

## Knowledge, Attitude, and Practices (KAP) Regarding Iron Deficiency Anaemia among Adolescent Girls in Rural Area

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### Abstract

Anaemia in adolescent girls is quit high. “National Family Health Survey (NFHS) reported that more than 50% of adolescent girls (aged 10-19 years) were anaemic in India (NFHS-3 and NFHS-4). Anaemia is defined as the condition in which the number and size of red blood cells (RBCs), or the haemoglobin (Hb) concentration, falls below an established cut-off value, consequently impairing the capacity of the blood to transport oxygen around the body and lacking to provide for a person's physiological needs (WHO, 2020).” The present study aimed to assess Knowledge, attitude, and practice (KAP) among anaemic school-going adolescent girls. A cross-sectional design and quantitative analysis were used in the study. The sample size was 100 respondents, and it was selected using the basic random sampling technique. The result shows that in the assessment of knowledge (58%) of the participants heard about anaemia and only (20%) of the participants know iron rich foods. Most of the girls recognize the importance of diet (82%), but misconceptions about the side effects of iron tablets (e.g., weight gain) were prevalent that was 65%. There were only 25% follow iron-rich dietary practices, and iron tablet adherence is low at 30%. Deworming coverage is very poor at just 10%, which may worsen iron absorption.

**Key world:** Anaemia, Attitude, Adolescent, Diet, Practice, Knowledge

### 1. Introduction

Iron Deficiency Anaemia (IDA) is a significant public health concern, particularly among adolescent girls in developing countries, including India. Whenever a person's red blood cell count and, thus, oxygen-carrying capability, are insufficient to meet all of the body's physiological needs which fluctuate depending on factors including age, gender, altitude, smoking, and stage of pregnancy they are said to have anaemia. In poor nations, dietary abnormalities and infections are the most common causes of anaemia, especially in the most vulnerable populations, such as pregnant women, teenage females, and preschool-aged children (Hafzan Y. et al., 2013). Adolescence, as defined by the World Health Organization (WHO), is the period between 10 and 19 years of age, a critical stage of growth and development marked by physical, psychological, and cognitive changes. During this phase, the body's demand for nutrients, especially iron, increases substantially to support rapid growth, the onset of menstruation, and increased physical activity.

India accounts for one of the highest burdens of anaemia globally, with adolescent girls being among the most vulnerable groups. “According to the National Family Health Survey-5 (NFHS-5), approximately 59.1% of girls aged 15–19 years in Rajasthan are anaemic. Iron deficiency is the most common cause, resulting primarily from inadequate dietary intake of iron, poor bioavailability of iron in vegetarian diets, frequent infections, and lack of awareness about anaemia and its consequences. Iron Deficiency Anaemia not only affects the immediate health and academic performance of adolescent girls but also has long-term implications. Anaemic girls are more likely to experience complications during pregnancy and childbirth later in life, perpetuating a vicious cycle of poor maternal and child health. IDA leads to reduced physical stamina, delayed cognitive development, and increased school absenteeism, thereby limiting the educational and economic potential of young girls.

Although the Government of India has launched various interventions such as the Weekly Iron and Folic Acid Supplementation (WIFS) programme and the Anaemia Mukh Bharat (AMB) strategy, the effectiveness of these

initiatives is often hindered by poor compliance, misconceptions about supplementation, and inadequate health education at the community and school levels.” Understanding the KAP of adolescent girls towards iron deficiency anaemia is crucial for designing effective, culturally relevant, and sustainable interventions. By evaluating their level of awareness, perceptions, and daily health practices, this study aims to identify existing gaps and recommend actionable steps to reduce the burden of IDA in school-going girls. This research specifically focuses on adolescent girls studying in government and private schools in urban and semi-urban areas of Rajasthan. It assesses their knowledge of IDA symptoms and causes, their attitudes toward iron-rich diets and supplementation, and their actual dietary and hygiene practices. The findings from this study will provide valuable insights for educators, public health planners, and policymakers striving to promote adolescent health and break the intergenerational cycle of malnutrition and anaemia. A study by Toteja et al. (2006) reported that over 50% of adolescent girls in India are anaemic, with a higher prevalence in rural areas. According to NFHS-5 (2020-21), about 59.1% of teenage girls aged 15–19 years in Rajasthan are anaemic. Various studies (Kaur et al., 2015; Patil et al., 2018) have shown that low awareness about iron-rich foods, poor dietary habits, and misconceptions about iron supplementation are key contributors to high prevalence. Cultural food taboos, irregular intake of iron supplements, and a lack of nutrition education in schools further exacerbate the issue.

