

Knowledge and practice regarding the prevention of Iron Deficiency Anemia among Pregnant Women at 250 Bedded Mohammad Ali Hospital, Bogura, Bangladesh

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Abstract

Background: Iron deficiency anemia of pregnancy is a reduction of the concentration level of circulating hemoglobin below normal that occurs during pregnancy due to iron deficiency in a woman's body [12]. Pregnancy is a period of significant increase in iron requirement; the demand for iron is higher a result of numerous maternal adaptations like increase in number of red blood cell and higher needs for iron by developing and growing organs, placenta and fetus[7]. Iron Deficiency Anemia (IDA) among pregnant have a potential to cause cognitive decline, increased prevalence of underweight children and higher early neonatal and infant mortality⁹. A study concluded by Paula stated that tea consumption should be avoided by pregnant women as it has adverse effect on fetus outcom². **Objective:**The aim was to assess the level of knowledge and practice regarding the prevention of iron deficiency anemia among pregnant women at 250Bedded Mohammad Ali Hospital, Bogura, Bangladesh. **Methodology:** This was a descriptive cross sectional study design was used and sample size 120 that was purposive sampling technique followed those who meet the inclusion criteria and to assess the knowledge and practice regarding the prevention of iron deficiency anemia among pregnant women. The study was conducted from December, 2024 to May, 2025. The instruments for data collection were a structure and semi-structured questionnaire which composed of two parts: Demographic variables and knowledge and practice-based information on prevention of iron deficiency anemia among pregnant women. **Results:** The findings of the present study revealed that the 10% were high level of knowledge, 60% were moderate level of knowledge and 30% were low level of knowledge regarding the of iron deficiency anemia and the 10% were high level of practice, 20% were moderate level of practice and 70% were low level of practice. Similarly, the findings of another study in Palestine revealed that a good knowledge level regarding IDA was 22.7% and Pakistan 41.5% of IDA. India, had similar results, revealing that their participant's knowledge ranged from average 64%⁶. **Conclusion:** In conclusion, our study provides a detailed examination of the knowledge and practices related to Iron Deficiency Anemia (IDA) among pregnant women. Targeted health education campaigns, coupled with improvements in antenatal care, can play a pivotal role in mitigating the risks associated with iron deficiency anemia. The findings of the present study revealed that the 60% were moderate level of knowledge and 70% were low level of practice regarding the iron deficiency anemia. This study serves as a call to action for healthcare providers, policymakers, and communities to collaboratively work towards comprehensive health initiatives.

Keywords: Knowledge, practice, iron deficiency anemia and prevention.

I. INTRODUCTION

Iron deficiency anemia (IDA) during pregnancy is a very common problem. It remains a major contributing factor to maternal morbidity and mortality. Anemia is a global public health problem affecting both developing and developed countries with major consequences for human health as well as social and economic development. It occurs at all stages of the life cycle, but is more prevalent in pregnant women and young

children. In 2002, iron deficiency anemia (IDA) was considered to be among the most important contributing factors to the global burden of disease [1]. According to World Health Organization anemia in pregnancy is defined as a hemoglobin concentration below 11g/dl Iron-deficiency [2]. Anemia is a deficiency in the number or quality of red blood cells in human body. Red blood cells carry oxygen around body using a particular protein called hemoglobin. Anemia means that either the level of red blood cells or the level of hemoglobin is lower than normal [3]. Anemia is the lack of functioning red blood cells (RBCs) that lead to a decreased in that ability to carry oxygen causing complications during life time. Anemia is the most common form of malnutrition in the world and is the eighth leading cause of disease in girls and pregnant women in developing countries. The World Health Organization (WHO) estimates showed in 2011, 32.4 million (38%) of pregnant women, while 496 million (29%) of those who are not pregnant between the ages of 15-49 years suffer from anemia [4]. Moreover, previous studies on IDA have revealed a prevalence of 73.9% in Guyana, 22.1% in Egypt, 39.7% in Kuwait, 78.0% in Liberia, and 50.0% in Bahrain [5]. Iron needs increased exponentially during pregnancy to meet the increased demands of the fetoplacental unit, to expand maternal erythrocyte mass, and to compensate for iron loss at delivery in more than 80% of countries in the world, the prevalence of anemia in >20% and could be considered a major public health problem. The global prevalence of anemia in pregnancy is estimated to be approximately 41.8% [6]. Pregnancy is a period of significant increase in iron requirement; the demand for iron is higher a result of numerous maternal adaptations like increase in number of red blood cell and higher needs for iron by developing and growing organs, placenta and fetus [7]. Iron is needed in significant amount to support maternal and fetal growth. Despite increased iron requirements, pregnancy is also a period of increased risk for anemia which is higher than in non-pregnant state [8]. Iron Deficiency Anemia (IDA) among pregnant women have a potential to cause cognitive decline, increased prevalence of underweight children and higher early neonatal and infant mortality [9]. The aim of the study was to assess the level of knowledge and practice regarding the prevention of iron deficiency anemia among pregnant women at 250 Bed Mohammad Ali Hospital, Bogura.

