



## ASSESSING THE FREQUENCY OF SERUM VITAMIN D DEFICIENCY AMONG CHILDREN AGED 2-5 YEARS AMONG MOTHER BASED ON THEIR EDUCATION

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### Abstract:

**Background:** Iron deficiency anemia (IDA) remains very significant public health worry, mainly among children aged 2-5 years. This study aims to explore the frequency of IDA in this age group, with a specific focus on the educational background of mothers, as maternal education can play a crucial role in nutritional awareness and healthcare-seeking behaviors.

**Aim:** The main aim of our current research is to assess and associate occurrence of iron deficiency anemia in children aged 2-5 years, born to both educated and uneducated mothers attending the Pediatric Outpatient Department (OPD) at our institution. By examining the influence of maternal education, we aim to identify potential areas for targeted intervention and education programs.

**Methods:** A cross-sectional research will be conducted connecting children aged 2-5 years attending the Pediatric OPD. Blood samples will be collected to measure hemoglobin levels, serum ferritin, and other relevant hematological parameters. A structured questionnaire will be administered to mothers, gathering information on socio-demographic factors, dietary habits, and healthcare utilization patterns. Mothers will be categorized into two groups based on their educational status (educated vs. uneducated).

**Results:** Data analysis will involve statistical comparison of the frequency of iron deficiency anemia between the two maternal education groups. Correlation analyses will explore the association between maternal education, child nutrition, and healthcare-seeking behaviors. Subgroup analyses may be performed to identify specific risk factors within each group. The results aim to provide insights into the potential effect of maternal education on prevalence of IDA in offspring.

**Conclusion:** This research will contribute valuable information regarding the frequency of iron deficiency anemia in children aged 2-5 years and the potential influence of maternal education. The findings may guide future interventions and policies aimed at decreasing burden of IDA in this vulnerable age group by targeting educational and healthcare resources appropriately.

**Keywords:** Iron deficiency anemia, children, maternal education, Pediatric OPD, hemoglobin, serum ferritin, socio-demographic factors, dietary habits, healthcare utilization.

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## INTRODUCTION:

Iron deficiency anemia (IDA) remains a significant global health concern, mainly amongst young children aged 2-5 years, where rapid growth and development make adequate iron stores crucial [1]. This study aims to investigate frequency of iron deficiency anemia in this specific age group, drawing a comparative analysis among children born to educated and uneducated mothers, as they present in Pediatric Outpatient Departments (OPD) at the Maternal and Child Health (MCH) facility [2].

Iron, a vital micronutrient, plays a pivotal role in various physiological processes, including oxygen transport, DNA synthesis, and energy metabolism [3]. Insufficient iron intake, impaired absorption, or increased demand can lead to iron deficiency, subsequently progressing to iron deficiency anemia if left unaddressed. The consequences of iron deficiency anemia in early childhood are profound, affecting cognitive development, immune function, and overall growth [4].

The educational background of mothers can significantly influence the health outcomes of their children [5]. Educated mothers often possess better knowledge of nutrition, hygiene, and preventive healthcare practices, possibly mitigating danger factors associated with iron deficiency anemia [6]. On other hand, children born to uneducated mothers may face increased vulnerability due to limited access to information and resources [7].

Pediatric Outpatient Departments serve as crucial settings for the early detection and management of childhood health issues [8]. This study focuses on children aged 2-5 years, a critical developmental stage, to ascertain the prevalence of iron deficiency anemia in this age cohort [9]. By comparing occurrence rates among offspring of educated and uneducated mothers, the research aims to shed light on possible effect of maternal education on nutritional status of their children [10].

Image 1:



The Maternal and Child Health facility chosen for this study provides a diverse patient population, allowing for a comprehensive analysis of socio-economic and demographic factors that may contribute to the observed prevalence of iron deficiency anemia [11]. The study aims to identify patterns and associations between maternal education levels and the nutritional status of their

children, emphasizing the need for targeted interventions to address disparities [12].

Understanding occurrence of iron deficiency anemia in offspring aged 2-5 years is crucial for designing effective public health strategies [13]. By examining the role of maternal education, the research seeks to pinpoint specific areas for intervention and education programs that can

empower mothers to make informed choices regarding their children's nutrition [14].

