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# Prevalence of Anemia and its Socioeconomic Determinants in Pregnant Women Attending Antenatal Clinic at Lahore General Hospital, Lahore, Pakistan

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## Abstract

**Introduction:** Anemia is a prevalent condition among pregnant women and significantly contributes to maternal and fetal morbidity. This study aimed to evaluate the prevalence of anemia and its association with various socioeconomic factors among pregnant women attending the antenatal clinic at Lahore General Hospital (LGH), Lahore.

**Methods:** A cross-sectional study was conducted at LGH from September 1 to 30, 2022. A total of 224 pregnant women were selected through non-probability convenience sampling. Data on demographics and socioeconomic factors were collected via a structured questionnaire. Hemoglobin levels were measured using standard CBC analyzers. Associations between anemia (hemoglobin <11.0 g/dL) and socioeconomic variables were analyzed using the chi-square test ($p<0.05$ considered significant).

**Results:** The prevalence of anemia was 70.1% (n=157). A significant association was found between anemia and monthly household income ($p=0.03$) and family structure ($p=0.004$). No significant association was found with education level, employment status, or meal frequency.

**Conclusion:** Income and family structure are key determinants of anemia prevalence in this population. These findings underscore the importance of addressing social and economic conditions in maternal health interventions.

**Keywords:** Anemia, Pregnancy, Socioeconomic Factors, Maternal Health, Antenatal Care

## Introduction

Anemia during pregnancy remains a major public health concern, particularly in developing countries. It is associated with increased risks of maternal morbidity, preterm birth, and low birth weight. The World Health Organization (WHO) estimates that globally, approximately 36% of pregnant women are anemic, with prevalence in developing countries ranging from 35% to 75% [1]. In Pakistan, the prevalence of iron deficiency anemia among pregnant women is reported to be between 70% and 80% [2,3].

The etiology of anemia in pregnancy is multifactorial, including nutritional deficiencies, socioeconomic disparities, and cultural dietary habits. South Asian diets, often cereal-based and low in bioavailable iron, contribute significantly to the burden [4].

This study aims to assess the prevalence of anemia among pregnant women attending the antenatal clinic at LGH, Lahore, and to explore its association with socioeconomic variables such as education, income, employment, and family structure.

## Materials and Methods

**Study Design and Duration:** This cross-sectional study was conducted at the antenatal clinic of Lahore General Hospital (LGH), Lahore, from September 1 to 30, 2022.

**Study Population and Sampling:** A total of 224 pregnant women aged 18-45 years were included using non-probability convenience sampling.

**Inclusion Criteria:** - Pregnant women providing written informed consent

**Exclusion Criteria:** - Women with previously diagnosed hematological disorders - Refusal to participate - Healthcare professionals or their spouses

**Ethical Approval:** The study was approved by the Institutional Review Board of Lahore General Hospital (IRB/LGH/2022/09-01). Written informed consent was obtained from all participants.

**Data Collection:** A structured questionnaire was used to collect data on age, education level, employment status, family structure (nuclear or joint), monthly household income, and daily meal frequency. Hemoglobin levels were measured using automated hematology analyzers (Sysmex XN-1000), following standard quality control procedures.

**Statistical Analysis:** Data were analyzed using SPSS version 26.0. Descriptive statistics were computed. The chi-square test was used to evaluate associations between anemia and socioeconomic variables. A p-value <0.05 was considered statistically significant.

## Results

The mean age of participants was 30 years (range: 19–40 years). Among the 224 pregnant women: - 60% were under 30 years old - 99% were married - 55% had undergraduate-level education - 89% were housewives - 70% lived in joint families - 80% had a household income of PKR 50,000 or above - 70% consumed fewer than three meals per day - 70.1% (n=157) had anemia (Hb <11.0 g/dL)

**Table 1. Association of Socioeconomic Variables with Anemia**

| Variable | Category | Anemic (%) | Non-Anemic (%) | p-value |
|---|---|---|---|---|
| Family Structure | Joint (n=157) | 115 (73.2) | 42 (26.8) | 0.004 |
| | Nuclear (n=67) | 42 (62.7) | 25 (37.3) | |
| Monthly Income | < PKR 50,000 (n=45) | 38 (84.4) | 7 (15.6) | 0.03 |
| | ≥ PKR 50,000 (n=179) | 119 (66.5) | 60 (33.5) | |
| Education (Patient) | Undergraduate (n=124) | 86 (69.4) | 38 (30.6) | 0.52 |
| | Graduate/Postgraduate (n=100) | 71 (71.0) | 29 (29.0) | |
| Employment Status (Patient) | Housewife (n=200) | 141 (70.5) | 59 (29.5) | 0.84 |
| | Employed (n=24) | 16 (66.7) | 8 (33.3) | |
| Meal Frequency | <3 meals/day (n=157) | 109 (69.4) | 48 (30.6) | 0.65 |
| | ≥3 meals/day (n=67) | 48 (71.6) | 19 (28.4) | |

## Discussion

This study revealed a high prevalence (70.1%) of anemia among pregnant women at LGH, which aligns with existing data from Pakistan and other South Asian countries [2,5]. Joint family structure and low household income were significantly associated with increased anemia prevalence. These associations may reflect the challenges of resource distribution and dietary prioritization in joint households [6].

Contrary to expectations, education level, employment status, and meal frequency showed no significant association. These findings suggest that awareness alone may not translate into improved nutritional status without economic support and household autonomy.
The lack of association with meal frequency further implies that nutrient quality, rather than quantity, may be the determining factor.
**Limitations:** - The cross-sectional design limits causal inferences. - Convenience sampling may reduce generalizability. - Potential confounding factors, such as supplement use, were not assessed.

## Conclusion

Anemia remains highly prevalent among pregnant women at LGH. Socioeconomic factors, particularly low income and joint family living, significantly influence anemia rates. Interventions should prioritize nutritional education, iron supplementation, and tailored support for low-income joint families.

**Author Contributions** - **Dr. Rozina Shahadat Khan:** Supervision, methodology validation, manuscript revision - **Ali Huzaifa:** Initial draft, data analysis - **Haris Hanif:** Conceptualization, data collection

**Ethical Approval:** Approved by the Institutional Review Board of Lahore General Hospital (IRB/LGH/2022/09-01).
**Informed Consent:** Written informed consent was obtained from all participants.
**Conflict of Interest:** The authors declare no competing interests.
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