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Research Article

Pregnant Mothers' Knowledge, Attitude, and Practice Towards Prevention of Iron Deficiency Anemia in Georgia

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ABSTRACT

Background: Anemia in pregnancy is a serious global health challenge, particularly affecting developing countries.
Objectives: This study aimed to explore pregnant women's attitudes and perceptions regarding preventing iron deficiency anemia (IDA).
Subjects and Methods: A qualitative research method was used to survey pregnant women with IDA and physicians through in-depth interviews. The target sample consisted of 9 gynecologists and 26 pregnant women, selected through purposive sampling from three maternity hospitals in Tbilisi (Georgia).
Results: The majority of pregnant women (n=22; 84.6%) had some knowledge about IDA and correctly identified its symptoms. However, despite high awareness, most lacked adequate knowledge about the causes and risk factors of IDA. While pregnant women were aware of healthy eating practices, they did not follow a proper diet. Obstacles to healthy eating included limited financial access to food as well as cultural and religious barriers. Although respondents had some knowledge about iron-rich foods, they were generally unaware of the need to take iron supplements for prevention. The majority of pregnant women (n=21; 80.8%) received little information about anemia from their family physicians, indicating a limited role of family doctors in IDA prevention during pregnancy.
Conclusions: Although pregnant women possess knowledge and positive attitudes towards IDA prevention, their practices remain insufficient. The findings suggest a weak connection between knowledge of IDA prevention and healthy behavior, contributing significantly to anemia prevalence. To address this issue, it is essential to promote proper nutritional counseling for pregnant women during antenatal care, with a focus on strengthening family doctors' involvement. Additionally, awareness should be increased among women of reproductive age and adolescent girls.

Introduction

Iron deficiency anemia (IDA) in pregnancy is a condition in which the hemoglobin (HB) level in a pregnant woman's body decreases. The World Health Organization defines anemia during pregnancy as an HB level below 11.0 g/dL and below 10.0 g/dL in the postpartum period (1). Iron is essential for the production of red blood cells, which transport oxygen throughout the body. When red blood cell counts decrease, organs and tissues do not receive the oxygen they need. There are two types of iron deficiency:

- Hidden or latent iron deficiency: This type is characterized by reduced iron stores in the bone marrow, while red blood cell count and HB levels remain normal.

- IDA is characterized by a decrease of all metabolic funds, and also by a reduction of red blood cells and HB.

It is important to note that foods contain both heme and non-heme iron. Heme iron, found in red meat, poultry, and fish (such as salmon, tuna, and sardines), is a component of HB and myoglobin. Non-heme iron, present in nuts, cereals, spinach, and broccoli, is stored in the body as ferritin and transported throughout the body via transferrin (2).

Despite iron's abundance on earth, iron deficiency is common worldwide, making it the most widespread nutritional deficiency. In developing countries, iron deficiency often results from blood loss due to nutrient deficiencies or parasitic infections such as helminths, while in developed countries, it is often associated with specific dietary behaviors (e.g., vegetarian diets and avoidance of red meat) and pathological conditions (e.g., chronic blood loss or malabsorption) (3,4,5).

Iron deficiency can have serious consequences, particularly for children and pregnant women, as the demand for iron significantly increases during pregnancy (6). If a pregnant woman has insufficient iron stores, IDA may develop, leading to complications such as deterioration of maternal perinatal and postpartum health, growth retardation, and impaired cognitive and motor development in the newborn. IDA also increases the risks of maternal mortality and low birth weight (7).

Studies show that individual iron supplementation and proper nutrition are among the most effective strategies to address IDA (8). According to WHO recommendations, increasing daily iron intake to 15-30 mg/day is essential. Daily intake of iron and folic acid reduces the risk of maternal anemia by 70% and iron deficiency by 57%. WHO recommends daily iron supplementation as part of antenatal care to reduce the risk of IDA, iron deficiency, and low birth weight.

Pregnant women should focus not only on the quantity but also on the quality of their diet. A balanced diet that is low in fats and carbohydrates and rich in protein, calcium, iron, and vitamins is recommended. Iron-rich foods include legumes, leafy green vegetables (especially spinach), bread, dried fruits, eggs, red meat, and fish (9,10).

