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Original article

Pregnant women's knowledge, attitude and practice regarding the prevention of iron deficiency anemia among Ethiopian pregnant women

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Abstract

Background: Despite the fact that there are various methods for the treatment and prevention of maternal anemia, there are still many pregnant women affected by anemia-related health problems and contributing factors. The aim of the study was to assess the knowledge, attitude, and practice of pregnant women with regard to the prevention of iron deficiency anemia (IDA) in public hospitals of Harar, Eastern Ethiopia.

Methods: This cross-sectional study was done on 128 pregnant women, who referred to public hospitals in Harar, Eastern Ethiopia for antenatal care. Sample selection was based on random sampling. The anemia status of the pregnant women was determined by measuring their hemoglobin and ferritin serum levels. The data was collected using a close-ended, semi-structured questionnaire.

Results: According to the results, 68% of the participants had no IDA. Most of them had heard about anemia and defined it. The majority of them knew the causes and the preventive methods (58.6%). Most of them had a positive perception of the consumption of folic acid, family planning, feeding on regular meals. Most of them (59.4%) took folic acid during pregnancy, and 56.3% fed on fiber-rich food.

Conclusion: This study found that around one-third of the pregnant women had IDA. So it is vital to promote health education, involve private health institutions and husbands. Health facilities and stakeholders should, therefore, work on increasing the awareness, positive perception and skill necessary for the prevention of IDA.

Keywords: Anemia, Pregnancy, Developing countries, Hemoglobin

Introduction

It is generally assumed that a balanced amount of nutrients in food is necessary for all human beings for proper body system functions. This indicates that nutrition is a fundamental pillar for human beings, for the health and development of entire life (1). Nowadays, malnutrition is the great problem in both developed and developing countries. It is worth noting that obesity and chronic non-communicable diseases are major problems in developed countries. In developing countries, on the other hand, widespread under-nutrition and micronutrient deficiencies are common (2).

It is believed that during pregnancy, it is necessary to have a proper balanced diet to ensure sufficient energy intake for adequate growth of fetus without drawing on mother's own tissues to maintain her pregnancy (3). Pregnancy is also a period of a significant increase in iron requirement; the demand is higher due to physiological changes in maternal red blood cell mass and also due to the needs for the development and growth of the placenta and fetus. Despite increased iron requirements, pregnancy is also

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a period of increased risk for anemia, which is higher than that of non-pregnant state (4-6).

According to WHO, the definition of anemia is "a condition in which the number of red blood cells (RBCs) or their oxygen-carrying capacity is inadequate to meet the physiologic demands in the body, in which the hemoglobin level may vary by age, sex, altitude, smoking, and pregnancy status". Anemia in pregnancy is identified by the WHO as hemoglobin (Hb) level less than 11g/dl and is divided into three levels in terms of severity: Mild anemia (Hb level, 9 -10.9g/dl), Moderate anemia (Hb level, 7-8.9g/dl), and Severe anemia (Hb level 7-4.5 g/dl) (7).

In sub-Saharan Africa, there are multiple causes of anemia in pregnancy, which include inadequate diet, iron folate and vitamin B12 deficiencies, impaired micronutrient absorption, blood loss resulting from hemorrhage, and helminthes infestation (8). In Ethiopia, 27% of women are undernourished with a body mass index (BMI) of less than the 18.5 cutoff point, and only 4% are obese with a BMI of more than 25.0. The major problems are protein-energy malnutrition and micronutrient deficiencies such as vitamin A, iron, and iodine. These figures put Ethiopia among sub-Saharan countries with the highest proportion of malnourished women. (9). Anemia affects over two billion people globally, among whom over 40 million are pregnant women. Iron deficiency is thought to be the most common cause of anemia, and it accounts for 75%-95% of cases (10). Research findings indicate that anemia affects 57% of pregnant women globally with the highest prevalence in sub-Saharan Africa (11).

