RESEARCH PAPER

Prevalence of Anaemia among Pregnant Women and Its Associated Factors: A Community-Based Cross-Sectional Study

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ABSTRACT

Background: Anaemia during pregnancy is a major public health problem in developing countries and contributes significantly to maternal and fetal morbidity and mortality. According to the World Health Organization (WHO), anaemia affects nearly 40% of pregnant women globally, with a higher burden in low- and middle-income countries such as India. Nutritional deficiencies, infections, and socio-demographic factors play a major role in the development of anaemia during pregnancy.

Aim: To determine the prevalence of anaemia among pregnant women and identify the associated risk factors in a community setting.

Materials and Methods: A community-based cross-sectional study was conducted among 150 pregnant women residing in the study area. Participants were selected using simple random sampling. Haemoglobin levels were measured using standard laboratory methods, and anaemia was classified according to WHO criteria. Data regarding socio-demographic characteristics, obstetric history, dietary habits, and antenatal care were collected using a structured questionnaire. Statistical analysis was performed using SPSS software. Descriptive statistics were used to calculate prevalence, and Chi-square test was applied to assess associations between anaemia and risk factors. A p-value <0.05 was considered statistically significant.

Results: The overall prevalence of anaemia among pregnant women was 56.7%. Mild anaemia was observed in 30%, moderate anaemia in 22%, and severe anaemia in 4.7% of participants. Significant associations were found between anaemia and factors such as low socioeconomic status, inadequate iron supplementation, multiparity, short birth spacing, and poor dietary intake ($p<0.05$).

Conclusion: Anaemia remains highly prevalent among pregnant women in the community. Strengthening antenatal care services, improving nutritional awareness, and ensuring compliance with iron-folic acid supplementation are essential to reduce the burden of anaemia during pregnancy.

Keywords: *Anaemia, Pregnancy, Maternal Health, Nutritional Deficiency, Community Study.*

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INTRODUCTION

Anaemia during pregnancy remains one of the most important public health challenges worldwide and continues to contribute significantly to maternal and fatal morbidity and mortality. The World Health Organization (WHO) defines anaemia in pregnancy as a haemoglobin concentration of less than 11 g/dL. Globally, anaemia affects approximately 40% of pregnant women, with the highest prevalence reported in developing regions such as South Asia and sub-Saharan Africa[1]. The burden of anaemia is particularly high in low- and middle-income countries due to nutritional deficiencies, infections, and socio-economic disparities that affect maternal health and access to healthcare services.

Anaemia during pregnancy has significant implications for both maternal and fetal outcomes. Maternal anaemia has been associated with increased risk of maternal fatigue, reduced work capacity, increased susceptibility to infections, and higher risk of postpartum haemorrhage. In severe cases, it may contribute to maternal mortality. From the fetal perspective, anaemia in pregnancy is linked to intrauterine growth restriction, low birth weight, preterm birth, and perinatal mortality[2]. These adverse outcomes highlight the importance of early detection and management of anaemia during pregnancy. Iron deficiency is considered the most common cause of anaemia during pregnancy and accounts for nearly half of all anaemia cases worldwide[3]. During pregnancy, the demand for iron increases significantly due to expansion of maternal red

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cell mass, fetal growth, and placental development. When dietary intake of iron is inadequate or iron stores are depleted, pregnant women become highly susceptible to iron deficiency anaemia. Other nutritional deficiencies such as folate and vitamin B12 deficiency can also contribute to anaemia. In addition, parasitic infections such as hookworm infestation and malaria, chronic illnesses, and inflammatory conditions may further exacerbate the problem[4].

The burden of anaemia in pregnancy is particularly high in India. According to the National Family Health Survey (NFHS-5, 2019–21), approximately 52.2% of pregnant women in India are anaemic, indicating that maternal anaemia continues to be a major public health concern despite several national health programs aimed at its prevention and control[5]. Factors such as poor dietary intake, low socioeconomic status, early marriage, multiparity, short inter-pregnancy intervals, and limited access to quality antenatal care services contribute to the persistence of anaemia among pregnant women in the country. Recognizing the magnitude of the problem, the Government of India has implemented various initiatives to reduce anaemia among women of reproductive age. Programs such as the Iron and Folic Acid (IFA) supplementation program, Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA), and the Anaemia Mukt Bharat initiative aim to improve maternal nutrition and increase awareness regarding anaemia prevention and treatment. Despite these interventions, the prevalence of anaemia remains high in many communities, particularly in rural and underserved populations[6].