According to the WHO, 27% of the global population suffers from IDA. Data from 2019 indicate that IDA affects 30-60% of pregnant women worldwide and is responsible for 22% of maternal deaths (11). Globally, IDA-related maternal and neonatal mortality is estimated to reach 2.5-3.5 million cases (12). The WHO has adopted a global program to improve maternal and child nutrition, intending to reduce anemia prevalence among women of reproductive age by 50% by 2030 (13). However, recent findings suggest that the reduction in anemia prevalence is slower than initially anticipated, with particularly high rates observed among pregnant women in middle- and low-income brackets (14).

In Georgia, 2023 data indicate that 40.6% of pregnant women experienced anemia at least once during pregnancy (15) - a rate higher than the global average of 37% ( ). Georgia's State Maternal and Child Health Program includes eight antenatal visits, with free iron supplements for pregnant women diagnosed with IDA (17).

Despite numerous prevention methods, IDA remains a persistent issue, with many women still facing health complications associated with anemia. The risk factors contributing to IDA depend heavily on pregnant women's awareness and attitudes, which are influenced by their primary healthcare providers, including obstetrician-gynecologists and family doctors. Improving the education of pregnant women and encouraging proactive attitudes among healthcare providers may significantly reduce IDA prevalence (18).

The above emphasizes the importance of effective strategies for reducing IDA, particularly in developing countries like Georgia, where the population faces significant social challenges (19).

The knowledge and perceptions of pregnant women about IDA and its risk factors have not yet been studied in Georgia. Addressing gaps in knowledge and perceptions about IDA among pregnant women through targeted educational programs is a crucial step in combating this issue. Therefore, such research is essential for developing effective strategies to reduce IDA.

This study aimed to explore the knowledge, attitudes, and perceptions of pregnant women in Georgia regarding the prevention of IDA. Research findings can inform policy changes and health education programs, ultimately improving maternal health outcomes.

Subjects and Methods

A phenomenological qualitative study was conducted to explore the experiences of pregnant women with IDA through in-depth interviews. A phenomenological qualitative study is a research design used to explore and understand the experiences of individuals regarding a particular phenomenon. The focus is on capturing the essence of participants' experiences as they perceive and interpret them. This approach is rooted in phenomenology, a philosophical tradition that seeks to describe how people make sense of their experiences. The purpose of qualitative study is to gain deep insights into participants' subjective experiences and meanings. Typically involves in-depth interviews. Researchers identify themes, patterns, and shared meanings to describe the essence of the phenomenon. Outcome of the qualitative is A rich, descriptive account that explains how individuals experience and make sense of the phenomenon in their unique contexts.

This design is commonly used in health sciences, education, and social sciences to explore topics like coping with illness, cultural practices, or life transitions.

The study included obstetricians-gynecologists and pregnant patients. The target sample consisted of 9 gynecologists and 26 pregnant women, selected through purposive sampling from three maternity hospitals in Tbilisi (see Table 1).

Pregnant women were initially invited to participate by a nurse. Upon consenting to join the study, a face-to-face meeting was arranged in the polyclinic departments of maternity hospitals during working hours, from 11 am to 3 pm. Women interested in participating were fully informed by the researcher about the study's objectives, process, and ethical considerations. After providing written consent, participants were selected. The inclusion criteria included pregnant women diagnosed with IDA without any complications.

Data were collected through individual in-depth interviews with obstetricians-gynecologists and pregnant patients between March and July 2024. Each interview lasted approximately 35 to 50 minutes and was recorded using a digital voice recorder. The recordings were fully transcribed and verified for accuracy. Transcripts were reviewed

multiple times to gain a deeper understanding of each interview. Codes were then grouped by source category and topic.

Table 1: Demographic characteristics of pregnant women

Characteristics	n=26	%
Age		
18-20	2	7.7
21-33	18	69.2
≥ 34	6	23.1
Number of children		
0	15	57.7
1	11	42.3
> 2		
Employment		
Employed	7	26.9
Self-employed	5	19.2
Housewife	14	53.8
Education		
Secondary education	9	34.6
Bachelor	13	50
Master	4	15.4
Income status		
250 GEL	3	11.5
250-500 GEL	11	42.3
500-800 GEL	9	34.6
800 GEL	3	11.5
Gestational age		
≤12 weeks	15	57.7
≥12 weeks	11	42.3

Ethical Issues

Approval to conduct the research was obtained from the Ethics Council of Caucasus University (CAU No. 012/23). Respondents were informed in advance about the study's objectives, and confidentiality was strictly maintained throughout. Pregnant women participated voluntarily and were free to withdraw from the study at any time without providing a reason. All study data were anonymized using individual codes and presented without personal identifiers.