Anemia is thought to be an indicator of nutritional deficiencies, which can significantly contribute to birth defects, preterm labor, and low birth weight, which can, as a result, cause a global public health problem. However, iron deficiency anemia (IDA) is a leading cause of maternal morbidity and mortality, prenatal and prenatal infant loss; physical and cognitive losses can stall social and economic development in developing countries. In sub-Saharan countries, the magnitude of anemia in pregnancy is quite alarming, whereby its prevalence is widely contributed by poor nutrition, iron and other micronutrients deficiencies, parasitic infestations, chronic infections, illiteracy, and short pregnancy intervals (12). Women with IDA may be asymptomatic: however, they are more susceptible to infection, may tire easily, are prone to an increased chance of preeclampsia and postpartum hemorrhage, and can poorly tolerate, even a minimal blood loss during birth. The healing of an episiotomy or an incision is usually delayed, and if the anemia is severe, cardiac failure may ensue. Furthermore, there is evidence of increased risk of low birth weight. In addition, IDA is associated with a higher incidence of low-birth weight infant's preterm birth, pre-maturity, stillbirth, and neonatal death in infants of women with severe iron deficiency (13).

The prevalence of anemia in Ethiopian women of 15-49 age group is 17%. It is 27.9% in Southeast Ethiopia (38) Lack of awareness is the major retarding factor to reach millennium development goal, as the awareness of anemia among pregnant women is only 72%. Anemia was found to be a severe public health problem in Ethiopia. More than 40% of pregnant women are anemic (14).

It is estimated that iron deficiency and other micronutrients are the main causes of anemia throughout the world. It is more common among women of reproductive age. These deficiencies may lead to birth defects, preterm labor, low birth weight, resulting in an increase in prenatal death (15). Many women suffer from a combination of chronic energy deficiency, poor weight gain in pregnancy, anemia, and other micronutrient deficiencies, as well as infections like HIV and malaria. These, along with inadequate obstetric care, can contribute to high rates of maternal mortality and poor birth outcomes (16).

Despite the fact that anemia has been identified as a global public health problem for several years, no rapid progress has been observed, and that the prevalence of the disease is still high globally (17). Although there are various intervention methods for the treatment and prevention of maternal anemia, there are still many pregnant women affected by anemia-related health problems, and the contributing factors for the persistence of high incidences are not empirically known (18). It is, therefore, vital to devise a method for the reduction and control of anemia in women (5). Thus, the aim of this study was to assess the current status of anemia and assess the knowledge, attitude, and the practice of prevention of IDM among pregnant women who came to public hospitals in Hagar for ante-natal care (ANC) and follow up. This study was also able to identify the knowledge, attitude,

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and practice of pregnant women on how to prevent the nutritional anemia in Harar. It also showed how far the problem exited, and what measurements should be taken to curb it. Also, different health institutions including health centers were used as a baseline data to work on such a gap related to their institutional capacity and care.

Materials & Methods

This cross-sectional study was carried out from March to April, 2018. It included 128 pregnant women who attended public hospitals of Harar, Eastern Ethiopia, for antenatal care (ANC). The sample size was determined through a single proportion formula. It was computed based on the three objectives: knowledge, attitude and practice. With regard to the fact that the average monthly flowing of pregnant women in both hospitals of our study was 186, we finally adjusted the sample size to be 128.

The participants were selected out of the eligible pregnant women, aged at least 18 years, who referred to the hospital for ANC and had no evidence of chronic diseases, bleeding disorders, and placental previa. Anaemia status was undertaken routinely by measuring their Hb levels at the first visit (1st), and was repeated at 28th week of gestation. Anemia was identified if Hg level was less than 11 mg/dl in the 1st, and 3rd trimester, or less than 10.5 mg/dL in the 2nd trimester of pregnancy. In addition, serum feritin was assessed routinely in participants with diagnosed anemia. Iron deficiency anemia was identified in pregnant women with low Hb and low serum ferritin (less than 30 mg/L).

The data were collected through a local-language questionnaire. The questionnaire included socio-demographic, knowledge, attitude, and practice-related issues, all in local language, on how to prevent IDA in pregnant women. The data were collected with the help of 4 clinical nurses, supervised by a BSc clinical nurse. Before the data collection, the data collectors and the supervisor were trained for 1 day. The questionnaire was adopted form different studies. In order to confirm the ethical and legal standards, an approval was obtained from the ethical board of Harar Health Science College. The survey commenced after written informed consent forms were obtained from Jugal and Hiwot fana specialized University Hospitals and the participants.

Results

The participants were approximately 18-27 years of age and married. Around one-fifth (21.9%) of the participants had primary education. The majority of the participants 59(46.1%) were working in governmental institutions. Approximately 46% of the participants reported that they had >2500 birr monthly income, and that 82.8%) of the participants lived in urban area (Table 1).