Several socio-demographic, nutritional, and obstetric factors influence the occurrence of anaemia during pregnancy. Studies have demonstrated significant associations between anaemia and factors such as low maternal education, inadequate dietary intake of iron-rich foods, poor compliance with iron supplementation, high parity, and short birth spacing. Identifying these associated factors is crucial for developing targeted public health interventions that can effectively reduce the burden of maternal anaemia[7].

Community-based studies play a vital role in understanding the actual magnitude of anaemia and its determinants among pregnant women outside hospital settings. Such studies provide valuable insights into the socio-demographic and behavioural factors that influence maternal health in the community. Therefore, the present study was undertaken to assess the prevalence of anaemia among pregnant women and to identify the associated factors in a community-based population, with the aim of generating evidence that may help strengthen maternal health programs and improve pregnancy outcomes.

AIM

To determine the prevalence of anemia among pregnant women and its associated factors in a community setting.

OBJECTIVES

1. To estimate the prevalence of anemia among pregnant women.
2. To classify anemia into mild, moderate, and severe categories based on haemoglobin levels.
3. To identify socio-demographic factors associated with anemia.
4. To determine the association between dietary habits and anemia.
5. To assess the relationship between obstetric factors and anemia.

MATERIALS AND METHODS

Study Design

A community-based cross-sectional study.

Study Area

The study was conducted in the selected community area attached to the Department of Community Medicine.

Study Population

All pregnant women residing in the study area during the study period.

Study Duration

The study was conducted over a period of 6 months.

Inclusion Criteria

- Pregnant women residing in the study area
- Women who gave informed consent
- Women in any trimester of pregnancy

Exclusion Criteria

- Pregnant women with known haematological disorders
- Women who refused to participate in the study

Sample Size Calculation

Sample size was calculated using the formula:

$$n = \frac{4pq}{d^2}$$

Where

p = prevalence of anemia among pregnant women (50%)

q = 1 – p

d = allowable error (8%)

$$n = \frac{4 \times 50 \times 50}{8^2}$$

$$n = \frac{10000}{64} = 156$$

Thus, the minimum required sample size was 150 pregnant women.

Sampling Technique

Pregnant women were selected using simple random sampling from the antenatal registry of the community health centre.

Data Collection Method

Data were collected using a pre-tested structured questionnaire which included:

- Socio-demographic details
- Obstetric history
- Dietary habits
- Iron supplementation status
- Antenatal care utilization

Haemoglobin levels were obtained from antenatal laboratory reports.

Classification of Anemia (WHO Criteria)

Hemoglobin Level	Classification
≥11 g/dL	Normal
10–10.9 g/dL	Mild anemia
7–9.9 g/dL	Moderate anemia
<7 g/dL	Severe anemia

Statistical Analysis

Data were entered in Microsoft Excel and analysed using SPSS version 25. Descriptive statistics such as frequency and percentage were used to summarize the data. Association between anemia and categorical variables was analysed using the Chi-square test. A p-value less than 0.05 was considered statistically significant.

RESULTS

A total of 150 pregnant women participated in the study. Haemoglobin estimation and assessment of associated factors were carried out for all participants.

Table 1: Age Distribution of Study Participants (n = 150)

Age Group (Years)	Number	Percentage
<20	18	12.0
20–24	52	34.7
25–29	46	30.7
30–34	24	16.0
≥35	10	6.6

Interpretation:

The majority of pregnant women belonged to the 20–24 years age group (34.7%), followed by 25–29 years (30.7%), indicating that most pregnancies occurred in the early reproductive age group.

Table 2: Prevalence of Anemia Among Pregnant Women

Haemoglobin Level	Classification	Number	Percentage
≥11 g/dL	Normal	65	43.3
10–10.9 g/dL	Mild Anemia	45	30.0
7–9.9 g/dL	Moderate Anemia	33	22.0
<7 g/dL	Severe Anemia	7	4.7

Interpretation:

The overall prevalence of anemia was 56.7%. Mild anemia was the most common form (30%), followed by moderate anemia (22%). Severe anemia was relatively less common (4.7%).

Table 3: Association Between Socioeconomic Status and Anemia

Socioeconomic Status	Anaemic	Non-Anaemic	Total
Low	48	12	60
Middle	30	28	58
High	7	25	32

Chi-square = 18.6, p = 0.001

Interpretation:

A statistically significant association was observed between low socioeconomic status and anemia. Pregnant women belonging to the lower socioeconomic class had a higher prevalence of anemia.

