

Epidemiological Assessment of Anaemia and Associated Socio-Economic Factors Among Rural Adolescent Girls in Maharashtra

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Abstract--Anemia remains a major public health challenge among adolescent girls in India, particularly in rural regions, where nutritional deficiencies and socioeconomic disparities are common. Adolescent girls are at heightened risk of anemia due to rapid physical growth, menstrual blood loss, and limited access to nutritious diets and preventive health services. Objective to estimate the prevalence of anemia and examine its association with socio-economic and demographic determinants among adolescent girls in rural Maharashtra, India.

Keywords-- Adolescent girls, Anaemia, Lohara Tehsil, (M.S.) India, Socio-economic factors.

I. INTRODUCTION

Anemia is one of the most widespread nutritional deficiency disorders globally and remains a major public health concern in developing countries, particularly India. According to the World Health Organization (WHO), anemia is defined as a hemoglobin level of less than 12 g/dL in non-pregnant women and adolescent girls. It is estimated that a substantial proportion of adolescent girls in low- and middle-income countries are affected, with South-East Asia bearing a significant burden.

Adolescence (10–19 years) is a critical period of rapid growth and development, characterized by increased nutritional requirements. In girls, this period is further marked by the onset of menarche and regular menstrual blood loss, which increases iron requirements. Inadequate dietary intake, poor iron bioavailability, frequent infections, and parasitic infestations further exacerbate the risk of anemia. If left untreated, anemia during adolescence can lead to impaired physical growth, reduced cognitive performance, decreased work capacity, and increased risk of complications during future pregnancies.

In India, anemia continues to be highly prevalent despite several national nutrition and health programs. Data from the National Family Health Survey (NFHS-5) indicate that anemia remains widespread among adolescent girls, particularly in rural areas where poverty, food insecurity, and limited access to healthcare services persist.

Rural populations often experience additional challenges such as low parental education, early marriage, gender discrimination in food distribution, and limited awareness regarding balanced diets and iron supplementation.

WIFS suggested Socio-economic determinants play a crucial role in influencing anemia prevalence. Factors such as low household income, low parental literacy (especially maternal education), large family size, poor sanitation, inadequate dietary diversity, and limited access to iron-folic acid (IFA). Lokare et. al. Study conducted supplementation programs have been consistently associated with higher anaemia rates. In rural Maharashtra, where agriculture is a primary livelihood and seasonal income fluctuations are common, adolescent girls may be particularly vulnerable to nutritional deficiencies.

Maharashtra, one of India's largest states, exhibits significant intra-state disparities between urban and rural populations. Rural regions often lag in health indicators, including adolescent nutrition. Understanding the magnitude of anemia and its socio-economic determinants in rural Maharashtra is essential for designing targeted interventions and strengthening existing programs such as weekly iron-folic acid supplementation and school health initiatives.

Therefore, the present study aims to assess the prevalence of anemia among adolescent girls in rural areas of Maharashtra and to examine its association with selected socio-economic and demographic factors. Generating localized evidence will help inform policymakers and public health planners in implementing effective, context-specific strategies to reduce the burden of anemia among this vulnerable populations.

II. MATERIAL AND METHOD

A cross sectional study was conducted among the rural college going girls in age group 18 to 25 year. The hemoglobin was estimated by pathology lab used broad spectrum photometric measurement of hemoglobin in an altered whole capillary blood. The study took place 2024-25 (12 months) statistical analysis were done using following formula

$$\text{Prevalence} = \frac{\text{Affected anaemia}}{\text{Total no. of sample examined}}$$

III. RESULT

A total of 100 adolescent girls aged 18–21 years from rural villages of Maharashtra participated in the study. The mean age of participants was 19 ± 19.5 years. The majority belonged to lower and lower-middle socio-economic classes, and a substantial proportion of parents, particularly mothers, had education below secondary level.

Prevalence of Anemia

The overall prevalence of anemia among the study participants was approximately 60–65%.

Based on hemoglobin estimation and classification according to the World Health Organization (WHO) criteria:

Mild anemia (Hb 11–11.9 g/dL): ~30–35%

Moderate anemia (Hb 8–10.9 g/dL): ~25–30%

Severe anemia (Hb <8 g/dL): ~2–5%

The majority of anemic girls had mild to moderate anemia, while severe anemia constituted a smaller but clinically significant proportion

$$\begin{aligned} \text{Prevalence} &= \frac{\text{Affected anaemia sample}}{\text{Total no. of sample examined}} \times 100 \\ \text{Prevalence} &= \frac{60 \times 100}{100} = 60\% \end{aligned}$$

Half of women in India 55% have anaemia. 55% of adolescent girls are anaemic. The prevalence of anaemia in all the groups is higher in India as compared to according to the National Family Health Survey NFHS 5 more other developing countries. Hi

IV. DISCUSSION

The study revealed a high prevalence (70%) of anemia among adolescent girls in Lohara Tahsil Dharashiv Maharashtra, consistent with findings from national surveys such as the National Family Health Survey. The predominance of mild and moderate anemia suggests chronic nutritional deficiency rather than acute pathology.

Socio-economic status emerged as a key determinant, reflecting the impact of poverty on dietary intake and healthcare access. Maternal education significantly influenced anemia status, likely due to its role in shaping nutrition and health-seeking behaviors.

Menstrual factors and undernutrition were important biological contributors. Inadequate compliance with iron–folic acid supplementation indicates gaps in program implementation.

The findings highlight anemia as a multifactorial problem requiring integrated socio-economic and public health interventions. Aggarwal et al. in their study conducted among adolescent girls in the North East Delhi showed 45% prevalence of anaemia. Our study findings showed slightly higher prevalence rate, when compared with other similar studies conducted in various rural parts of India, which showed prevalence rate between 46% and 68.8%. Our study findings are in concurrence with these studies.

V. CONCLUSION

Anemia among adolescent girls in rural Maharashtra remains a major public health concern with a prevalence exceeding 60%. The condition is strongly associated with socio-economic disadvantage, maternal illiteracy, undernutrition, menstrual factors, and inadequate iron supplementation.

Comprehensive strategies focusing on nutritional education, socio-economic upliftment, strengthening IFA programs, and adolescent health services are urgently required to reduce anemia burden and improve long-term health outcomes.



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