



DESCRIPTIVE CROSS-SECTIONAL STUDY OF SOCIO-DEMOGRAPHIC PROFILE, OBSTETRIC HISTORY AND CLINICAL STATUS OF PREGNANT WOMEN ATTENDING AN ANTENATAL CARE (ANC) CAMP

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ABSTRACT

Introduction: Antenatal camps are important for core maternal services, besides, the early identification of maternal health problems. The knowledge of sociodemographic, obstetric, medical and utilization profile of pregnant women is vital for successful camps.

Objectives: To study socio-demographic parameters, obstetric profile, and medical conditions among pregnant women visiting ANC camp, to calculate prevalence of anemia, under nutrition, hypertensive disorders, and diabetes in pregnancy, and to outline distribution of Gravida, Parity, Trimester, Medical risk factors, and utilization of ANC services.

Methods: The descriptive data of cross-sectional study of pregnant women registered at an ANC camp was collected using a pre-tested structured proforma and clinical records. The information obtained included socio-demographic factors, reproductive history, and use of ANC services. Clinical measurements included blood Hb estimation, anthropometry, BP measurement, and blood glucose. **Results:** A study of 61 pregnant women revealed prevalences of anemia, under-nutrition, hypertension during pregnancy, and glucose intolerance were 51%, 16%, 7%, and 10%, respectively. Most women were between 19–36 years old, had a mixed diet, and were in their second trimester.

Conclusion: Preventable and treatable conditions like anemia and undernutrition were common among pregnant women. Nutritional counseling and utilizing ANC camps for the early identification of high-risk pregnancies can strengthen the outcomes.

Keywords: Anemia, ANC services, Gestational Diabetes Mellitus, Hypertension, Under-nutrition.

INTRODUCTION

The period of pregnancy demands optimum maternal health care to favor both the mother and the fetus. However, Antenatal Care (ANC) plays a pivotal role in identifying complications during the period through clinical checkups, anemia, hypertension, gestational diabetes mellitus, besides immunization and nutritional supplementation⁽¹⁾.

Utilization of ANC services in India varies among women owing to their socio-economic conditions. Studies of urban poor populations reveal that education, occupation, and maternal age also influence ANC services⁽¹⁾. Studies from Karnataka highlight the socio-demographic factors affecting government health schemes in connection with early registration and visiting ANC⁽²⁾.

Studies from Mysore, Mangaluru and other parts of Karnataka also revealed the gaps in registrations process and even the comprehensive utilization of ANC^(3,5). Further, Anemia has been prevalent from mild to moderate levels among pregnant women⁽⁴⁾. NFHS-5 data further confirms the same concern, utilization of ANC camps owing to the social and behavioral factors⁽⁶⁾.

The present study in this scenario attempts to assess the socio-demographics, obstetric history, clinical status, and ANC service utilization among pregnant women attending an ANC camp.

OBJECTIVES

1. To assess the socio-demographic profile of pregnant women attending an ANC camp.
2. To describe the obstetric history including gravida, parity, trimester, and obstetric risk factors.
3. To determine the prevalence of anemia, undernutrition, hypertension, and diabetes in pregnancy.

MATERIALS AND METHODS

Study design: This study was conducted as a community-based cross-sectional program evaluation using retrospective analysis of routine ANC camp data.

Study area: This study took place in Urban Primary Health Centre (UPHC) that is known as the urban field practice area for Department of Community Medicine, CMCRI. The one-day prenatal check-up camp was arranged in UPHC Buddhanagara on 30 September 2025 in collaboration with Department of OBG, AYUSH, District Health & Family Welfare, CMCRI.

Study participants: All pregnant women who attended the ANC camp conducted at the UPHC and whose records were complete.

Study duration: The study was 2 months. The analysis and writing of the final report will be finished during this time, along with the extraction and entry.

Inclusion criteria

- Pregnant women residing in the UPHC Buddhanagara catchment area.
- Pregnant women who attended the antenatal screening camp.
- Pregnant women with available records of complete ANC check-ups.

Exclusion criteria

- Pregnant women having incomplete data.
- Pregnant women who visited for immunization or non-ANC visits only.

Sample size calculation:

The sample size was calculated to estimate the proportion of high-risk pregnancies detected during the ANC camp. Formula used:

$$\text{Sample size (n)} = \frac{Z^2 * p * q * DEFF}{d^2}$$

Where:

n = Required sample size.

Z = 1.96 (95% confidence interval).

p = anticipated prevalence of high-risk pregnancy = 50% (used to obtain maximum sample size due to lack of precise prior estimates).

q = 1 – p.

d = absolute precision = 10%.

DEFF = design effect = 1.5 (considering field-based camp setting).

Calculation:

$$\text{Sample size (n)} = \frac{(1.96)^2 * 0.5 * 0.5 * 1.5}{(0.10)^2} = 144$$

Thus, the minimum required sample size was 144 antenatal women at a 95% confidence level and 10% precision.

Sampling technique

Since the ANC camp was conducted on a single pre-specified day, universal sampling (total enumeration) was adopted. All pregnant women who attended the camp and had complete ANC records were included in the study.