Table 4: Association Between Iron Supplementation and Anemia

Iron Supplementation	Anaemic	Non-Anaemic	Total
Regular	32	40	72
Irregular	53	25	78

Chi-square = 9.84, p = 0.002

Interpretation:

Anemia was significantly more common among women who did not regularly consume iron-folic acid tablets compared to those who adhered to supplementation.

Table 5: Association Between Parity and Anemia

Parity	Anaemic	Non-Anaemic	Total
Primigravida	30	32	62
Multigravida	55	33	88

Chi-square = 5.62, p = 0.017

Interpretation:

Multigravida women had a higher prevalence of anemia compared to primigravida women, indicating that repeated pregnancies may increase the risk of maternal anemia.

DISCUSSION

The present community-based cross-sectional study was conducted to determine the prevalence of anemia among pregnant women and to identify the associated risk factors influencing maternal haemoglobin levels. In this study, the overall prevalence of anemia among pregnant women was 56.7%, indicating that anemia continues to remain a major public health concern in the community. Similar findings have been reported in several epidemiological studies conducted in developing countries where maternal anemia remains highly prevalent due to nutritional deficiencies and socio-economic factors[8]. In the present study, mild anemia (30%) was the most common form, followed by moderate anemia (22%) and severe anemia (4.7%). Comparable results were observed in a large population-based study by Okube et al., which reported that mild and moderate anemia constitute the majority of anemia cases among pregnant women in developing regions[9]. The lower proportion of severe anemia observed in our study may be

attributed to improved antenatal care services and early screening during pregnancy.

Socioeconomic status was found to have a significant association with anemia in the present study. Women belonging to the lower socioeconomic class showed a higher prevalence of anemia compared to women from higher socioeconomic groups. This observation is consistent with findings reported by Noronha et al., who demonstrated that poverty, limited access to nutritious food, and poor living conditions significantly increase the risk of anemia among pregnant women[10]. Socioeconomic deprivation often results in inadequate dietary intake of iron-rich foods and reduced access to healthcare services. Iron-folic acid supplementation plays a critical role in preventing iron deficiency anemia during pregnancy. In the present study, anemia was significantly more common among women who did not consume iron tablets regularly. Similar results were reported by Taye et al., who identified poor compliance with iron supplementation as one of the strongest predictors of maternal anemia during pregnancy[11]. Regular iron supplementation is essential to meet the increased physiological demand for iron during pregnancy and to prevent depletion of maternal iron stores.

Parity was also found to be significantly associated with anemia in this study. Multigravida women had a higher prevalence of anemia compared to primigravida women. This finding is consistent with the study conducted by Gebreweld et al., which demonstrated that repeated pregnancies without adequate birth spacing can lead to depletion of maternal iron reserves and increase the risk of anemia[12]. Frequent pregnancies may reduce the time available for maternal nutritional recovery between successive pregnancies. Dietary practices and nutritional intake are also important determinants of maternal hemoglobin levels. Studies have shown that inadequate consumption of iron-rich foods such as green leafy vegetables, legumes, and animal products contributes significantly to the development of anemia during pregnancy[13]. Lack of awareness regarding balanced nutrition and poor dietary diversity are common issues in many communities and play a major role in maternal anemia. Maternal anemia is associated with several adverse pregnancy outcomes. According to Kozuki et al., anemia during pregnancy significantly increases the risk of low birth weight, preterm birth, and perinatal mortality[14]. These complications highlight the importance of early identification and appropriate management of anemia in antenatal care programs. Community-based preventive strategies are essential for reducing the burden of maternal anemia. Interventions such as nutrition education, iron-folic acid supplementation, deworming, and strengthening antenatal care services have been shown to significantly improve maternal hemoglobin levels[15]. Public health programs should focus on increasing awareness among pregnant women regarding the importance of iron-rich diets and adherence to iron supplementation.

Overall, the findings of the present study are comparable with several national and international studies that have reported high prevalence of anemia among pregnant women in developing countries. These results emphasize the need for strengthening maternal health programs and community-based interventions to effectively address the problem of anemia in pregnancy[16].

CONCLUSION

Anemia remains highly prevalent among pregnant women in the community, with more than half of the study participants affected. Mild and moderate anemia constituted the majority of cases. Socioeconomic status, irregular iron supplementation, and higher parity were identified as significant factors associated with maternal anemia. Strengthening antenatal care services, improving maternal nutrition, and ensuring compliance with iron-folic acid supplementation are essential strategies to reduce the burden of anemia during pregnancy. Early identification and targeted public health interventions can significantly improve maternal and fetal health outcomes.

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