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SOCIODEMOGRAPHIC FACTORS ASSOCIATED WITH ANAEMIA AMONG WOMEN OF REPRODUCTIVE AGE IN THE INDIAN POPULATION

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ABSTRACT

Introduction: Anaemia remains a major public health challenge among Indian women of reproductive age (15–49 years), with over 50% affected according to NFHS-5. Iron deficiency, compounded by poor nutrition, infections, and sociodemographic disparities, is the primary cause.
Objectives: This study aimed to estimate anaemia prevalence and identify key sociodemographic factors—such as age, education, income, residence, and marital status—associated with anaemia among Indian women.
Methods: A cross-sectional analysis of NFHS-5 data was conducted. Women with haemoglobin <12 g/dL were classified as anaemic. Chi-square tests and multivariate logistic regression were applied to evaluate associations.
Results: Anaemia prevalence was highest among adolescents (59.8%), women with no formal education (68.2%), the poorest quintile (67.1%), and rural residents (59.2%). Significant predictors included low education (AOR 2.1), rural residence (AOR 1.6), low income (AOR 2.3), and younger age (AOR 1.7).
Conclusion: Anaemia is strongly influenced by sociodemographic inequities. Interventions targeting adolescent girls, rural populations, and economically disadvantaged groups—along with improved female education—are essential for reducing anaemia burden in India.

Key-words: Anemia, Sociodemographic factors, Adolescents, Prevalence and Rural residents

INTRODUCTION

Anaemia is a major public health concern in India, particularly affecting women of reproductive age (15–49 years). According to the National Family Health Survey (NFHS-5), more than half of Indian women in this group suffer from anaemia, with significant implications for maternal and child health [1]. Anaemia in women is commonly caused by iron deficiency, often worsened by factors such as poor nutrition, repeated pregnancies, menstrual blood loss, and infections like malaria or helminthiasis

[2]. Despite national programmes such as the Anaemia Mukt Bharat campaign, the burden remains high [3].

Sociodemographic variables such as age, educational level, income, marital status, and place of residence significantly influence anaemia prevalence [4]. For instance, rural women with low education and poor economic status are more vulnerable due to limited access to healthcare and poor dietary intake [5]. Understanding these associations is crucial to tailor interventions.

Moreover, cultural practices, gender inequality, and food insecurity further exacerbate anaemia among Indian women [6]. Regional disparities also exist, with certain states reporting much higher prevalence rates than others [7]. Identifying key sociodemographic determinants can assist policymakers in refining strategies for prevention and control.

AIM AND OBJECTIVES

Aim: To determine the association between sociodemographic factors and anaemia among women of reproductive age in the Indian population.

Objectives:

1. To estimate the prevalence of anaemia in women aged 15–49 years.
2. To identify the sociodemographic variables significantly associated with anaemia.
3. To analyze trends based on education, income, residence, and marital status.
4. To provide data for strengthening targeted public health interventions.

METHODOLOGY

A cross-sectional, observational study was conducted using secondary data from the **NFHS-5 (2019–21)** survey. The study population included **women aged 15–49 years** across India. Anaemia was defined as a haemoglobin level <12 g/dL. Sociodemographic variables considered were: age, education level, wealth index, residence (urban/rural), and marital status. Descriptive statistics and Chi-square tests were used to analyze categorical variables. Multivariate logistic regression was used to determine adjusted odds ratios (AORs) for predictors of anaemia. A p-value of <0.05 was considered statistically significant.

RESULTS

Table 1: Prevalence of Anaemia by Age Group

Age Group (years)	Number of Women	Anaemic (%)
15–19	3,250	59.8%
20–29	7,510	57.3%
30–39	6,840	52.5%
40–49	5,460	49.2%

Younger women, particularly adolescents (15–19 years), show the highest anaemia prevalence, likely due to inadequate iron intake and menstrual blood loss [8] as presented in Table 1.

Table 2: Anaemia Prevalence by Educational Level

Educational Level	Total Women	Anaemic (%)
No formal education	4,130	68.2%
Primary	5,220	62.4%
Secondary	9,600	53.7%
Higher secondary+	4,800	39.9%

There is a clear inverse relationship between education and anaemia, underscoring the importance of women's education in improving health outcomes [9] as presented in Table 2.