Research Limitations

The study was conducted in a limited number of randomly selected clinics, outpatient facilities, and maternity hospitals, which limits the generalizability of the results. Additionally, a lack of statistical data and literature on the prevalence and prevention of IDA in Georgia posed another limitation.

Results

Results of a Survey of Obstetrician-Gynecologists

Causes of IDA in Pregnancy

The doctors named the worsening socioeconomic situation as one of the reasons for the increase in the prevalence of inadequate nutrition and anemia. Pregnant women cannot afford many expensive foods, which has become one of the causes of IDA.

"This is the most common situation in our reality. About 80% of my pregnant patients are anemic. Cases of anemia have increased significantly in recent years. It should be noted that in the 80s and 90s of the last century, anemia was less common than now. In my opinion, the reason for this is a change in diet. Previously, pregnant women ate a lot of meat and fat, and meat, as is widely known, prevents IDA, but increases the risk of overweight and hypertension. Now the opposite is true, due to socioeconomic problems, pregnant women receive mainly vegetarian foods, that protects against hypertension but increases the prevalence of anemia".

1st gynecologist.

One of the gynecologists named the short interval between pregnancies and especially multiple pregnancies as the main cause of IDA.

"During pregnancy, conditions conducive to anemia are created. The mother's body supplies the fetus with the substances it needs, including iron. With repeated pregnancies after a while, iron stores in the mother's body cannot be restored, and this is one of the leading causes of IDA".

2nd gynecologist.

According to one of the gynecologists, the increased prevalence of IDA is the result of environmental problems (for example, increased levels of radiation), poor food quality, stress, and unstable economic and marital status.

"Most of the imported products are expired and contain harmful, toxic substances."

3rd gynecologist.

Knowledge of IDA and following its prevention methods

Some doctors (n=7; 77.8%) expressed satisfaction with the general awareness of pregnant women about proper nutrition. In their opinion, pregnant women usually follow the advice as much as possible. However, most of them (n=8; 88.9%) are not satisfied with the adherence of pregnant women to medical recommendations, citing socioeconomic difficulties as the main reason.

"Women read a lot and come to my clinic with basic knowledge about healthy eating."

4th gynecologist.

"When I give my pregnant patients advice on proper nutrition, they are silent and just look at me. How can we afford all these products? "

5th gynecologist.

"The state program for pregnant women does not include free iron supplements, this is why most pregnant women do not want to buy iron supplements for financial reasons."

6th gynecologist.

Preventive methods of IDA

Although doctors prescribe iron supplements and a proper diet to pregnant patients to prevent IDA, the problem still exists. According to most doctors (n=8; 88.9%), it is desirable to distribute free iron supplements and prenatal vitamins to pregnant women in maternity hospitals and women's outpatients. Doctors believe preventive iron replacement therapy is ineffective without properly informing pregnant women.

"If a pregnant woman is unaware of the risk of IDA, she doesn't even want to take vitamins." Therefore, in any case, it is necessary to inform patients about the importance of iron supplements. "

7th gynecologist.

"Sometimes we have a long line of pregnant women waiting for a consultation and we simply don't have time to talk to every pregnant patient about nutritional issues. Brochures about lactation are available, which we printed for our patients. These brochures make it easier for us. Of course, we emphasize the need for breastfeeding when talking to a pregnant woman, but the patient can find more information and answers to questions in this brochure. It would be desirable to create such informative brochures on healthy eating during pregnancy, especially in terms of preventing IDA, as the latter is a serious problem in today's reality."

8th gynecologist

Most doctors (n=8; 88.9%) welcome the opinion, that increasing the level of education of pregnant women and changing their attitude toward iron supplements will help fight IDA and find a way out of the situation. However, they noted that improving the socioeconomic situation was necessary to solve the problem.