## 2. Method and materials

Research methodology is an organized approach to problem-solving. In any study, research methodology is a standard set of methods/procedures for analysing an issue from all angles, together with the justifications for each. This chapter describes the tools and techniques that are performed to gather and organize the data for investigation. It comprises the report of the research design, locale, sample, sampling method, tools and techniques, and the data analysis plan.

- **Study Design:**

The present study used a cross-sectional descriptive research design. Pre tested structured questionnaire were used to assess the socio-demographic profile and KAP regarding iron deficiency anaemia.

- **Sample Size:**

The study consisted of 100 adolescent girls aged 12–18 years. They were selected from the selected schools for the study. The research was conducted in government schools, which were randomly selected for data collection.

- **Sampling Technique:**

A simple random sampling was used for the data collection in the present research.

- **Data Collection Tool:**

A semi-structured questionnaire was used, consisting of four sections which is mention below;

1. Socio-demographic data
2. Knowledge about IDA (causes, symptoms, prevention)
3. Attitudes towards iron supplementation and diet
4. Practices regarding iron intake, deworming, and dietary habits

### **Inclusion Criteria:**

- Adolescent girls enrolled in grades 8–12
- Provided informed consent

### **Exclusion Criteria:**

- Girls with chronic illnesses
- Refusal to participate

### 3. Results

The data collected from the schools and sample size was 100 adolescent girls. Data were analysed using SPSS 20 and Microsoft Excel. The results are categorized under three main components: Knowledge, Attitude, and Practice (KAP) regarding Iron Deficiency Anaemia (IDA). Descriptive statistics (frequencies and percentages) were used.

**Table.1. Socio-Demographic Profile of the participants (n=100)**

| Variable              | Category           | Frequency | Percentage (%) |
|-----------------------|--------------------|-----------|----------------|
| <b>Age (years)</b>    | <b>Group</b> 12–15 | 42        | 42%            |
|                       | 16–17              | 38        | 38%            |
|                       | 18–19              | 20        | 20%            |
| <b>Type of School</b> | Government         | 100       | 100%           |
| <b>Residence</b>      | rural              | 100       | 100%           |

As indicated by the frequency distribution table of the participants' characteristics above in table 1, 42 respondents (42%), the majority of whom were between the ages of 12 and 15, all attended government schools (100%), and the majority of respondents lived in rural areas.

**Table.2. Awareness of Knowledge about Iron Deficiency Anaemia**

| Q.no. | Knowledge                                      | Correct (%) |
|-------|------------------------------------------------|-------------|
| 1.    | Heard of anaemia                               | 58%         |
| 2.    | Knows iron is important for blood              | 42%         |
| 3.    | Knows symptoms (fatigue, pale skin, dizziness) | 35%         |
| 4.    | Knows iron-rich foods (e.g., spinach, jaggery) | 20%         |
| 5.    | Knows causes (poor diet, menstruation)         | 25%         |
| 6.    | Knows prevention (diet + supplements)          | 30%         |

Based on the percentage distribution of knowledge of the participants show in table 2 as mentioned above, 58% of the respondents have heard about anaemia, 42% participants know iron is important for blood, 35%

knows about symptoms, 20% knows about iron rich foods, 25% knows the cause of anaemia, and 30% knows about the prevention of anaemia. Only about 1/3 of girls could correctly identify symptoms, and just 20% were aware of iron-rich foods, indicating low overall knowledge.

