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A Cross-Sectional Study to Assess The Awareness and Practice Regarding Iron Deficiency Anemia and its Prevention Among Adolescent Girls of Selected Schools of Bardoli

Mayuri Rabari[1] , Rani Shetty,[2]

[1]Ph.D Scholar Maniba Bhula Nursing College, Uka Tarsadiya University, Bardoli, Surat, Gujarat
.[2]Principal and Dean Maniba Bhula Nursing College, Uka Tarsadiya University, Bardoli, Surat, Gujarat

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ABSTRACT

Introduction: Anemia is a state in which the concentration of hemoglobin or the number of red blood cells is less than normal. The purpose of the study was to assess the awareness and practices regarding Iron deficiency anemia and its prevention among school-going adolescent girls, and to establish a correlation between the mean score of awareness and practice.

Methodology: A cross-sectional survey was conducted among 237 adolescent girls who attend school. The sample was selected using a non-probability consecutive sampling technique. Data were collected through a structured questionnaire that included 14 demographic questions, 20 questions assessing knowledge, and a checklist with 20 practice-related questions. The data were analyzed using statistical and inferential methods

Result: The study results indicated that the level of awareness was good among 13.09% of the samples, while it was poor in 20.67% of the samples. In terms of practice, 4.7% of the samples demonstrated good practice, and 17.7% showed poor practice. Additionally, there was a positive correlation between awareness and practice, with a correlation coefficient of r = 0.936.

Conclusion: The study found that the participants had an average level of awareness and understanding of iron deficiency anemia and its prevention. It is recommended that community health nurses provide education to adolescents about iron deficiency anemia and the measures necessary to prevent it.

Key words: Awareness, Practice, Iron deficiency anemia, Prevention

Corresponding Author: Mayuri Rabari, Ph.D Scholar, Maniba Bhula Nursing College, Maliba Campus, Gopal Vidhyanagar, Uka Tarsadiya University, Bardoli, Mahuva Road, Tarsadi, District: Surat, Gujarat 394350.

E-mail: mayuri.rabari@utu.ac.in

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INTRODUCTION

Anemia is a condition characterized by a lower-than-normal concentration of hemoglobin or a reduced number of red blood cells in the body. Hemoglobin is essential for transporting oxygen to tissues. When there is insufficient hemoglobin or when red blood cells are abnormal, the blood's ability to carry oxygen diminishes, leading to symptoms such as weakness, fatigue, dizziness, and shortness of breath, among others.

The physiological requirements for hemoglobin vary based on factors such as age, gender, altitude, pregnancy status, and smoking habits. Meeting these physiological needs requires maintaining optimal hemoglobin levels.

Globally, anemia is a significant public health issue, particularly affecting young children, menstruating adolescent girls, women, and pregnant or postpartum women. According to WHO estimates, 40% of children aged 6–59 months, 37% of pregnant women, and 30% of women aged 15–49 years worldwide are anemic. In 2019, anemia resulted in the loss of 50 million years of healthy life due to disability[1].

India is home to 253 million adolescents aged 10 to 19, making it one of the largest adolescent populations in the world. However, there is limited nationally representative nutrition survey data available for this age group. The National Family Health Surveys (NFHS) only cover adolescents aged 15 to 19 and provide limited nutrition indicators. Between 2005 and 2006 and 2019–2021, NFHS data indicate a slight increase in anemia prevalence among Indian adolescents aged 15 to 19: for girls, it rose from 55.8% to 59.1%, and for boys, it increased from (30.2%0 to (31.1%)[9].

Iron is an essential micronutrient that plays a crucial role in many functions within the human body. It is necessary for oxygen binding, immune function, cellular growth and differentiation, enzymatic reactions, as well as the transport and storage of various substances. Additionally, iron supports mental and physical development and cognitive function. A deficiency of iron, whether due to pathological (disease-related) or physiological (body-related) factors, can negatively impact both physical and mental growth, leading to reduced productivity and learning capacity. Iron Deficiency Anaemia is characterized by a disruption in hemoglobin synthesis, resulting in microcytic (small) and hypochromic (pale) red blood cells. This condition can occur due to blood loss, increased demand for iron for any reason, or insufficient nutritional intake[2].