The role of the family physician in the prevention of IDA

According to gynecologists (n=9; 100%), it is necessary to involve a family physician and a gynecologist in the process of managing IDA in pregnant women. In this regard, a family doctor's involvement in the process of preventing IDA in Georgia is one of the main tasks.

"There has been a trend in the country that only a gynecologist manages pregnancy as a whole and solves several problems, including IDA. The family doctor is less involved or almost does not participate in this process and does not take on this responsibility."

9th gynecologist

Results of a Survey of Pregnant Women

Knowledge and perceptions of pregnant women about anemia

Most pregnant women (n=22; 84.6%) interpreted anemia as a "lack of blood". Only four respondents (n=4; 15.4%) with higher education knew the medical definition of "anemia". A possible reason for ignorance of medical terminology may be the low level of their general education or the infrequent use of medical terminology by medical personnel when dealing with patients.

"I don't know exactly what the word" anemia "means. I first heard about it from a gynecologist"

A 21-year-old mother in her first pregnancy

Pregnant women named gynecologists, the internet, television, books, family physicians, mothers, and relatives as sources of information about anemia.

"Yes, I have heard that anemia means a lack of blood in the body, which is very common during pregnancy. The doctor advised me to do a blood test as he told me that the number of red blood cells in my blood was reduced, and I had low HB levels."

A 22-year-old mother with one child

Respondents mainly described anemia for its symptoms, such as general weakness, mild fatigue, decreased appetite, nausea and vomiting, aversion to some types of food, pallor of the skin, and conjunctiva, "black circles under the eyes," "dizziness," "fainting," "white lines on the nails."

Twelve respondents (n=12; 46.2%) had mild to moderate weakness during pregnancy, and some experienced dizziness; However, due to the mild course, none of them consulted a doctor. Anemia is not a serious condition, according to some respondents, as anemia-related weakness and dizziness are "normal during pregnancy."

"*Fatigue and weakness are part of pregnancy. It doesn't affect the mother or her baby".*

A 23-year-old mother with two children

"*A pregnant woman carries a different body inside her. It's something new for her body, and she may get tired because of it, or she may have dizziness and other symptoms. "*

A 21-year-old mother with one child

"Feeling nauseous and disgusted with certain foods during pregnancy is natural. Gradually, the pregnant woman adapts to these symptoms".

A 22-year-old mother with two children

Respondent's perception of anemia as a "normal phenomenon of pregnancy" was also supported by the fact that women of reproductive age shared similar experiences in social networks. In their opinion, anemia was a natural part of pregnancy, because at this time changes occurred in the body that did not cause any harm to either the child or the mother.

"If other women, despite these symptoms, can give birth normally and safely, then why take it seriously?"

A 27-year-old-woman with two children

According to the respondents, the symptoms of anemia can be eliminated by resting and eating certain foods.

"I often experience fatigue, dizziness, and weakness during pregnancy. My mother tells me that this is natural during pregnancy. I rest at such times. I feel good after rest."

A 25-year-old mother with two children

However, if pregnant women experienced severe weakness, fever, abdominal pain, white vaginal discharge, or bleeding, they understood, that these symptoms could have a severe impact on the baby and usually consulted a doctor.

"Bleeding can harm the baby, because it won't have enough blood supply, and it can interfere with the development of my son. Bleeding can also cause premature birth or miscarriage."

A 27-year-old mother with two children

"Abdominal pain is a dangerous sign because the baby is growing in my belly and everything that affects me will affect my baby; Therefore, in case of abdominal pain, you should immediately consult a doctor."

A 23-year-old mother with two children

IDA: Causes

The majority of respondents (n=23; 88.5%) noted that the main causes of anemia during pregnancy are insufficient, unbalanced, and low-quality nutrition, sharing blood with the fetus, increased energy consumption, emotional stress, long exposure to the sun, and physiological factors.

Although the respondents mentioned various causes of anemia, almost none of them had the correct knowledge of the etiology of anemia.

"During pregnancy, we need extra nutrition because we are sharing blood with our baby. Therefore, we should eat more vegetables that will increase our HB."

A 24-year-old mother with one child

"When a woman does not follow a proper diet and has emotional problems, does not walk outdoors every day - all this can contribute to the development of anemia."