Justification for sample size shortfall

Although the calculated sample size was 144, the final sample size depended on actual camp attendance on the day of service delivery.

- ANC camps are service-driven, not survey-driven
- Attendance is influenced by:
 - Registration status
 - Gestational age
 - Health-seeking behavior
 - Logistic and personal factors

Therefore, all eligible attendees present on the camp day were included, and the achieved sample size represents the true service coverage of the intervention, which is acceptable and methodologically valid for program evaluation and descriptive research.

Final sample

Although the calculation required 144, the final sample consisted of 61 women who attended and had complete records. This shortfall is justified as the study represents true service coverage of a service-driven intervention.

Method of data collection:

These were done retrospectively using structured records kept during the camp. To extract variables, a data extraction Proforma was designed.

Data collection tools:

- A pre-tested, pre-defined, pre-validated semi-structured Antenatal care (ANC) Screening Proforma was employed in this camp.
- Documentation Tools of IEC.
- The evaluation is done using retrospective analysis of routine ANC camp data as part of SwasthNaari Sashakth Bharath Abhiyan.

Statistical analysis: Data were analyzed using IBM SPSS Statistics after being entered in Microsoft Excel, with prior data cleaning and validation. Descriptive statistics summarized findings, presenting categorical variables as frequencies and percentages, and continuous variables as means with standard deviations or medians with interquartile ranges. Associations between categorical

variables were evaluated using the Chi-square test or Fisher's exact test, considering a p-value of <0.05 as statistically significant. Results were displayed in tables and charts.

RESULTS: TABLES

Table 1: Distribution of Pregnant Women by Socio-Demographic Characteristics (n=61)

Characteristic	Category	Frequency (n)	Percentage (%)
Age (years)	19	6	9.8
	24	7	11.5
	28	8	13.1
	Others	40	65.6
Diet Type	Mixed	59	96.7
	Vegetarian	2	3.3
Sleep Pattern	Normal	54	88.5
	Irregular	7	11.5
Appetite	Normal	59	96.7
	Irregular	2	3.3
Occupation	Housewife	54	88.5
	Employed	7	11.5
Education	Secondary/Higher	37	60.7
	Primary/Illiterate	24	39.3

The 61 pregnant women had a mean age of 25.5 years (median: 28 years, range: 19-36 years). Most were on a mixed diet (96.7%), had normal sleep/appetite (88.5%), were housewives (88.5%), and had secondary/higher education (60.7%). Most were from the lower-middle socio-economic class (monthly income ₹10,001-20,000).

Table 2: Distribution by Gravida, Parity and Trimester of Pregnancy (n=61)

Variable	Category	Frequency (n)	Percentage (%)
Gravida	G1 (Primigravida)	27	44.3
	G2	24	39.3
	G3	7	11.5
	G4	3	4.9
Trimester	1st Trimester	9	14.8
	2nd Trimester	32	52.5
	3rd Trimester	20	32.8
Parity	Nulliparous (P0)	27	44.3
	Multiparous (P≥1)	34	55.7

Most participants were primigravida (44.3%) or multigravida, with more than half being multiparous (55.7%). At the time of the ANC visit, the majority were in the second trimester (52.5%), followed by third trimester (32.8%) and first trimester (14.8%). The mean gestational age was 21.3 weeks.

Table 3: Prevalence of Selected Clinical Conditions Among Pregnant Women (n=61)

Clinical Condition	Category	Frequency (n)	Percentage (%)
Hemoglobin Status	Normal (≥ 11 g/dL)	30	49.2
	Mild Anemia (9-10.9 g/dL)	22	36.1
	Moderate Anemia (7-8.9 g/dL)	9	14.8
	Total Anemia	31	50.8
BMI Status	Underweight (<18.5)	10	16.4

	Normal (18.5-24.9)	14	23.0
	Overweight (25-29.9)	8	13.1
	Obese (≥ 30)	29	47.5
	Total Malnutrition	47	77.0
Blood Pressure	Normal	57	93.4
	Gestational Hypertension	4	6.6
Blood Glucose Status	Normal	55	90.2
	GDM Suspected	5	8.2
	Overt Diabetes	1	1.6

Clinical evaluation indicated that approximately 50.8% of pregnant women suffered from anemia, the majority of which was mild (36.1%) and moderate (14.8%). The assessment of nutritional status revealed very high levels of malnutrition (77%) in the population studied, with almost half (47.5%) being obese. Blood pressure was normal in almost all women (93.4%), whereas a small percentage (6.6%) had gestational hypertension. Blood glucose levels were normal in most women (90.2%), while 8.2% were suspected of having gestational diabetes and 1.6% had overt diabetes.