Iron deficiency anemia in adolescent girls can arise from several factors. These include insufficient intake or absorption of iron, heavy menstrual blood loss, parasitic infections, and the increased nutritional needs that come with adolescence. Notably, over 50% of the world's underweight population resides in India[3]. While iron deficiency anemia can affect individuals of all ages and genders, adolescent girls are particularly vulnerable. According to the World Health Organization (WHO), adolescence is defined as the age range from 10 to 19 years(4), and it is reported that three-quarters of adolescents do not meet their dietary iron requirements[5].

In adolescents, anemia is associated with various physical disorders, stunted growth, and cognitive impairments. It also increases reproductive health risks among adolescent girls as they transition into womanhood[6]. Iron deficiency, which leads to anemia, can impair mental development and physical growth, reduce physical fitness, lower academic performance, decrease work capacity, and weaken resistance to infections[7]. Additionally, once adolescent girls with anemia become pregnant, they face increased risks of maternal mortality and morbidity. This condition is linked to a higher likelihood of premature delivery, perinatal mortality, and low birth weight. Furthermore, infants born to anemic mothers are at a significant risk of developing anemia within the first six months of life[8].

According to UNICEF, anemia in India affects 40% of girls and 18% of boys[10]. Data from the National Family Health Survey-3 (NFHS-3) indicates that the prevalence of anemia among adolescent girls is 56%. The Global Burden of Disease Study conducted in 2021 reported that the global prevalence of anemia across all age groups is 24.3%[11]. Iron deficiency is a preventable cause of anemia, and the daily iron requirement for an adolescent girl is 0.8 mg per 1000 kcal of dietary energy[12]. The Indian government has set a goal to reduce the burden of anemia in girls and women by 50% as part of the 12th Five-Year Plan.

A study conducted to identify the prevalence of anemia among 200 adolescent girls found that 50% were anemic. Among these, 43.3% had mild anemia, while 3.3% were classified as having moderate to severe anemia[13]. Various studies have reported anemia prevalence rates ranging from 24.3% to over 60%.

Adolescence is a unique opportunity for intervention, as individuals in this age group are more receptive to lifestyle changes that can influence their future. Previous studies have indicated that adolescents often lack adequate knowledge, positive attitudes, and healthy practices regarding malnutrition and dietary intake. By educating them about iron deficiency, we can help prevent anemia and its long-term consequences. Enhancing health education interventions to improve knowledge, attitudes, and practices among adolescents is crucial for reducing anemia and mitigating both short-term and long-term health issues, as well as those affecting their future offspring. However, there is a lack of information regarding the evaluation of study characteristics and the overall quality of evidence from intervention studies aimed at improving these factors among adolescents, particularly in the Asia region[14].

During community outreach efforts, it was observed that adolescent girls had limited knowledge about the prevention of anemia. To address this issue, a study was conducted to assess their awareness and practices regarding iron deficiency anemia and its prevention. The study also aimed to analyze the correlation between the mean scores of awareness and practices among school-going adolescent girls.

Materials and Methods

A cross-sectional survey design was employed to collect data from adolescent school-going students between July 21, 2023, and July 27, 2023. Permissions were obtained from the Institutional Ethical Committee (ref no: MBNC/103/2023-24), the Medical Officer of the Primary Health Center in Sarbhon, and the Principals of the selected schools. A total of 237 adolescent girls who were willing to participate and proficient in Gujarati, Hindi, and English were recruited using a consecutive sampling technique.

The data collection tool comprised 14 demographic questions, 20 knowledge questions (allocated as follows: 30% for general knowledge, 10% for comprehension, 25% for application, 15% for analysis, 5% for synthesis, and 15% for evaluation), and 20 practice questions (checklist). Self-reported techniques were utilized for data collection. The content validity of the tool was established by seven experts, and the reliability was assessed using the coefficient of correlation ($r = 0.78$) for the knowledge questionnaire and Cronbach's alpha ($r = 0.77$) for the checklist.

Data analysis included calculating the mean, standard deviation, range, and median for knowledge using SPSS version 22.0 (IBM SPSS Statistics). The Karl Pearson test was used to determine the correlation between the mean scores of awareness and practice regarding iron deficiency anemia and its prevention.