II. METHODOLOGY & MATERIALS

A descriptive cross-sectional study was conducted to assess the knowledge and practice regarding the prevention of iron deficiency anemia among pregnant women. The study was carried out at the antenatal care (ANC) unit of the Gynaecology and Obstetrics Department of the 250-Bedded Mohammad Ali Hospital, Bogura, Bangladesh. Data collection was conducted between December 2024 and May 2025. A total of 120 pregnant women were selected for this study. The sample size was calculated using a standard statistical formula.

Inclusion Criteria:

- Pregnant women of all trimesters attending the antenatal care (ANC) unit.
- Women aged 15–45 years.
- Women who are mentally and physically stable and able to respond to interview questions.

Exclusion Criteria:

- Pregnant women who are seriously ill, hospitalized in critical care, or unable to respond at the time of data collection.
- Women with known psychiatric illness or cognitive impairment that could affect their responses.
- Women who have severe pregnancy complications (e.g., preeclampsia, severe anemia requiring transfusion) during the data collection period.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethical Committee of Bogura Nursing College, Bogura. Written permission was also obtained from the Principal of Bogura Nursing College, the hospital authority, and the Nursing Superintendent of the 250-Bedded Mohammad Ali Hospital. Written informed consent was obtained from all participants after explaining the objectives of the study. Participation was voluntary, and confidentiality and anonymity were strictly maintained. No personal identifiers were collected, and respondents were informed of their right to withdraw from the study at any stage without penalty.

Data Collection

Data were collected using a structured, interviewer-administered questionnaire developed by the researchers, which comprised two sections: Part A focused on socio-demographic information, and Part B addressed knowledge and practice related to the prevention of iron deficiency anemia. Data collection was conducted through face-to-face interviews using the semi-structured questionnaire over six days, during both morning and evening sessions. The questionnaire included items on socio-demographic characteristics such as

age, education, occupation, residence, family type, and dietary pattern. It also covered aspects of knowledge about anemia, including its definition, causes, risk factors, complications, and preventive measures. In addition, questions were asked regarding practices related to diet, supplement intake, and avoidance of substances that inhibit iron absorption. Perceptions about the benefits of iron supplementation for maternal and fetal health were also collected.

Knowledge and Practice Assessment Criteria

Knowledge and practice levels were assessed using a set of ten multiple-choice questions. The scores were categorized into three levels: high, moderate, and low. A high level of knowledge or practice was defined as a score between 80–100%, a moderate level as a score between 60-79%, and a low level as a score of less than 59%. The same scoring criteria were applied consistently for both knowledge and practice assessments.

Statistical Analysis

Collected data were checked for completeness, coded, and entered manually, then analyzed using descriptive statistics (frequency, percentage) with the assistance of a scientific calculator. The results were organized in tabular and graphical formats.

III. RESULT

Table 1 presented the demographic characteristics of the study population (n=120). The majority of participants were aged 15–25 years (59.17%). More than half of the respondents resided in urban areas (55.00%), while 45.0% lived in rural areas. Almost all participants were married (95.00%). In terms of education, 53.33% had secondary-level education. Most participants were unemployed (85.00%). Half of the respondents lived in joint families (50.00%), and the other half in nuclear families (50.00%). A large proportion followed a non-vegetarian diet (85.83%). When asked about their understanding of anemia, the majority (67.50%) correctly identified it as low hemoglobin, 17.50% related it to iron deficiency, 11.67% to poor nutrition, while 3.33% admitted not knowing. Most participants (81.67%) reported having prior knowledge of iron deficiency anemia. Regarding risk factors, 60.00% cited low dietary iron intake, 28.33% mentioned heavy menstrual bleeding, 8.33% identified history of infections or blood diseases, and 3.33% cited digestive disorders. Concerning non-nutritional causes, intestinal worm infestation was the most frequently reported (46.67%), followed by genetic disorders (25.00%), cancer (18.33%), and digestive problems (10.00%) (Table 2). Half of the participants (50.0%) identified preterm labor as the most common complication, while 20.0% cited heart failure, 16.67% developmental delays in children, and 13.33% weakened immunity. Preventive measures were most often reported as consuming iron-rich foods (71.67%), followed by blood transfusion for managing blood loss (21.67%), avoiding coffee/tea with meals (5.0%), and avoiding iron blockers with meals (1.67%). Regarding dietary strategies, 65.0% emphasized red meat, fish, and fortified rice (Table 3). Figure 1 illustrated perceptions regarding the benefits of iron supplementation. More than half of the participants (53.33%) believed supplementation prevents adverse maternal and newborn outcomes, 21.67% emphasized increasing antenatal IFA coverage, 18.33% recognized it as the most cost-effective intervention, while 6.67% associated it with improving infants' linear growth. A majority of participants showed moderate knowledge (60.0%) with corresponding moderate practice (20.0%), while 30.0% had low knowledge and 70.0% demonstrated poor practice (Table 4). Harmful practices such as extra fast-food consumption were reported by 71.67% of participants, drinking fizzy beverages with meals by 32.50%, and pica by 20.83%. Tea and coffee consumption immediately after meals were practiced by 18.33% and 13.33%, respectively. Positive practices included recognition of vitamin C for better iron absorption (38.33%) and awareness of iron-rich foods like red meat and green leafy vegetables (28.33%) (Table 5).