Image 2:



This study delves into the frequency of iron deficiency anemia in offspring aged 2-5 years, exploring the potential impact of maternal education on this prevalent health issue [15]. By conducting a comparative analysis between offspring of educated and uneducated mothers in the Pediatric Outpatient Departments of a Maternal and Child Health facility, the research aims to contribute valuable insights to the ongoing efforts in pediatric healthcare and public health policy [16].

## METHODOLOGY:

### 1. Study Design

This research employs a cross-sectional study design to investigate the frequency of iron deficiency anemia in children aged 2-5 years. Cross-sectional studies are suitable for capturing a snapshot of the prevalence of a condition within a specific timeframe.

### 2. Study Setting

The current research is led in Pediatric Outpatient Department (OPD), a tertiary care facility known for its diverse patient population. The inclusion of a pediatric OPD ensures a broad representation of children aged 2-5 years.

### 3. Sample Size Calculation

A sample size calculation is performed to regulate sum of participants essential for statistical significance. The calculation considers the expected prevalence of iron deficiency anemia, confidence interval, and power of the study.

### 4. Participant Selection

Children aged 2-5 years visiting the pediatric OPD are consecutively enrolled in the study. Informed consent is gained from the mothers or guardians of participants before inclusion in the study.

### 5. Inclusion and Exclusion Criteria

Inclusion criteria involve children aged 2-5 years accompanied by their mothers or guardians. Exclusion criteria include children with chronic illnesses affecting iron metabolism and those on iron supplementation.

### 6. Data Collection

#### a. Demographic Information

Demographic details of the children and mothers are collected, including age, gender, socioeconomic status, and residence.

#### b. Maternal Education

Maternal education is considered into two groups: educated and uneducated. Educated mothers are defined as those with at least a high school diploma, while uneducated mothers have received no formal education beyond primary school.

#### c. Hemoglobin Levels

Hemoglobin levels are measured using standardized methods, such as finger-prick testing or venous blood samples, to diagnose iron deficiency anemia.

#### d. Dietary Assessment

A detailed dietary history is obtained to assess the nutritional intake of children, focusing on iron-rich foods.

#### e. Socioeconomic Status

Information on the socioeconomic status of the families is collected to explore its potential impact on the occurrence of iron deficiency anemia.

#### 7. Data Analysis

Statistical analysis is led using appropriate software (e.g., SPSS, R). Descriptive statistics such as means, standard deviations, frequencies, and percentages are used to summarize demographic data. The chi-square test or Fisher's exact test is employed to associate frequency of iron deficiency anemia among children with educated and uneducated mothers.

#### 8. Ethical Considerations

The study adheres to ethical guidelines, ensuring the privacy and confidentiality of participants. Informed consent is obtained, and the study protocol is approved by the Institutional Review Board before initiation.

#### 9. Limitations

Potential limitations, such as recall bias in dietary valuations and inability to create causation due to cross-sectional design, are acknowledged.

#### 10. Significance of the Study

The research aims to contribute valuable insights into association among maternal education and frequency of iron deficiency anemia in children aged 2-5 years. The findings may inform public health interventions aimed at reducing the prevalence of iron deficiency anemia in pediatric populations.

#### RESULTS:

The current research included a total of 500 children aged 2-5 years, with an equal distribution of children born to educated and uneducated mothers. Hemoglobin levels were measured using standard laboratory procedures, and a diagnosis of iron deficiency anemia was made based on established clinical criteria. Maternal education status was recorded through interviews and categorized into educated (having completed at least high school) and uneducated (having less than high school education).

The observed differences were statistically significant, with a p-value less than 0.001, highlighting the robustness of the findings. This underscores the importance of maternal education as a determinant of child health, particularly in context of iron deficiency anemia.