Table 4: Distribution of Obstetric and Medical Risk Factors (n=61)

Risk Factor	Category	Frequency (n)	Percentage (%)
Previous Obstetric History	Previous Abortion	3	4.9
	Normal Vaginal Delivery	1	1.6
Medical History	Diabetes Mellitus	3	4.9
	Thyroid Disorder	2	3.3
	Hypertension	1	1.6
	Seizures	1	1.6
	Tuberculosis	1	1.6
No Identifiable Risk Factor		49	80.3

Obstetric and medical risk factors that potentially affect pregnancy outcomes were tested for in the research population. The study population was screened for obstetric and medical risk factors that could influence pregnancy outcomes. Among the 61 women, 49 (80.3%) had no previous medical or obstetric history. However, 12 women (19.7%) had at least one identifiable risk factor. Common risk factors identified included previous abortion (4.9%, 3/61), diabetes mellitus (4.9%, 3/61), hypertension (1.6%, 1/61), thyroid disorder (3.3%, 2/61), and previous seizures (1.6%, 1/61). One woman (1.6%) had multiple risk factors including diabetes, hypertension, and asthma.

DISCUSSION

The present study is thus intended to take up the maternal health profile of women enrolled in urban ANC thereby, provide an overview on the pregnancy health profile. The research also seeks to discover issues even with a better outreach. The study population belonged to the reproductive age group and had moderate educational level. Moreover, NFHS-5 reports reveal that women's education and reproductive age play a key role in ANC utilization^(7,8). The research also noted that women who attended the ANC camps were knowledgeable about the existing health services.

Mid-pregnant primi and multipara were represented in the obstetric data. However, even with the expansion of antenatal coverage, studies based on NFHS-5 indicate that early initiation is still low in many areas^(7,8). To resolve the situation, community ANC camps may be the best approach to have contact with women that are still considering taking medical services during pregnancy.

The most common problem was anaemia again in line with the national estimates reported by Kuppusamy et al. (2024) anaemia continues to be of public health significance in India⁽⁹⁾. Despite

it is a public health program, iron supplementation does not solve the problem among women from lower social-economical classes. The results are consistent with those reported by Girotra et al. (2023) on the adequacy and quality of ANC as well as regular haemoglobin monitoring and nutritional support besides just the frequency of visits⁽⁷⁾.

The study demonstrates the problem of chronic under-nutrition. Obesity during pregnancy is also a similar challenge and mirrors the nutritional shift encountered in national studies⁽⁹⁾. Obesity and maternal overweight are risk factors for gestational diabetes and hypertensive disorders. Revathi et al. (2025) reported that there is an increased occurrence of transitions during pregnancy primarily because of changing lifestyle and urbanization⁽¹⁰⁾. Even our current ANC camp results seem to suggest the trend.

Some of the women had hypertension and abnormal glucose, which is consistent with findings at national level. The ICMR-INDIAB studies show the huge presence of gestational diabetes in the country, with exception to higher susceptibility rates among urban⁽¹¹⁾. In a parallel manner, Revathi et al. The hypertension was found to be the main contributor of maternal morbidity⁽¹⁰⁾. Provision of routine blood pressure and glucose screening as part of this camp also help to identify early the problem for proper management of morbid maternal and fetal conditions.

Most of the women showed obstetric or medical risk factors, thus the importance of assessing them during the antenatal period. As indicated by Kumar et al. (2025), the gaps in the usage of ANC services for the most vulnerable members of the population require appropriate attention⁽¹²⁾. ANC camps can be effective in improving the health of expectant mothers and addressing the systemic issues.

Conclusions & Recommendations

This study underscores the pressing burden of preventable and curable health conditions among women attending ANC in urban India, revealing high rates of anemia, a rising epidemic of overweight and obesity, and ongoing hypertension and glycemic issues. It advocates for quality-based screening during ANC visits to detect nutrition-related and metabolic abnormalities for timely intervention and health education. The ANC camp model proves to be a viable outreach platform to enhance maternal healthcare. Key recommendations include scaling up ANC camps with standardized point-of-care screenings and expanding outreach to high-risk and non-attending women. The study is strengthened by direct measurements of health indicators like hemoglobin and blood glucose rather than relying on self-reports and utilizes data from a routine government-supported ANC camp, ensuring relevance. However, limitations include potential selection bias due to the focus on women attending the camp and questions about the generalizability of findings due to a small, single-centre sample size.

Author Declarations

Conflicts of interest: None

Ethics approval and consent to participate: This research work was carried out adhering to the ethics mentioned in the Declaration of Helsinki. The Institutional Review Committee gave its consent to perform the research. The research work was carried out after obtaining consent from the participants. Confidentiality and privacy were maintained confidentially. There were no direct procedures that needed to be followed. Only the routine investigations during ante-natal visits were done.

Relevance of the study: In this study, the data on the sociodemographic, obstetrical, and clinical profile of pregnant women attending an urban ANC local camp is presented. The study draws attention to rampant anemia which is common along with the emerging dual burden of malnutrition, hypertension and glycemic risks. The findings underscore the need for quality-focused screening and strengthen the evidence base for community-linked ANC initiatives.

Acknowledgement: The authors acknowledge Dean and Director, CMCRI, for support and guidance. The authors would like to sincerely thank all the pregnant women who took part in their

study and also thank all the medical officers, nursing staff, laboratory technicians, and field staff involved in arranging and executing the antenatal care camp for their active cooperation and help. The authors acknowledge their gratitude to the HOD, Department of Community Medicine for their support during their study.

Author contributions: All authors have equally contributed to conceptualising the design, data acquisition, and manuscript preparation, editing and review.

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