Table 1. Socio-demographic and reproductive characteristics of the participants

Variables	Frequency	Percentage
Age (years)		
18 - 22	38	29.7
23 - 27	39	30.5
28 – 32	33	25.7
>33	18	14.1
Marital status		
Single	21	16.4
Married	107	83.6
Educational level		
Primary school	28	21.9
Secondary school	50	39.1
Diploma & above	50	39.1
Employment status		
Farmer	13	10.2
Governmental worker	59	46.1
Private workers	34	26.6
House wife	22	17.2
Number of family		
2	78	60.9
3	43	33.6
>3	7	5.5
Family income (birr/ month)		
1000-1500	27	21.1
1500-2500	42	32.8
>2500	59	46.1
Residence status		
Urban	106	82.8
Rural	22	17.2
Age at first marriage		
16-20	65	50.8
21-25	33	25.8
26-30	26	20.3
>30	4	3.1
Age of 1st pregnancy		
18-22	65	50.8
23-27	41	32
>27	22	16.4
Number of pregnancy		
1	66	51.6
2	42	32.8
3	18	14.1
4	2	1.6
Years of child spacing		
<3 Years	51	39.8
3-4 Years	11	8.6
No have child before	66	51.6

Out of the total 128 participants who were asked for their knowledge of iron deficiency anemia, the

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majority 113 (88.3%) reported that they had heard about IDA, and 15 (11.7%) claimed that they had not heard about IDA at all.

Table 2. Knowledge of the pregnant women regarding prevention of iron deficiency anemia

Variables	Frequency	Percentage
Have heard about iron deficiency anemia?		
Yes	113	88.3
No	15	11.7
Source of information 1st		
Health care worker	71	55.5
Radio	16	12.5
Printed materials	12	9.4
Others	14	10.9
Not heard	15	11.7
What is anemia?		
Poor nutrition	33	25.8
Iron deficiency	40	31.3
Low hemoglobin	7	5.5
I don't know	48	37.5
Sign & symptom of anemia		
shortness of breathing	14	10.9
Exceptional fatigue	12	9.4
General body weakness	18	14.1
Poor appetite	15	11.7
Dizziness or fainting	18	14.1
All can be observed	3	2.3
I don't know	48	37.5
Cause of anemia		
Poor nutrition	45	35.2
Bleeding during pregnancy	26	20.3
Multiple pregnancy & spacing	3	2.3
All listed above	6	4.7
I don't know	48	37.5
Do you know how to prevent anemia?		
Yes	75	58.6
No	53	41.4
How can we prevent anemia?		
By good nutrition	40	31.3
Using Iron supplement	25	19.5
Drinking or Eating fruits	7	5.5
All listed above	3	2.3
I don't know	53	41.4
Do you know drinking tea, coffee & milk can reduce iron absorption in the body?		
Yes	39	30.5
No	89	69.5
Do You know spacing child can prevent anemia?		
Yes	78	60.9
No	50	39.1
Which one is best spacing of child to prevent anemia?		
<2 years	10	7.8
≥	68	53.1
I don't know	50	39.1

For the definition of anemia, 40(31.3%), 33(25.8%), and 7 (5.5%) defined anemia as iron deficiency, poor nutrition, low hemoglobin, respectively, and 48(37.5%) did not know the definition appropriately. As for the cause of anemia, the majority 45 (35.2%) cited poor nutrition as the cause for anemia, but 48(37.5%) did not know the cause for anemia at all. As far as knowledge for the prevention of anemia is concerned, the majority 75(58.6%) knew how anemia could be prevented (Table 2).

Table 3. Attitude of the pregnant women regarding prevention of iron deficiency anemia

Variables	Frequency	Percentage
Do you believe that regular visit use to health of mother & fetus during pregnancy?		
Strongly disagree	5	3.9
Disagree	1	.8
Agree	53	41.4
Strongly agree	52	40.6
I don't know	17	13.3
Iron supplement can affect mother & fetus health?		
Strongly disagree	1	.8
Agree	45	35.2
Strongly agree	35	27.3
I don't know	47	36.7
Drinking coffee, tea or milk can affect iron absorption		
Disagree	10	7.8
Agree	37	28.9
Strongly agree	11	8.6
I don't know	70	54.7
Iron supplement or iron tablets can prevent anemia		
Strongly disagree	3	2.3
Disagree	2	1.6
Agree	50	39.1
Strongly agree	21	16.4
I don't know	52	40.6
Regular meals or feeding can prevent anemia		
Strongly disagree	1	.8
Disagree	2	1.6
Agree	64	50.0
Strongly agree	13	10.2
I don't know	48	37.5
Pregnant women should consume Iron tablets in spite of healthy diet		
Strongly disagree	4	3.1
Disagree	10	7.8
Agree	46	35.9
Strongly agree	15	11.7
I don't know	53	41.4
Promotion of family planning methods for spacing with prevent anemia		
Strongly disagree	1	.8
Disagree	2	1.6
Agree	60	46.9
Strongly agree	11	8.6
I don't know	54	42.2
Spacing child can prevent anemia		
Strongly disagree	8	6.3
Disagree		
Agree	54	42.2
Strongly agree	15	11.7
I don't know	51	39.8
Any pregnant women can be affected by anemia		
Strongly disagree	4	3.1
Disagree	9	7.0
Agree	53	41.4
Strongly agree	13	10.2
I don't know	49	38.3

