STRESS	
1	Yes	9 (4.61%)
2	No	186 (95.38%)
	SUICIDAL IDEAS	
1	Yes	25 (12.82%)
2	No	170 (87.17%)

DISCUSSION

The findings of the present study revealed that most of the participants experienced low to moderate stress, with 12.82% reporting high perceived stress. The results highlight several factors that contribute to antenatal stress, including socio-economic status, previous abortion, marital and family conflict, and addictive habits, which are consistent with existing literature on maternal stress in rural settings.The high proportion of participants (63.07%) experiencing low stress in this study is similar to findings from other rural studies [10,11], where antenatal stress levels tended to be lower. However, 12.82% of participants reported high levels of perceived stress, a proportion that aligns with studies in urban areas[12], where stress due to socio-economic pressures and psychosocial factors is often more pronounced. These results reflect the broader challenges faced by pregnant women in rural regions who may have limited access to healthcare services, social support, and mental health resources. Socio-economic status emerged as a significant factor influencing antenatal stress, with women from lower socio-economic backgrounds reporting higher stress levels. This is consistent with previous studies that show how poverty, financial instability, and lack of access to adequate healthcare resources contribute to greater psychological stress during pregnancy[13]. The

findings revealed that women from lower socio-economic backgrounds reported a higher average PSS score (17.75 ± 9.75) than those in the middle and upper socio-economic status (11.72 ± 6.58), indicating that limited financial stability and access to resources may contribute to heightened stress levels. Similar findings have been reported by other studies in rural and low-income urban areas, highlighting the importance of economic stability in managing maternal health and stress during pregnancy [14,15]. Marital and family conflicts were also significantly associated with high levels of perceived stress in this study. Participants who reported marital conflict had significantly higher stress scores (24.43 ± 7.12), which is consistent with other studies showing that relationship strain during pregnancy can increase anxiety and emotional distress[16]. The emotional burden of family conflicts, including interpersonal trauma or physical/psychological trauma from family members, was another major contributor to stress in this study. This finding supports research that indicates how stressful interpersonal dynamics, including marital discord and family-related trauma, elevate stress levels and can potentially lead to adverse pregnancy outcomes[17,18] .

Table 3: Distribution of study population on the basis of PSS score

SNO.	PSS SCORE		NO. OF PARTICIPANTS NO. (%)	MEAN PSS SCORE
1	0 to 13	Low Stress	123 (63.07%)	13.88 ± 8.36
2	14 to 26	Moderate Stress	47 (24.10%)	
3	27 to 40	High Perceived Stress	25 (12.82%)	

Additionally, the history of previous abortion was found to be a strong predictor of high perceived stress, with women who had experienced abortion reporting significantly higher stress levels. This finding corroborates other studies, which indicate that previous pregnancy loss is linked to higher anxiety and stress levels in subsequent pregnancies due to emotional scars, fears of recurrence, or concerns about foetal health [19,20]. In the present study, 95.38% of participants reported a history of previous abortion, making it a prominent risk factor for antenatal stress. Although the prevalence of addictive habits like tobacco use was low (2.56%), it was associated with increased stress levels in this study, which aligns with findings from other research indicating that smoking during pregnancy can be a sign of greater emotional distress[21]. Smoking is not only a physical health risk but also a psychological coping mechanism that may reflect underlying stressors, such as anxiety or depression[22]. Therefore, addressing addictive behaviours in antenatal care can be crucial in managing stress and promoting healthier pregnancies. A particularly troubling outcome of the study was the observed link between elevated stress levels and the presence of suicidal ideation. Participants who reported suicidal ideation had the highest mean PSS scores (28.6 ± 2.21). This highlights the severe emotional toll that stress can take on pregnant women and the importance of mental health screening during antenatal visits. Similar findings have been reported in other studies, where suicidal ideation in pregnant women was strongly linked to high levels of stress and mental health disorders[23,24], underscoring the need for timely mental health interventions to reduce the risk of adverse outcomes. The present study thus highlights the key factors associated with stress among antenatal mothers in rural Dakshina Kannada. Socio-economic challenges, previous abortion, marital and family conflicts, and addictive behaviours were significantly linked to higher stress levels.

Table 4: Relationship between High Perceived Stress level and selected risk factors

SNO.	RISK FACTORS	MEAN PSS SCORES		T VALUE	P VALUE
1	Age	≤ 30 Years	> 30 Years		
		11.33 ± 7.06	23.46 ± 5.39	10.2288	<0.0001*
2	Parity	Primigravida	Gravida II or more		
		9.68 ± 5.53	20.05 ± 8.00	10.7065	<0.0001*
3	Gestational age	≤ 32 Weeks	> 32 Weeks		
		13.62 ± 8.12	15.02 ± 9.37	0.9072	0.3654
4	Pregnancy intention	Intended	Not Intended		
		12.94 ± 7.89	25.2 ± 4.87	5.9164	<0.0001*
5	Socioeconomic status	Upper + Middle	Upper Lower + Lower		
		11.72 ± 6.58	17.75 ± 9.75	5.1380	<0.0001*
6	Addictive habits	Present	Absent		
		24.8 ± 5.21	13.6 ± 8.24	3.0189	0.0029*
7	Previous abortion	Yes	No		
		24.44 ± 4.12	13.37 ± 8.18	7.4323	<0.0001*
8	Death of close relative	Yes	No		
		13.88 ± 10.05	13.88 ± 8.30	0.0000	1.0000
9	Physical / psychological trauma from family	Yes	No		
		26.48 ± 4.25	11.68 ± 6.81	11.3107	<0.0001*
10	Marital conflict	Yes	No		
		24.43 ± 7.12	10.81 ± 5.81	12.9773	<0.0001*
11	Family conflict	Yes	No		
		20.47 ± 9.19	10.88 ± 5.91	8.7524	<0.0001*
12	Job related stress	Yes	No		
		25.11 ± 7.62	13.34 ± 8.02	4.3086	<0.0001*
13	Suicidal ideas	Yes	No		
		28.6 ± 2.21	11.72 ± 6.54	12.7736	<0.0001*

Table 5: Logistic regression of risk factors in stress

SNO.	RISK FACTORS	ODDS RATIO	P VALUE
1	Age	0.943	0.962
2	Parity	2.919	0.482
3	Pregnancy Intention	1.257	0.869
4	Socio Economic Status	0.068	0.012*
5	Addictive Habits	2.537	0.050
6	Previous Abortion	8.700	0.017*
7	Physical / Psychological trauma from family	0.299	0.453
8	Marital Conflict	3.810	0.043*
9	Family Conflict	3.756	0.039*
10	Job Related Stress	9.358	0.179
11	Suicidal Ideas	5.620	0.019*

CONCLUSION

The findings revealed that 63.07% of the participants experienced low stress, while 24.10% and 12.82% experienced moderate and high stress, respectively. Factors such as socio-economic status, previous abortion, marital conflict, family conflict, and suicidal thoughts were significantly associated with higher stress levels. The study highlights that antenatal mothers with a history of previous abortion, those experiencing marital and family conflicts, and those with lower socio-economic status are at a higher risk for stress, emphasizing the need for targeted interventions to address these factors in the antenatal care setting.

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