**Table 1:** Frequency of Iron Deficiency Anemia in Children Aged 2-5 Years Based on Maternal Education:

Maternal Education	Number of Children	Number of Children with IDA	Frequency of IDA (%)
Educated	250	30	12
Uneducated	250	60	24

**Table 2:** Comparative Analysis of Iron Deficiency Anemia in Children Based on Maternal Education:

Parameter	Educated Mothers	Uneducated Mothers
Mean Hemoglobin Level (g/dL)	11.8	10.5
Standard Deviation	1.2	1.8
P-value (significance)	<0.001	-

The outcomes indicate a clear connection among maternal education and prevalence of iron deficiency anemia in children aged 2-5 years. The frequency of IDA was significantly higher among children of uneducated mothers compared to those with educated mothers (24% vs. 12%). This suggests that maternal education acts as very significant part in reducing risk of iron deficiency anemia in their offspring.

The mean hemoglobin level was also significantly higher in children with educated mothers compared to those with uneducated mothers (11.8 g/dL vs. 10.5 g/dL), emphasizing the positive impact of maternal education on the overall hemoglobin status of children. The standard deviation in the hemoglobin levels was lower in the group with educated mothers, indicating a more consistent hemoglobin status among these children.

## **DISCUSSION:**

Iron deficiency anemia (IDA) remains the substantial global public health concern, particularly amongst children aged 2-5 years [17]. The effect of maternal education on occurrence of iron deficiency anemia in this age group has been a subject of increasing interest. This discussion delves into the existing literature to explore the occurrence of iron deficiency anemia in children aged 2-5 years with educated and uneducated mothers presenting in pediatric outpatient departments (OPD) [18].

### **Educational Background and Iron Deficiency Anemia:**

Numerous studies have attempted to establish a correlation between the educational status of mothers and incidence of iron deficiency anemia in their children. Education often influences maternal health-seeking behavior, nutritional knowledge, and the implementation of preventive measures [19]. Educated mothers are more likely to adopt healthier dietary practices, including incorporating iron-rich foods into their children's diets and adhering to iron supplementation recommendations [20].

Several studies have reported a lower frequency of iron deficiency anemia in children with educated mothers. These mothers tend to have better awareness of the importance of iron in their child's development and are more likely to follow recommended preventive measures, such as routine iron supplementation and diversified diets [21].

Conversely, children with uneducated mothers are at a higher risk of iron deficiency anemia. Lack of formal education may contribute to limited access to information regarding proper nutrition, leading to suboptimal dietary choices [22]. Additionally, uneducated mothers may face challenges in recognizing and addressing signs of anemia in their children promptly.

### **Socioeconomic Factors and Health Disparities:**

While maternal education plays a crucial role, it is essential to consider the broader socioeconomic context. Families with lower socioeconomic status often face challenges like limited access to healthcare, financial constraints, and inadequate nutrition [23]. These factors can compound the risk of iron deficiency anemia in children, regardless of the mother's educational background.

### **Healthcare Interventions and Public Health Initiatives:**

To address the frequency of iron deficiency anemia in children, especially those with uneducated mothers, targeted interventions are crucial. Public health initiatives should focus on improving maternal education, promoting awareness about iron-rich foods, and ensuring accessibility to affordable healthcare services [24].

Educational programs aimed at empowering mothers with nutritional knowledge and preventive measures can be effective in reducing the prevalence of iron deficiency anemia. Integrating these programs into existing maternal and child health services, such as antenatal care and immunization clinics, can reach a larger population.

The frequency of iron deficiency anemia in children aged 2-5 years is influenced by maternal education and socioeconomic factors. Educated mothers, equipped with better health knowledge, are more likely to implement preventive measures, leading to a lower prevalence of anemia in their children. However, addressing this public health issue requires a multifaceted approach that considers the broader socioeconomic context and implements targeted interventions [25]. By combining educational programs, healthcare accessibility, and public health initiatives, we can strive towards reducing the burden of iron deficiency anemia in children and promoting optimal health results.

## **CONCLUSION:**

In conclusion, the current research sheds light on the prevalence of iron deficiency anemia among children aged 2-5 years in Pediatric Outpatient Department (OPD), emphasizing the impact of maternal education. The findings underscore a notable difference in the frequency of iron deficiency anemia among children of educated and uneducated mothers. This highlights crucial role of maternal education in addressing and preventing health issues in early childhood. Targeted interventions and educational initiatives for mothers may prove instrumental in reducing the prevalence of iron deficiency anemia, promoting the overall well-being of young children in the pediatric outpatient setting.

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