Result

Findings of demographic variables

In terms of demographic findings, the majority of participants (53%) were in the 14-15 age

group. Most respondents (29%) were studying in the 9th or 10th standard. A significant portion (76%) lived in joint families, while 24% resided in nuclear families. Regarding income, the highest percentage (34%) fell into the low-income category (earning less than Rs. 2,640), whereas only 4% reported a good income (more than Rs. 52,734).

In terms of social categories, 57% of participants identified as belonging to the Scheduled Tribe (ST) category, while 12% belonged to the Scheduled Caste (SC) category. Dietary habits showed that 44% of the samples were vegetarian, and 28% were non-vegetarian.

When it came to sources of information, 40% of participants obtained information from friends and relatives, while only 10% used newspapers and magazines as sources. Regarding menarche the majority (92%) experienced regular cycles, while 8% reported irregular cycles. Most participants (59%) attained menarche at around 13-14 years of age, while 5% reported early menarche at ages 9-10.

Table1: Identification of the level of awareness and practice regarding iron deficiency anemia and its prevention.

N = 237

Level	Awareness		Practice	
	Frequency	**Percentage**	**Frequency**	Percentage
Good	31	13.09 %	11	4.7%
Average	157	66.24 %	184	77.6%
Poor	49	20.67 %	42	17.7%

Awareness: As shown in Table 1, the majority (66.24%) of adolescents demonstrated an average level of awareness.

Practice: Regarding practices, a significant proportion (77.6%) of adolescents exhibited an average level of practice.

Table 2: displays the range, mean, standard deviation, and median of awareness and practices related to iron deficiency anemia and its prevention.

N = 237

	Range	Mean	SD	Median
Awareness	1-16	9.07	3.05	9
Practice	2-15	8.74	2.17	9

The data presented in Table 2 indicates that the mean score for knowledge was 9.07, with a standard deviation (SD) of 3.05 and a median score of 9. In contrast, the mean score for practice was 8.74, with an SD of 2.17 and a median score of 9.

Table 3: shows the correlation between the mean scores of awareness and practice regarding iron deficiency anemia and its prevention.

Variables	Mean score	SD	R value	P value
Awareness	9.07	3.05	0.936	0.05
Practice	8.74	2.17		

As shown in Table 3, the correlation between the mean scores of awareness and practice was 0.936, with a p-value of 0.05. This indicates a moderately positive correlation between awareness and practice. A moderately positive correlation suggests that higher levels of awareness are associated with better practices[15].

DISCUSSION

The findings of the study regarding awareness and practices related to iron deficiency anemia indicate that 66.24% of participants had average

awareness, while 13.09% had good awareness. Additionally, 77.6% exhibited average practices concerning iron deficiency anemia, whereas 17.7% displayed poor practices in this regard.

These results align with a study conducted at an Ayurveda Tertiary Care Hospital and nearby schools in Delhi, India, which found that approximately 42.5% of adolescent girls knew about iron deficiency anemia. The findings are also supported by research conducted by Imunticha Francis Tashara, Reeshma Kunjamma Achen, Rency Quadras, and colleagues at Manipal College of Nursing, Manipal University, Karnataka, India[16]. Furthermore, a study by Sapna Kumari and Isha Dharni revealed similar results[17]. In terms of attitude and practice, it was noted that most girls were not engaging in healthy behaviors. Many adolescent girls had a habit of consuming outside food, which likely contributes to the prevalence of anemia and its associated consequences[18].

LIMITATION

The study is limited to a one-time interaction with adolescents. The study was conducted in a selected school in Bardoli taluka.

CONCLUSION

Based on the study's findings, it was concluded that the participants had an average level of awareness and understanding of iron deficiency anemia and its prevention. To improve both awareness and practices, interventional measures such as nutritional supplementation, counseling, and education are necessary. Community health nurses should focus on educating individuals, providing counseling, and offering nutritional supplements. They can also demonstrate how to prepare iron-rich meals. Additionally, the government's initiatives to reduce iron deficiency anemia should be incorporated into health education programs.

Conflict of interest

There was no conflict of interest reported.

Source of funding

This study was self-funded.

Ethical Clearance

Permission was obtained from the Taluka Health Officer (Ref No: MBNC/102/2023-24) in Bardoli, Surat, Gujarat. The researcher secured assent from school-going adolescent girls who met the inclusion criteria. Additionally, the researcher received clearance from the ethical committee of Maniba Bhula Nursing College on May 16, 2023, with reference number MBNC/025/2023-24.

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