



Study of Prevalence Iron Deficiency Anemia among Young Adults Age between 15-45 Years in Urban Area

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KEYWORDS

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ABSTRACT:

Iron deficiency anemia (IDA) remains a critical public health concern, particularly in urban areas where lifestyle and dietary factors contribute significantly to its prevalence. This study aims to assess the overall prevalence of iron deficiency anemia among individuals aged 15 to 45 in an urban setting, focusing on various age subgroups within this young adult population. By analyzing data from a representative sample of urban residents, the research identifies the distribution and frequency of IDA, examines demographic and socioeconomic factors influencing its prevalence, and highlights any significant variations across different age brackets within the 15-45 age range. The findings are expected to provide valuable insights into the burden of IDA in urban environments and inform targeted interventions and public health strategies to mitigate its impact. The study employs a combination of clinical assessments, laboratory tests, and demographic surveys to ensure a comprehensive evaluation of the condition. Preliminary results indicate a notable prevalence of IDA, with variations that underscore the need for tailored preventive measures and public health policies addressing the specific needs of different age groups within the urban population

Introduction

Iron deficiency anemia (IDA) is a significant public health issue in India, affecting a substantial proportion of the population across various age groups and socio-economic backgrounds. Characterized by insufficient iron levels to support optimal hemoglobin synthesis and red blood cell production, IDA leads to decreased oxygen transport to tissues, resulting in symptoms such as fatigue, weakness, and impaired cognitive and physical function (India Ministry of Health and Family Welfare, 2021).¹⁻²⁷

India bears a high burden of IDA due to a combination of factors, including dietary deficiencies, high rates of infectious diseases, and socio-economic challenges. The Indian diet is often low in bioavailable iron, particularly in vegetarian communities where reliance on plant-based iron sources—such as cereals and legumes—may not provide sufficient iron or be absorbed effectively (Reddy & Srinivasan, 2009). Furthermore, frequent infections and parasitic diseases, such as malaria and

hookworm infestation, exacerbate iron deficiency by causing blood loss and reducing iron absorption (Ghosh et al., 2013).¹⁻²⁷

The prevalence of IDA in India is alarmingly high, especially among vulnerable groups such as children, adolescent girls, and pregnant women. According to the National Family Health Survey (NFHS-5), over 60% of children under five years old and nearly 50% of pregnant women are affected by anemia (International Institute for Population Sciences, 2020). This widespread deficiency contributes to higher maternal and infant mortality rates, compromised cognitive development in children, and reduced work productivity in adults.¹⁻²⁷

Addressing IDA in India requires a multifaceted approach involving dietary interventions, supplementation programs, and public health policies. Government initiatives, such as the National Iron Plus Initiative (NIPI), aim to improve iron intake through supplementation and fortification of staple foods (India



Ministry of Health and Family Welfare, 2013). Additionally, educational campaigns to promote dietary diversity and better hygiene practices are essential for tackling this pervasive issue.¹⁻²⁷

MATERIAL AND METHODS:

Sample Size-

A study will be carried out on a random sample of 600 whole blood specimens, with 306 identified as having iron deficiency anemia. The 306 samples with iron deficiency anemia will be examined at the Hematology Laboratory of the School of Health Sciences, CSJMU Kanpur, and at GSVM Medical College, Kanpur.

Duration Of Study: The study was conducted over a period of 6 months.

Data/Sampling Collection And Storage-

The study included young adult males and females. Information on their age, occupation, and education was collected. A 2ml sample of peripheral venous blood was drawn from each participant using an appropriate venipuncture technique and placed in an EDTA anticoagulant tube for hematological analysis, which included a complete blood count, blood film, and reticulocyte count.

General Lab Equipment:

Summarizes the general laboratory equipment / instruments used in this study with the name of their manufacture and country of origin.

Sr. No	Instruments Device	or Manufactur ed By	Origin Contry
1.	Refrigerator	Samsang	INDIA
2.	Microscope	Olympus	JAPAN
3.	Micro Pipette	Erba	INDIA
4.	Glass Slides	PI Corporation	INDIA
5.	EDTA Vacutainer	BD Vacutainer	INDIA
6.	Horiba Micros 60	ABX Horiba	JAPAN

INVESTIGATION:

Complete Blood Count: The K2-EDTA blood samples were well mixed, and their red cell indices, including-

Hb, PCV, RBC, RDW, MCH, MCV, and MCHC, were measured using an Automated hematology analyzer (Horiba ABX Micros 60 – Japan). The analyzer was calibrated, and the samples were processed following the manufacturer's instructions

Reticulocyte Count

Reagent use for reticulocyte count: The 1% New Methylene Blue solution, pre-prepared by the manufacturer, contains 1% New Methylene Blue along with 0.72% sodium chloride and 0.6% sodium citrate.

Blood Film: Peripheral blood films were made using fresh blood and stained with Leishman stain to evaluate red cell morphology.

RESULT

The study assessed the severity and distribution of iron deficiency anemia (IDA) among participants. The severity of IDA was categorized into three levels:

Severe Anemia: 15 cases (5.0% of the total participants).

Moderate Anemia: 82 cases (26.7% of the total participants).

Mild Anemia: 209 cases (68.3% of the total participants).