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Regarding the attitude of participants, the majority 52(40.6%) and 53(41.4%) agreed and strongly agreed that regular visits had benefits for both the mother and the fetus during pregnancy. With regard to the effect of iron supplement on the mother and fetus, 45(35.2%) and 35(27.3%) agreed and strongly agreed, but 47(36.7%) did not know about the benefits. Around 70(54.7%) did not know that drinking tea, coffee and milk could reduce iron absorption. Also, 37(28.9%), 11(8.6%), 10(7.8%) agreed, strongly agreed, and disagreed that iron supplements or iron tablets could prevent anemia. 50(39.1%) and 21(16.4%) of the participants agreed and strongly agreed, but 52(40.6%) did not know that iron supplements or tablets could prevent anemia.

With regard to feeding and regular meals to prevent anemia, the majority 64(50%) agreed. With regard to the fact, that pregnant women should consume Iron tablets in spite of healthy diet, 46(35.9%) and 15(11.7%) agreed and strongly agreed. Regarding the role of family planning in prevention of anemia, the majority 60(46.9%) agreed, and 49(38.3%) did not know the link between pregnancy and anemia. Thirty-two percent of pregnant women had ID (Table 3).

Table 4. Practice of the pregnant women regarding prevention of iron deficiency anemia

Variables	Frequency	Percentage
Have you drink tea, coffee & milk with meal?		
Yes	60	46.9
No	68	53.1
Have you used regular iron Tablets?		
Yes	41	32.0
No	87	68.0
Have you use three regular meals?		
Yes	76	59.4
No	52	40.6
Have you taken Folic acid supplements in current pregnancy?		
Yes	76	59.4
No	52	40.6
Do you have the habit of Eating red meat, liver, chicken, fish		
Yes	62	48.4
No	66	51.6
Do you include fiber rich food frequently?		
Yes	72	56.3
No	56	43.8
Do you include green leafy vegetable in your diet every day?		
Yes	75	58.6
No	53	41.4
I iron deficiency anemia (IDA)		
Yes	41	32
No	87	68

Regarding the lifestyle of the participants, the majority 68(53.1%) did not drink tea, coffee and milk with their meals, but 60(46.9%) practiced it on a daily basis. With regard to the use of regular iron tablet, 87(68%) reported that they did not take them at all, but 41(32%) mentioned taking them. The majority 76(59.4%) reported having 3 regular meals, and the remaining 52(40.6%) mentioned not having 3 regular meals every day. With regard to taking Folic acid supplements during pregnancy, the majority 76(59.4%) were using them, but 52(40.6%) did not use the supplements at all. In addition, 62(48.4%), 72(56.3%) & 75(58.6%) had the habit of eating red meat, liver, chicken, fish, eggs, legumes, fruits, and fiber rich food frequently, and included green leafy vegetable in their diet every day (Table 4).

Discussion

In our study, the prevalence of IDA was 32%, which was less than those of the studies conducted in Azerbaijan, Kazakhstan, Uzbekistan, Kyrgyz, Egypt, Jordan, but it was higher than those in Armenia and Moldova. This could be due to the differences in sample size and study area.

In a study conducted in Nabulus, Palestine, a higher prevalence rate of IDA was found among city inhabitance, 35 out of 137 (25.5%). Younger age group (≤ 24) in the study seemed to show the highest prevalence. Similarly, the city inhabitants in our study had a higher prevalence, which could be due to the fact that city inhabitants are more exposed to these types of diseases.