A 21-year-old mother in her first pregnancy

"Anemia can be caused by the lack of a balanced diet containing essential nutrients that can maintain the necessary volume of blood in the body."

A 20-year-old mother with one child

"Anemia is especially common during pregnancy because a new life is developing inside a woman and therefore, she needs more energy and strength."

A 27-year-old mother with two children

"Prolonged exposure to the sun during working hours and tedious work can lead to a decrease in the amount of blood in the body."

A 21-year-old mother with two children

"Pregnancy can cause anemia because the fetus receives blood from the mother, meaning the blood volume of the fetus depends on the mother's blood. This is how the mother passes on some of her blood to the fetus".

A 19-year-old mother with one child

The role of food in the prevention of IDA

Respondents unanimously stated that the most effective way to prevent anemia in pregnant women was to eat a healthy diet, with medications playing a secondary, supportive role. By their definition, a healthy diet is "nutrient-rich"; "High-calorie," "consisting mainly of dairy products, vegetables and fruits," and "vitamin-rich nutrition."

Most of the study participants (n=23; 88.5%) said pregnant women should eat foods such as fruits, vegetables, meat, milk, dairy and natural juices since healthy food "gives energy and strength to a pregnant woman," which "increases the amount of blood in the body."

"In my opinion, eating properly during pregnancy is more important than ever. We need more fruit and vegetables, we need to eat meat, drink milk and eat more dairy, and natural juices, because healthy food "gives energy and strength to a pregnant woman", and "increases the amount of blood in the body. It is necessary to eat only healthy food every day, which will give the child all the important nutrients. Also, a healthy diet will contribute to the birth of a child with a normal weight. "

A 27-year-old mother with two children

"We should eat foods that can increase blood volume and raise HB levels, such as red meat, beans, honey, walnuts, pomegranate juice, and more. Doctors teach us to eat properly. We must follow their instructions to improve. "

A 22-year-old mother with two children

"I try to make my diet as diverse as possible. A pregnant woman's diet is unimaginable without dairy products as a source of protein and calcium. Also, taking 1-2 tablespoons of red wine, a day improves the HB index".

A 23-year-old mother with two children

When asked if the diet of pregnant women should be different from that of non-pregnant women, the majority of pregnant women (n=24; 92.3%) answered positively, but the answers to what should be the diet of a pregnant woman varied.

"One of the peculiarities of pregnancy is that a pregnant woman may want to eat something different, even strange. Therefore, she must satisfy her desire and eat what she wants. The happier the expectant mother is, the more likely she is to give birth to a healthy child. For example, I have a strong desire to eat pickles and Staphylea, although I know it is not recommended to eat these foods during pregnancy".

A 21-year-old mother in her first pregnancy

"It's important to me to eat the foods I want during pregnancy, even though my doctor recommends other foods to prevent anemia."

A 19-year-old mother in her first pregnancy

Most pregnant women (n=22; 84.6%) were more or less satisfied with their diet. They reported that they increased the amount of meat, dairy, fruit, and vegetables in their diet during pregnancy.

"I am satisfied with my diet. I believe that I have an optimal diet for my condition."

A 22-year-old mother with one child

Although pregnant women had adequate knowledge about healthy eating, they did not follow the necessary, correct diet. Their daily intake of necessary food was unstable. According to several pregnant women (n=7; 26.9%), their diet would be more diverse if they had a better financial situation. One of the obstacles to healthy eating is the high price of food products and less financial access:

"We have to eat a lot of vegetables and fruit during pregnancy, but with food prices rising, it's impossible to eat good food every day."

A 22-year-old woman pregnant with a second child

"If I don't have the money, how can I eat good and healthy food?"

A 29-year-old mother of two children

However, cultural barriers also affect the nutrition of pregnant women. Some women (n=7; 26.9%) relied on a vegetarian diet because of their religious orientation. They also noted that the responsibilities of caring for other family members made it difficult to maintain a healthy diet during pregnancy.

"Being responsible for family members makes it difficult to look after yourself. It's very different when you're in your mother's house,

where you can spend more time on yourself and do whatever you want. "

A 21-year-old mother in her first pregnancy

"I have a mother-in-law and another child at home, and I have to look after them, cook them, and do other things. I get very tired. Sometimes I can't eat in time".'