Table 1: Demographic characteristics of the study population (n=120)

Variables	Frequency (n)	Percentage (%)
Age (years)		
15-25	71	59.17
26-35	44	36.67
36-45	5	4.17
Living area		
Rural	54	45.00
Urban	66	55.00
Marital status		
Married	114	95.00
Divorced	6	5.00
Widowed	0	0.00
Educational status		
Primary	17	14.17
Secondary	64	53.33

Higher secondary and above	39	32.50
Employment status		
Labor	2	1.67
Government	4	3.33
Private	12	10.00
Unemployed	102	85.00
Type of family		
Joint	60	50.00
Nuclear	60	50.00
Diet pattern		
Non-vegetarian	103	85.83
Vegetarian	17	14.17

Table 2: Distribution of participants by knowledge of anemia (n=120)

Variables	Frequency (n)	Percentage (%)
What do you understand by anemia?		
Poor nutrition	14	11.67
Iron deficiency	21	17.50
Low hemoglobin	81	67.50
I don't know	4	3.33
Do you have any knowledge about iron deficiency anemia?		
Yes	98	81.67
No	22	18.33
Do you know the risk factors for iron deficiency anemia?		
Low dietary iron intake	72	60.00
Heavy menstrual bleeding	34	28.33
Digestive disorders like celiac disease	4	3.33
History of Infections or Blood Diseases	10	8.33
What is the most common non-nutritional causes of iron deficiency anemia?		
Presence of intestinal worm	56	46.67
Cancer	22	18.33
Genetic disorder	30	25.00
Digestive system problems like ulcer, colon polyps	12	10.00

Table 3: Distribution of participants by knowledge of complications and preventive measures (n=120)

Variables	Frequency (n)	Percentage (%)
What is the most common complication of iron deficiency anemia?		
Weakened immune system	16	13.33
Heart failure	24	20.00
Developmental delays in children	20	16.67
Preterm labor	60	50.00
What is the preventive measures for iron deficiency anemia?		
Eat Iron-Rich Foods	86	71.67
Avoid iron blockers with iron-rich meals	2	1.67
Avoid coffee and tea with meals	6	5.00
Managing blood loss by transfusion	26	21.67
Which meal plan can help reduce iron deficiency anemia?		
Focus on incorporating readily available local foods	4	3.33
Leafy green vegetables	18	15.00
Red meat, fish, and fortified rice	78	65.00
Sources of vitamin C like tomatoes, oranges and lemon	20	16.67