In another study in Palestine N=171, the majority of participants (53%) correctly identified preventive and treatment options for anemia. Examples of these preventive measures were eating nutritionally-sufficient diets and protein rich foods. The intake of iron supplements and multivitamins was also considered as a preventive measure. It is worth mentioning that this was higher in our study, due to sample size differences.

A study conducted in Tanzania showed that the respondents with secondary or higher levels of education (38%) had a higher level of knowledge and awareness on anemia. Sixty-one percent of participants provided erroneous information about the prevention

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and treatment of anemia, but a few participants did not know how to prevent or treat it.

According to a study done on Sierra Leone in 2012, 99% of participants had heard about anemia, and the majority of participants indicated that they could get information about anemia from medical settings. This is less in our study, which may be due to the difference in information dissemination and study area

In another similar study on 185 subjects in Sierra Leone, the majority (89.2%) had heard about anemia. This is consistent with the result of our study in which the majority of participants (68.1%) recognized lack of iron in food as the cause for anemia. About 69.7 percent pointed out that consuming iron rich foods could prevent anemia, which is less than that of our study, but most of them (53%) did not know about the food items that inhibited iron absorption. This was high in our study, which could be due to the differences in study area as well as sample size.

In addition, High level of knowledge was reported by IDA group of participants in Palestine. With regard to the definition of anemia, 64.7%, 67.6%, and 88.2% of participants were able to link anemia with poor nutrition, iron deficiency and low Hb levels, respectively: nonetheless, in our study, there was a link, but it was lower than that of Palestine, which could be due to sample size and awareness on IDA.

Knowledge concerning symptoms associated with IDA was also found to be at high level. This is evident from the findings of 88.9%, 84.5%, 93.3%, 75.6% and 80% of the participants who reported that IDA was associated with such symptoms as fatigue, general weakness, dizziness and fainting, headaches, and pallor of face, lips and nail beds. In the case of our study, the participants knew all signs and symptoms of IDA.

According to the results of our study, most of the participants knew shortness of breath, weakness, poor appetite, dizziness, and fainting as symptoms of anemia. That is similar to the results of a study done in Palestine. The minor differences in frequencies and percentages could be due to sample size.

In another study in Palestine in 2007, a highly positive attitude was found with respect to the daily use of iron supplements during pregnancy as recommended by the specialists. This is clear from the findings of the IDA group, who approved the use of iron supplements. Likewise, most participants in our study agreed and strongly agreed with family planning and the consumption of iron tablets. Also, in the same study, a positive attitude towards the disapproval of multiple pregnancies was reported by 97.7% of participants. Positive attitude towards the use of family planning methods was also found among these participants (73.3%; IDA). Similarly, most pregnant mothers in our study had positive attitude toward family planning and prevention of IDA but it was low in frequency and percentage, which could be due to the difference in sample size and study area.

A study on 400 pregnant women in Iasi, Romania (2010) showed that 45.3% of participants had used iron supplements during pregnancy, which is lower than that of our study. In another report from the cross-sectional analysis of data collected from 836 participants in Porto, Portugal (2008), it was reported that the prevalence of the use of supplements during pregnancy was 55.4% for folic acid, which is consistent with the results of our study.

Also, the prevalence of women who took iron tablets and syrup during their most recent pregnancy was 44% in 2012 in the Kyrgyz Republic, which is lower than that of our study, which could be due to the differences in study area and habit of using tablets.

In another study done in West Shoa, Ethiopia, it was reported that only 31.5% of participants did not drink tea or coffee with meal, but that was higher in our study, which could be due to sample size. 71% of the participants in that study took iron supplements with fruits juices. That is less in our study, which could be due to different habits. A similar study on 50 antenatal mothers in India showed that iron float tablet was adequately consumed by 62% of mothers.

Conclusion

According to the findings of our study, approximately one third of pregnant women were with IDA, which is lower than those of other studies. This could be due to the fact that most pregnant mothers had knowledge on causes and prevention of anemia. They also had positive attitude towards most preventing methods of IDA such as family planning and iron supplements. Most pregnant mothers took supplements of folic acid during their pregnancy, and had a habit to feed on various types of food rich in iron. Our results indicate that more needs to be done to decrease this prevalence of IDA by increasing the knowledge, attitude, and

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skills necessary for the prevention of IDA. It is vital that all study areas surrounding health facilities and offices work on promoting the awareness, perception and utilization of preventive methods of IDA during pregnancy.

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Conflicts of Interest

We declare that we have no competing interests.

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