A 24-year-old mother with one child

According to pregnant women, it is necessary to get more information about "diet and food composition".

"We would like to know more about the foods that are recommended during pregnancy."

A 21-year-old mother in her first pregnancy

Knowledge of pregnant women about foods containing iron and folic acid

Almost every woman (n=24; 92.3%) has heard the words iron and folic acid. They had some idea about foods containing iron, but most of the respondents (n=24; 92.3%) did not know that the cause of anemia is iron deficiency in their bodies. Also, none of the pregnant women knew about foods containing folate.

"Iron is found in fruits, green vegetables, eggs, meat, and fish."

A 21-year-old mother in her first pregnancy

"Foods like fruits and vegetables, especially green vegetables, contain iron."

A 26-year-old mother with one child

"I don't know any food that is high in folate, it can only be taken as a medicine."

A 22 -year-old-mother in her first pregnancy

Knowledge and attitude of pregnant women toward iron-folic acid supplementation

Almost all respondents (n=22; 84.6%) had some idea about iron and folic acid supplements. However, only five women (n=5; 19.2%) identified iron deficiency as a cause of anemia.

The respondents reacted positively to iron preparations for the prevention of IDA. Taking iron and folic acid drugs has a positive effect on women and children's health, "empowers" and is useful for "preventing frailty in women," especially during pregnancy, they said.

"Yes, I know that women should take these supplements during pregnancy- because after taking them, the body feels better, and they help a mother and a growing child to be strong and healthy. "

A 21-year-old woman in her first pregnancy

"Women should take iron and folic acid supplements during pregnancy to stay healthy and strong. It helps you to have a healthy baby."

A 20-year-old woman in her first pregnancy

"I know that iron and folic acid supplements have a positive effect on women's health, especially during pregnancy. It promotes blood production and prevents anemia during pregnancy."

A 20-year-old woman with one child

Some of the interviewed pregnant women (n=12; 46.2%) regularly took iron and folic acid supplements. Respondents explained their regular use of these supplements by the fact that health professionals convinced them of their positive impact on the physical and mental development of the child.

They also believed that supplements should be good for the baby because "doctors know best what is best for pregnant women":

"The doctor explained that these supplements will help my child's mental development. I trust my doctor. By taking these supplements, my child will be born healthy."

A 26-year-old mother with one child

"My dream is to have a healthy child. For my child to be born healthy, I must take supplements regularly. However, you cannot rely on medication alone. There should be a balance between healthy eating and medication."

A 21-year-old woman in her first pregnancy

A small part of the surveyed pregnant women (n=6; 23.1%) did not want to take any medication during pregnancy at all. According to them, if the diet is rich and varied, there is no need to take additional iron preparations to prevent IDA.

"Eating healthy food is more important than taking medicines because nutrition is the body's natural way of development."

A 22-year-old woman with one child

"It is quite possible that iron tablets are more harmful. I can fight anemia with proper nutrition - by taking iron-containing products."

A 21-year-old mother in her first pregnancy

"I prefer to avoid taking any medication during pregnancy as much as possible and iron supplements are no exception."

A 22-year-old woman in her first pregnancy

"Now my son needs good nutrition. So, I will only take the medicine if it has a good effect on my child's growth. "

A 24-year-old mother with one child

These women were unaware of the health problems that could occur if they did not take iron and folic acid supplements before and during pregnancy. However, some pregnant women (n=12; 46.2%) have reported that if they do not take these supplements, the growing child may have physical or mental health problems.

"If women don't take these supplements during pregnancy, they will be physically weak. Not taking supplements harms a child's health, especially their physical or mental health. "

A 22-year-old mother in her first pregnancy

Most pregnant women (n=22; 84.6%) were not aware of the recommended dose of iron and folic acid preparations, which might be due to their low education levels.

Adherence of pregnant women to iron and folic acid supplementation

Some of the pregnant women (n=12; 46.2%) in the study reported not knowing when women should start taking these supplements. This shows that some health professionals do not provide their pregnant patients with adequate information about iron and folic acid supplements.

"I don't know exactly when pregnant women should start taking iron and folic acid supplements, but I know women should start taking them when they get pregnant."

A 19-year-old mother in her first pregnancy

Only a few pregnant women (n=10; 38.5%) knew about the need to start taking these supplements before pregnancy.