**Table.3. Assessment of attitude towards Iron Supplementation and Diet**

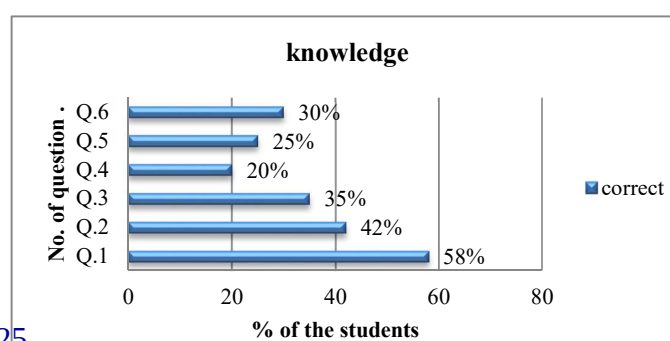
| Statement                                              | Agree (%) | Neutral (%) | Disagree (%) |
|--------------------------------------------------------|-----------|-------------|--------------|
| Iron tablets are necessary for adolescent girls        | 48%       | 30%         | 22%          |
| Iron supplements have side effects (e.g., weight gain) | 65%       | 15%         | 20%          |
| Eating green vegetables is important                   | 82%       | 10%         | 8%           |
| I would take iron tablets if properly explained        | 45%       | 28%         | 27%          |

Table 3 shows that the attitude of the participants towards the awareness of iron tablets and iron supplements. Most of the girls recognize the importance of diet (82%), but misconceptions about the side effects of iron tablets (e.g., weight gain) were prevalent that was 65%.

**Table.4. Assessment of practice regarding Iron Intake and Anaemia Prevention**

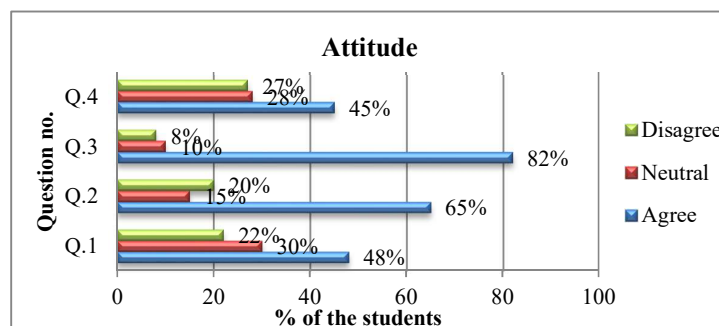
| Practice                                           | Yes (%) | No (%) |
|----------------------------------------------------|---------|--------|
| Consume green leafy vegetables $\geq 3$ times/week | 25%     | 75%    |
| Regularly take school-distributed iron tablets     | 30%     | 70%    |
| Had deworming in the last 6 months                 | 10%     | 90%    |
| Skip meals frequently                              | 40%     | 60%    |

Based on the table 4 as mentioned above, there were only 25% follow iron-rich dietary practices, and iron tablet adherence is low at 30%. Deworming coverage is very poor at just 10%, which may worsen iron absorption.



**Figure1: Awareness of knowledge about Iron Deficiency Anaemia**

Figure 1 showing percentages of the knowledge questions which was mentioned in table 2: symptoms, causes, foods, prevention, and general awareness. 20% of participants were very less knowledge about iron rich food products and 58% was higher knowledge about anaemia.

**Figure 2: Assessment of attitude towards Iron Supplementation and Diet**

A figure 2, showing that 65% of the participants believe iron tablets cause side effects and 82% participants knows that eating green leafy vegetables is important to cure anaemia.