Additionally, the study examined the prevalence of IDA across different age groups:

15-19 years: 34 patients, with a prevalence of 11.0%.

20-24 years: 49 patients, accounting for 16.0% prevalence.

25-29 years: 61 patients, representing 20.0% prevalence.

30-35 years: 73 patients, comprising 24.0% prevalence.

36-40 years: 46 patients, with 15.0% prevalence.

41-45 years: 43 patients, accounting for 14.0% prevalence.

The study also explored the prevalence of IDA based on occupation:

Students: 25.3% prevalence of IDA.

Employed individuals: 23.2% prevalence of IDA.



Unemployed individuals: 51.4% prevalence, which was the highest among all occupational groups.

These findings provide a comprehensive overview of both the severity and distribution of IDA across various age groups and occupations, highlighting significant differences in prevalence.

*Percentage of IDA in Different occupational-

Occupation	Iron deficiency Percentage
Students	25.3%
Employed	23.2%
Unemployed	51.4%

* IDA percentile in different age groups-

Age	Number of patient	Percentage
15-19	34	11.0%
20-24	49	16.0%
25-29	61	20.0%
30-35	73	24.0%
36-40	46	15.0%
41-45	43	14.0%

*Grading percentile of IDA

Type	Count of no.	Percentage
Severe anemic	15	5.0%
Moderate anemic	82	26.7%
Mild anemic	209	68.3%

Factor associated with anemia:

The final logistic regression model revealed that the prevalence of anemia was greater among unemployed individuals than among students and those who were employed.

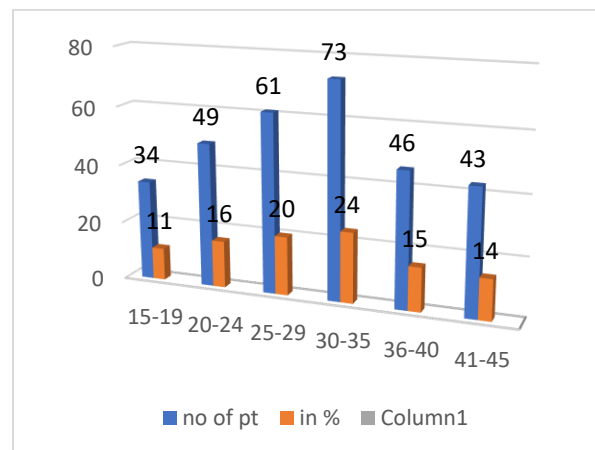
Discussion: The purpose of this study was to evaluate the prevalence of iron deficiency anemia among urban populations, with an overall prevalence rate of 51%. This underscores the significance of anemia as a major

public health concern in the region. The highest prevalence was recorded among the unemployed (51.4%), followed by students (25.3%) and employed individuals (23.2%). The study also classified the severity of iron deficiency anemia, finding 5.0% of cases to be severe, 26.7% moderate, and 68.3% mild. .

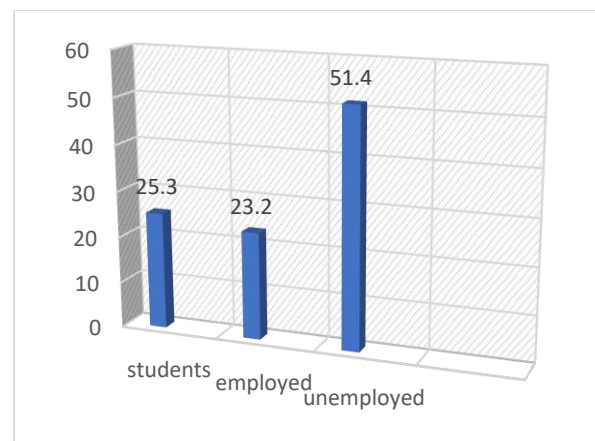
Conclusion: the elevated prevalence of iron deficiency anemia among young adults in this study points to a significant health issue that demands focused interventions to decrease its prevalence in this group. Enhancing nutritional health through counseling and education is essential. Factors like literacy, age, and employment have a considerable impact on anemia rates, while family socio-economic status is strongly associated with the occurrence of iron deficiency anemia.

Total IDA Count = 306

IDA according to Different age group.

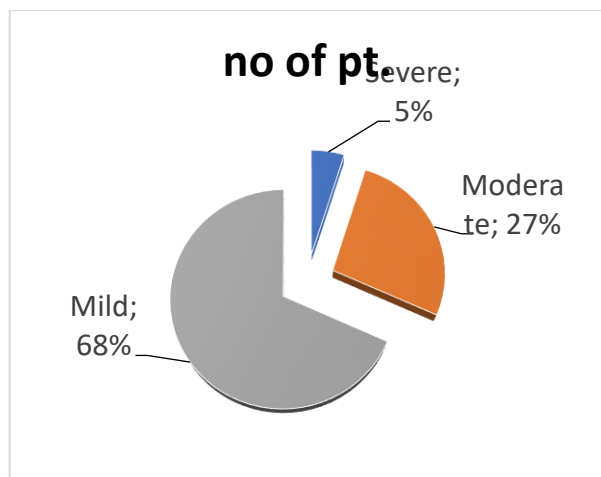


Percentage of IDA in Different occupational-





Grading count of IDA.



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