"Women should start taking iron and folic acid preparations early in pregnancy, preferably months before pregnancy."

A 20-year-old mother in her first pregnancy

Most participants (n=22; 84.6%) did not know why pregnant women should take iron and folic acid supplements before pregnancy.

"I know why women should start taking these supplements before pregnancy. If women do not take preventive measures before pregnancy, the baby may be born weak mentally and physically."

A 22-year-old mother with two children

Discussion

According to research, the main causes of IDA are inadequate nutrition, poor food quality, environmental issues (such as increased radiation levels), stress, unstable economic conditions, and short intervals between pregnancies. Although doctors report that pregnant women are somewhat informed about proper nutrition, many do not follow medical recommendations due to socioeconomic challenges. Gynecologists noted that family doctors are minimally involved in managing IDA in pregnant women and often do not take responsibility for this issue, largely due to the underdevelopment of primary healthcare in Georgia (20,21,22, 23, 24,25 ,26, 27).

Increasing the involvement of family doctors is considered essential for preventing IDA. Doctors believe that it is necessary to provide free iron supplements and prenatal vitamins to pregnant women in maternity hospitals and outpatient clinics. They also emphasize the importance of raising educational levels among pregnant women and changing attitudes toward iron supplements, though socioeconomic improvements are crucial to effectively addressing the problem.

The study revealed that nearly all respondents had some awareness of IDA, with most correctly identifying its symptoms. This relatively high level of awareness among pregnant women may be due to the socioeconomic characteristics of the study participants, as the research was conducted among urban pregnant women who may have greater access to information about anemia. The study's finding aligns with results from similar studies conducted in various regions (28, 29). For instance: A study in Malaysia reported that 98.3% of respondents recognized iron deficiency anemia as the most common type of anemia (30). Similarly, 92.8% were aware of its symptoms, highlighting high levels of knowledge about IDA among participants who had access to education and health information resources. Research in Ethiopia among urban populations demonstrated that educational attainment and access to antenatal care significantly influenced knowledge levels about IDA. Those living in urban areas, often with better access to healthcare information, showed higher awareness and understanding of anemia symptoms and prevention strategies (31). These findings collectively suggest that urban residency and access to healthcare education play crucial roles in increasing awareness of anemia, aligning with your study's observations. This underscores the importance of targeting rural and less-educated populations to bridge gaps in awareness.

Despite this awareness, however, most respondents did not understand the clinical definition of anemia, its causes, or the risk factors associated with IDA. Many defined anemia as a "lack of blood supply" and considered it a "normal, natural" condition during pregnancy that does not harm the mother or child and does not require medical intervention. These views suggest that, despite educational efforts by governmental and non-governmental organizations, pregnant women's perceptions of anemia have changed little over the years (32). The high prevalence of anemia among pregnant women reinforces the perception that "anemia during pregnancy is normal."

Several studies corroborate the finding that pregnant women often have limited understanding of anemia's clinical aspects, including its causes and risks, while considering it a "normal" condition. Research in Indonesia highlighted that pregnant women frequently viewed anemia as a natural part of pregnancy, perceiving symptoms like fatigue and paleness as typical rather than concerning (33). Many lacked awareness of the significance of hemoglobin levels as a diagnostic marker, reflecting minimal understanding of anemia's clinical basis and potential risks. A study in East Sumba, Indonesia, found that while government efforts to promote iron supplementation were robust, many women underestimated anemia's seriousness, perceiving it as a minor inconvenience rather than a health threat to both mother and child (34). This contributed to low compliance with iron supplementation regimens. Similar findings in other developing regions suggest that cultural beliefs and misconceptions reinforce the notion that anemia is a natural condition during pregnancy, not requiring medical attention, leading to underestimation of its complications (35). These studies underscore the need for culturally tailored educational interventions to improve awareness and reshape perceptions about anemia's risks and prevention strategies during pregnancy.