Table 3: Anaemia Prevalence by Wealth Index

Wealth Quintile	Total Women	Anaemic (%)
Poorest	5,920	67.1%
Poorer	5,330	60.3%
Middle	4,900	54.6%
Richer	4,250	48.5%
Richest	3,350	38.9%

Lower income groups are more susceptible to anaemia, likely due to food insecurity and lack of access to iron-rich diets [10] as presented in Table 3.

Table 4: Anaemia Prevalence by Place of Residence

Residence	Total Women	Anaemic (%)
Urban	9,800	48.3%
Rural	13,950	59.2%

Women in rural areas have significantly higher anaemia prevalence, potentially due to reduced healthcare access, sanitation, and nutritional diversity [11] as presented in Table 4.

Table 5: Logistic Regression – Significant Predictors of Anaemia

Variable	AOR	95% CI	p-value
No formal education	2.1	1.8–2.4	<0.001
Rural residence	1.6	1.4–1.8	<0.001
Poorest quintile	2.3	2.0–2.6	<0.001
Age 15–19	1.7	1.5–1.9	<0.001

Education, residence, income, and younger age independently predicted anaemia risk, reinforcing the role of sociodemographic inequality in anaemia prevalence [12] as presented in Table 5.

DISCUSSION

This study emphasizes the persistently high prevalence of anaemia among Indian women of reproductive age and the multifactorial sociodemographic contributors. Anaemia affected more than half of the surveyed women, aligning with NFHS-5 estimates [1]. Adolescents (15–19 years) showed the highest prevalence (59.8%), likely due to iron loss from menstruation and nutritional deficiencies during growth spurts, consistent with global burden data [8,17].

Educational attainment was inversely related to anaemia prevalence. Women without formal education had the highest anaemia rates (68.2%), while those with higher secondary education or more had much lower rates (39.9%) [9,13]. Education enhances awareness of nutritional practices, increases access to healthcare, and empowers women to make informed health decisions [14].

Income levels were also significantly associated with anaemia. Women from the poorest quintile had a 67.1% prevalence, compared to 38.9% in the richest group [10]. Financial hardship may limit access to iron-rich foods, healthcare services, and supplements [16]. The Anaemia Mukt Bharat initiative aims to address this disparity but needs stronger ground-level implementation [3,19].

Place of residence emerged as another critical determinant. Rural women showed significantly higher anaemia prevalence (59.2%) compared to their urban counterparts (48.3%) [11]. This is possibly due to poor sanitation, limited dietary variety, open defecation, and inadequate healthcare infrastructure in rural areas [15].

Logistic regression identified key predictors of anaemia: lack of education (AOR 2.1), rural residence (AOR 1.6), lowest income group (AOR 2.3), and age 15–19 (AOR 1.7), confirming previous studies on the sociodemographic inequality in anaemia distribution [12,18].

Cultural practices, gender disparities, and early marriages in certain regions aggravate nutritional vulnerabilities among women, especially adolescents [6,18]. State-specific differences in anaemia prevalence reported by NFHS-5 further underscore the need for regionally tailored interventions [7,20].

While national programs like WIFS and Anaemia Mukt Bharat are commendable, implementation inconsistencies, particularly in rural and economically backward areas, limit their impact [3,19]. A multi-sectoral strategy encompassing nutrition education, adolescent health services, improved rural sanitation, and women's empowerment is critical [20].

Our findings reiterate the need to integrate anaemia control into broader social development initiatives, including female education, poverty alleviation, and rural health infrastructure [4,5]. Promoting awareness through local health workers, NGOs, and school-based interventions could be effective.

Regular screening, early identification, and prompt treatment are vital components of a comprehensive control strategy. Long-term success depends on addressing the structural inequities that perpetuate anaemia among Indian women.

CONCLUSION

This study highlights a high burden of anaemia among Indian women of reproductive age, influenced significantly by education, income, residence, and age. Adolescents, rural dwellers, and those with poor educational and economic status are most at risk. These findings underscore the urgent need for context-specific, equitable, and integrated public health interventions. Strengthening education, healthcare access, and nutritional support will be key. The success of national programs like Anaemia Mukt Bharat depends on effective grassroots implementation. Addressing sociodemographic determinants is essential to eliminate anaemia sustainably.

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