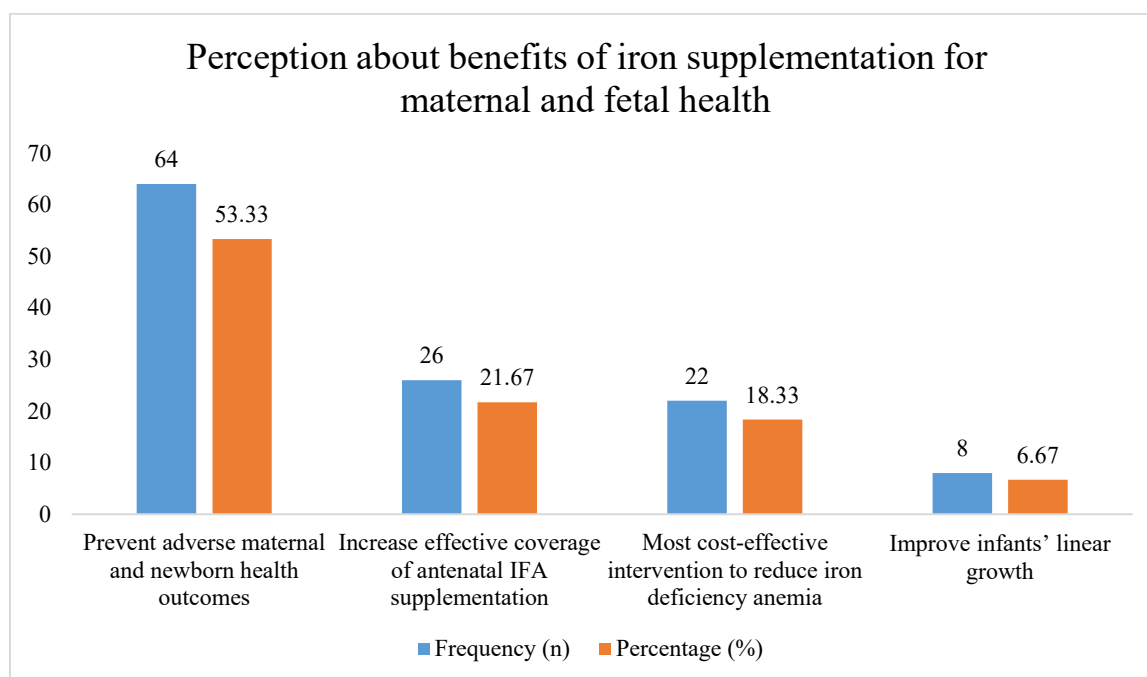


Figure 1: Perception among patients regarding benefits of iron supplement for mother and fetus health (n=120)

Table 4: Categorization of knowledge and practice levels regarding iron deficiency anemia prevention

Variables	Level of knowledge		Level of practice	
	n	%	n	%
High	1	10.00	1	10.00
Moderate	6	60.00	2	20.00
Low	3	30.00	7	70.00
Total	10	100.00	10	100.00

Table 5: Distribution of practice by yes, no and don't know (n=120)

Variables	Yes		No		Don't know	
	n	%	n	%	n	%
Drinking directly tea after meals	22	18.33	78	65.00	20	16.67
Fizzy beverage with meals	39	32.50	50	41.67	31	25.83
Taking calcium (dairy product) with meat and liver	40	33.33	55	45.83	25	20.83
pica (which a person craves eating nonfoods items such as the soil-ice-clay)	25	20.83	64	53.33	31	25.83
Extra eating fast food	86	71.67	30	25.00	4	3.33
Drinking coffee directly after meals	16	13.33	51	42.50	53	44.17
Need to seek medical attention if you suspect symptoms of anemia	38	31.67	47	39.17	35	29.17
Taking Vitamin C helps in iron absorption	46	38.33	55	45.83	19	15.83
Red meat, green leafy vegetables, beans, and nuts are great sources of iron	34	28.33	62	51.67	24	20.00
Anemia can be inherited or it may be caused by nutrient deficiency among other factors	38	31.67	55	45.83	27	22.50

IV. DISCUSSION

Iron deficiency anemia (IDA) is a major public health concern among pregnant women, contributing significantly to maternal and neonatal morbidity and mortality worldwide. In developing countries like Bangladesh, limited awareness and inadequate preventive practices exacerbate the burden of this condition. Assessing knowledge and practices related to IDA prevention is crucial to improving maternal health outcomes. This study focused on pregnant women attending the 250 Bedded Mohammad Ali Hospital in Bogura. In this study, population was predominantly young: 59.17% were 15–25 years and only 4.17% were older than 35 years. Most participants were married (95.0%), slightly more lived in urban areas (55.0%), and the modal educational level was secondary schooling (53.33%). The vast majority were not formally employed (85.0%), half lived in joint families and half in nuclear families, and 85.83% reported a non-vegetarian diet. These sociodemographic characteristics mirror patterns seen in facility-based antenatal samples in Bangladesh where