Respondents consistently noted that a healthy diet is the best preventive method for anemia. However, they did not consistently adhere to proper nutritional practices, with unstable daily intake of essential foods. Although they were somewhat aware of iron-containing foods, most were unaware that iron deficiency is the underlying cause of anemia. Additionally, none of the pregnant women were familiar with foods containing folic acid, often perceiving folic acid solely as a medication. Similar results have been reported in other studies (36,37). Studies have reported findings similar to the observation that while many pregnant women identify healthy diets as key to preventing anemia, their actual dietary practices and knowledge of micronutrients remain inconsistent. For instance, research from Ethiopia indicated that while pregnant women were generally aware of anemia and its prevention, adherence to proper dietary intake and iron-folic acid supplementation was low (38). Many women misunderstood the relationship between specific nutrients like iron and folic acid and their role in anemia prevention, with folic acid often seen as a medication rather than a dietary component. In a study in Indonesia and India, it was observed that nutrition education interventions improved knowledge and adherence

to dietary recommendations, yet significant gaps persisted before the interventions. Women lacked familiarity with food sources rich in iron and folic acid, similar to the findings in our study (39). Additionally, a study in Ethiopia highlighted regional disparities, with low adherence to dietary guidelines despite general awareness of anemia's risks during pregnancy (40). These studies collectively emphasize the need for targeted nutrition education that increases awareness and bridges the gap between knowledge and consistent practice, reinforcing the importance of proper nutrition and supplementation during pregnancy.

While most pregnant women in this study knew about anemia prevention strategies, they did not follow correct dietary patterns. Rising food costs and limited financial resources were major barriers to a healthy diet. A study by Bhutta et al. (2013) emphasized that socioeconomic factors, particularly rising food costs and limited financial resources, significantly affect pregnant women's ability to access iron-rich foods such as red meat, leafy greens, and fortified products (41). These barriers disproportionately impact low-income populations, exacerbating disparities in maternal and neonatal health outcomes.

Cultural factors also influenced dietary habits; some women followed vegetarian diets due to religious or cultural beliefs, reducing iron intake from meat products. Additionally, the responsibility of caring for other family members made it difficult for some women to maintain a balanced diet during pregnancy, highlighting the potential benefits of involving family members in anemia prevention. Other studies, such as one conducted in South Asia (Sharma et al., 2019), explored how cultural practices and dietary restrictions—such as vegetarianism influenced by religious or cultural beliefs—can limit the intake of heme iron (42). Non-heme iron sources, although present, are less bioavailable and require careful meal planning for adequate absorption, a practice not always feasible for all women. Research also suggests that family involvement plays a crucial role in improving maternal nutrition. For instance, a study by Ahmed et al. (2021) demonstrated that engaging family members in nutrition education improved adherence to anemia prevention practices (43). When family responsibilities are shared, women are better able to prioritize their dietary needs.

The findings of our study reinforce the need for multifaceted public health interventions, including:

- Nutrition education campaigns that address cultural sensitivities and promote locally available iron-rich foods.
- Economic support programs like food subsidies to make iron supplements and fortified foods accessible.
- Community-based initiatives that involve family members to foster shared responsibility for maternal nutrition.
- By integrating these approaches, interventions can better address the complex social, economic, and cultural barriers to anemia prevention during pregnancy.

Many pregnant women held misconceptions about anemia prevention methods, believing that proper nutrition alone was sufficient to prevent IDA and that there was no need for iron supplements. They expressed concerns that iron supplements, like other medications, could negatively affect the fetus. Most were unaware of the potential health risks associated with inadequate iron supplementation, which may be due to lower educational levels.

Research has shown that doctors spend limited time counseling pregnant women about IDA. Most women relied on information from the internet, television, or literature, while some received information from gynecologists. Notably, only one of the interviewed women reported receiving counseling on IDA from a family physician, highlighting the limited role of family doctors in IDA prevention.

Conclusion

Despite some knowledge about the causes and prevention of IDA, its prevalence remains high in Georgia. This suggests a lack of connection between knowledge and the healthy behaviors necessary to reduce anemia rates. These findings underscore the need for a multifaceted approach to address IDA, including improved preventive measures, greater involvement of family physicians, and enhanced government recommendations and nutrition programs for pregnant women. Providing free iron supplements to pregnant women in maternity hospitals and outpatient clinics is highly recommended.

While knowledge is essential, it is not sufficient to drive the behavioral changes required to improve health. Increased public engagement and effective policy interventions are crucial in addressing these challenges.

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Conflict of Interest

The authors declare no conflicts of interest.

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