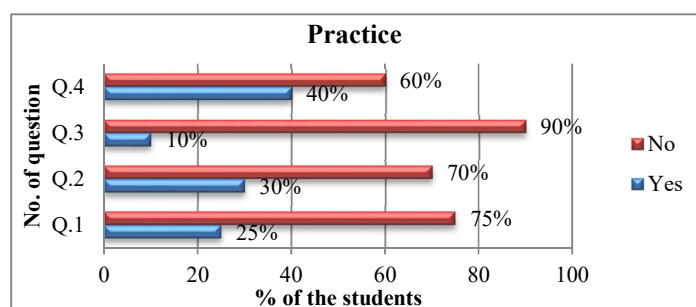
**Figure 3: Practices Affecting Iron Intake of the participants**

Figure 3, showing that 10% of the participants had deworming in the last 6 months and 90% participants was not having any kind of deworming tables or iron tables.

### 3. Discussion

The result showed that KAP of the participants was not as good as much, even 58% do not hear about anaemia and 90% of the participants were not taking any type of medication of iron or deworming tablets since last 6 months. As mentioned above in the tables and figures they showed that vary less percentages of the participants were aware about anaemia. In this study adolescent girls had positive dietary behaviour 25%. “Anaemia is directly affected by daily consumption of foods that contain less iron. If the food nutritional value, then the nutritional status is also good, conversely if the food consumed is lacking in nutritional value, it will causes malnutrition and can cause anaemia (Hapzah & Ramlah, 2012). Several factors influence knowledge if seen from the characteristics of respondents, namely the age of most respondents aged 12-15 years (42%), age can affect someone in terms of thinking mindset develops so that the knowledge gained gets better (Notoadmodji, 2007).

Sufficient knowledge does necessarily affect a person’s attitude and behaviour in food selection and consumption of iron tablets especially in adolescent age groups girls. Factors of information obtained from electronic media can also influence adolescent’s knowledge. Lack of knowledge can increase the risk of the adolescent girls affected by anaemia, especially girls during menstruation who should consume additional iron intake (Martini, 2015). More than half of the participants (58%) had heard of anaemia, but only a small fraction demonstrated accurate knowledge about its symptoms (35%), iron-rich foods (20%), or its connection to menstruation and poor diet (25%). This indicates a major knowledge gap, especially in rural and semi-urban populations. In terms of attitude, while many girls acknowledge the importance of a healthy diet (82% agree on

green vegetables), misconceptions persist especially the belief that iron tablets cause undesirable side effects such as weight gain (65%). These misconceptions directly affect compliance with iron supplementation programs, contributing to poor health outcomes. The practice patterns observed were equally concerning. Only 25% regularly consumed iron-rich foods, and just 30% took iron tablets consistently. Alarming, 90% of girls had not undergone deworming in the past six months—an essential intervention that supports iron absorption and prevents reinfection. These figures suggest that awareness does not always translate into positive practices, especially when access, motivation, or guidance is lacking.

#### 4. Conclusion

This study reveals significant gaps in knowledge and poor practices regarding IDA among adolescent girls in Rajasthan, despite a moderately positive attitude. The findings highlight the urgent need for reinforced school-based health education, regular deworming, improved WIFS implementation, and parental involvement to combat iron deficiency anaemia. This study reveals important insights into the knowledge, attitude, and practices (KAP) of adolescent girls in Rajasthan regarding Iron Deficiency Anaemia (IDA). Despite the availability of public health programs like Weekly Iron and Folic Acid Supplementation (WIFS) and Anaemia Mukht Bharat (AMB), a significant proportion of school-going adolescent girls remain unaware of anaemia's causes, symptoms, and prevention methods. Importantly, the study found a clear link between better knowledge and improved practices. Girls with higher awareness levels were significantly more likely to follow recommended behaviours, such as taking iron supplements or eating iron-rich foods.” This finding underlines the critical role of education and counselling in preventing anaemia. Addressing Iron Deficiency Anaemia among adolescent girls requires a multi-pronged approach combining health education, behavioural change, nutritional support, and consistent public health interventions. Empowering adolescent girls with the right knowledge and supportive environments is key to breaking the cycle of anaemia and ensuring a healthier future generation.

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