antenatal clinic attendees are often younger women with secondary education and large proportions are homemakers. Facility samples frequently over-represent urban or care-seeking women compared with community surveys, which should be kept in mind when interpreting generalizability [10]. Most participants (67.5%) understood anemia as “low hemoglobin,” while 17.5% recognized it as “iron deficiency” and only 11.67% mentioned “poor nutrition.” Awareness about iron deficiency anemia was high, as 81.67% reported having some knowledge. Regarding risk factors, 60.0% identified low dietary iron intake, followed by heavy menstrual bleeding (28.33%) and history of infections or blood diseases (8.33%), while very few mentioned digestive disorders (3.33%). Non-nutritional causes were also recognized, with 46.67% identifying intestinal worm infestation, 25.0% genetic disorders, and 18.33% cancer. These findings are consistent with studies from other Asian country, which reported limited knowledge of specific risk factors before educational interventions [11]. In terms of complications, half of the women (50.0%) correctly reported preterm labor as a consequence of IDA, followed by heart failure (20.0%) and developmental delays in children (16.67%). Preventive measures were better recognized, with 71.67% identifying the importance of eating iron-rich foods, though only 5.0% mentioned avoiding tea and coffee with meals, and 1.67% recognized avoiding iron blockers. Dietary planning knowledge was also limited; while 65.0% acknowledged red meat, fish, and fortified rice as helpful, fewer recognized leafy green vegetables (15.0%) or vitamin C sources (16.67%). Concerning perceptions, 53.33% believed iron supplements help prevent adverse maternal and newborn outcomes, and 21.67% recognized them as an effective antenatal intervention. These results align with findings from India, where participants demonstrated good awareness of dietary prevention but poor knowledge of absorption inhibitors [12]. Sanin et al emphasized that although dietary awareness is widespread, knowledge of enhancing absorption (e.g., vitamin C co-consumption) and avoiding inhibitors remains poor [13]. This is also consistent with a study in Bangladesh that commonly report moderate awareness of anemia but gaps in specific knowledge about causes, consequences and the role of supplementation [14]. This pattern—reasonable recognition of diet as preventive but poor knowledge on absorption inhibitors and behavioural steps to improve iron uptake—is a frequent finding in survey and is important because knowledge of how to enhance absorption (e.g., vitamin C co-consumption, timing of tea/coffee) predicts better dietary practice and IFA adherence [15]. In our study, 10.0% of respondents demonstrated a high level of knowledge, 60.0% had a moderate level, and 30.0% had a low level. Similar trends were observed in India, where Jyoti and Chatterjee (2021) reported that most nursing students demonstrated only average to good knowledge (64% average, 36% good) regarding IDA [12]. The present study revealed a large gap between knowledge and practice. Only 10.0% of participants had high-level practices, 20.0% moderate, and 70.0% low. While 38.33% recognized the importance of vitamin C in enhancing iron absorption, a substantial proportion engaged in poor practices such as frequent fast-food consumption (71.67%) and drinking tea or coffee with meals (18.33% and 13.33%, respectively). Furthermore, only 31.67% acknowledged the importance of seeking medical attention when anemia symptoms appeared. These findings are in line with previous study, reporting that despite adequate knowledge about anemia, practice and adherence to preventive measures remain poor due to cultural habits, side effects of supplements, and lack of consistent counselling [13]. Prior studies in Bangladesh show good coverage but variable adherence to IFA supplementation (many women receive some tablets but few complete the full recommended course), and behavioural barriers such as poor counselling, side-effects and poor knowledge about timing and dietary interactions contribute to non-adherence [16]. Globally, weak translation of knowledge into practice is a common challenge, as demonstrated by Ayub et al [11].

Limitations of the study:

1. Data were self-reported, raising the possibility of recall bias and social desirability bias.
2. The cross-sectional design limited the ability to establish causal relationships between knowledge and practices.
3. The use of descriptive statistics without inferential analysis restricted deeper exploration of associations between socio-demographic factors and knowledge/practice levels.

V. CONCLUSION AND RECOMMENDATIONS

In conclusion, our study provides a detailed examination of the knowledge and practices related to Iron Deficiency Anemia (IDA) among pregnant women. Targeted health education campaigns, coupled with improvements in antenatal care, can play a pivotal role in mitigating the risks associated with iron deficiency anemia. Anemia is one of the global public health problems, both for developing and developed countries, affecting women of different age groups. The findings of the present study revealed that the 60% were moderate level of knowledge and 70% were low level of practice regarding the iron deficiency anemia. This study serves as a call to action for healthcare providers, policymakers, and communities to collaboratively work towards comprehensive health initiatives.

Recommendations:

1. The study can be replicated on the large sample to validate and generalize the findings.
2. The study can be conducted on different settings like national level.
3. The level of pregnant women's knowledge only was assessed.
4. A comparative study can be conducted to assess knowledge and practices regarding the prevention of iron deficiency anemia among pregnant women at 250 Bedded Mohammad Ali Hospital, Bogura.
5. There is need to improve better knowledge and positive practice to the prevention of iron deficiency anemia among pregnant women. This can be achieved by providing educational and motivational activities and improvement in nursing services which are needed to promote the health and prevention of iron deficiency anemia and its consequences.
6. A similar study can be under taken on large scale.

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