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Awareness and Nutritional Practices Regarding Iron Deficiency among Pregnant Women in Zliten, Libya

Souad Faraj Mohammed Daadoush [1*]

[1] Department of Gynecology and Obstetrics, Faculty of Medicine, University of Elmergib, Libya

*Corresponding author: E-mail addresses: souadfareg77@gmail.com

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ABSTRACT

Background: Iron deficiency remains one of the most common nutritional disorders affecting pregnant women worldwide and represents a major public health challenge, particularly in low- and middle-income countries. Adequate maternal knowledge and appropriate nutritional practices are essential for preventing iron deficiency and improving pregnancy outcomes. **Objective:** This study aimed to assess pregnant women's knowledge, awareness, and nutritional practices regarding iron deficiency among attendees of Al-Houriat Health Center in Zliten, Libya. **Methods:** A descriptive cross-sectional study was conducted among 52 pregnant women using a structured questionnaire consisting of demographic characteristics and two domains assessing knowledge of iron deficiency and nutritional practices. Content validity was established through expert review, while internal consistency was confirmed using Cronbach's alpha ($\alpha = 0.86$). Data were analyzed using SPSS, employing descriptive statistics and one-sample *t*-tests at a significance level of $p < 0.05$. **Results:** The findings demonstrated a high level of knowledge and awareness regarding iron deficiency during pregnancy (Mean = 2.69 ± 0.29; Relative Mean = 89.7%; $p < 0.001$). Participants also exhibited a high level of nutritional awareness related to iron deficiency prevention (Mean = 2.42 ± 0.34; Relative Mean = 80.6%; $p < 0.001$). Nevertheless, moderate adherence was observed for several recommended nutritional practices, particularly those related to dietary adequacy and regular use of iron supplements, indicating a gap between knowledge and actual behavior. **Conclusion:** Pregnant women attending Al-Houriat Health Center demonstrated satisfactory knowledge and nutritional awareness regarding iron deficiency. However, improving nutritional practices requires continuous health education, individualized dietary counseling, and enhanced adherence to antenatal nutritional recommendations. Strengthening maternal nutrition education programs may contribute to reducing the prevalence of iron deficiency and improving maternal and neonatal health outcomes in Libya.

1. INTRODUCTION

Iron deficiency (ID) is one of the most widespread micronutrient deficiencies worldwide and remains a major public health concern, particularly among women of reproductive age. Pregnancy substantially increases the physiological demand for iron due to maternal blood volume expansion, placental development, and fetal growth. When these increased requirements are not met through adequate dietary intake or appropriate supplementation, pregnant women become vulnerable to iron deficiency and iron deficiency anemia (IDA), conditions that are associated with considerable maternal and neonatal morbidity. According to the World Health Organization (WHO), anemia affects approximately one-third of

pregnant women globally, with iron deficiency representing the leading underlying cause (World Health Organization: WHO, 2024). Maternal iron deficiency extends beyond hematological abnormalities and has profound implications for maternal health and fetal development. Evidence indicates that inadequate iron status during pregnancy increases the risk of maternal fatigue, impaired immune function, postpartum hemorrhage, preterm delivery, low birth weight, intrauterine growth restriction, and delayed cognitive and neurological development in offspring. Furthermore, iron plays a fundamental role in oxygen transport, cellular metabolism, DNA synthesis, and neurodevelopment, making adequate iron nutrition an essential component of quality antenatal care (American College of Obstetricians and Gynecologists [ACOG], 2021; Pavord et al., 2024). Despite continuous improvements in maternal healthcare services, iron deficiency remains highly prevalent in low- and middle-income countries, where nutritional inadequacy, limited health education, socioeconomic constraints, and poor adherence to iron supplementation programs continue to hinder effective prevention. In North Africa, including Libya, the burden of iron deficiency among pregnant women remains substantial, although reported prevalence varies considerably across geographical regions and healthcare settings. Such variation reflects differences in dietary habits, healthcare accessibility, socioeconomic status, and maternal awareness regarding nutritional requirements during pregnancy (WHO, 2024; WHO, 2020). Previous research has largely concentrated on estimating the prevalence of iron deficiency anemia or evaluating the effectiveness of iron supplementation during pregnancy. Other studies have investigated women's nutritional knowledge, attitudes, and dietary practices, demonstrating that insufficient awareness frequently contributes to poor adherence to nutritional recommendations and inadequate dietary behaviors. However, relatively limited evidence is available regarding pregnant women's knowledge and awareness of iron deficiency within the Libyan context, particularly at the community level. Although several studies have examined iron deficiency among pregnant women in different countries, there is a noticeable lack of evidence concerning women's awareness, nutritional knowledge, and preventive practices in Libya, especially in Zliten City. Moreover, few studies have simultaneously explored the relationship between maternal knowledge and behaviors that may influence the prevention of iron deficiency during pregnancy. This gap limits the ability of healthcare providers and policymakers to develop evidence-based educational interventions tailored to local community needs. Therefore, this study aims to assess pregnant women's knowledge, awareness, and nutritional practices regarding iron deficiency among attendees of Al-Houriat Health Center in Zliten, Libya. By providing locally generated evidence, the study seeks to support healthcare professionals and decision-makers in designing targeted maternal nutrition programs that improve antenatal health services and reduce the burden of iron deficiency during pregnancy. Iron deficiency remains one of the leading nutritional disorders affecting pregnant women worldwide despite the availability of effective preventive strategies and routine antenatal care. Although iron supplementation and nutritional counseling are widely recommended, many pregnant women continue to experience inadequate dietary practices and insufficient knowledge regarding the causes, consequences, and prevention of iron deficiency, particularly in low- and middle-income countries. In Libya, evidence on pregnant women's awareness and nutritional practices related to iron deficiency is limited, and few studies have investigated these issues at the community level. This lack of locally generated evidence restricts the ability of healthcare providers to design targeted educational interventions and improve maternal nutrition programs. Therefore, assessing pregnant women's knowledge, awareness, and nutritional practices in Zliten is essential for identifying existing knowledge gaps and supporting evidence-based strategies to reduce the burden of iron deficiency during pregnancy.

SPECIFIC OBJECTIVES

1. To assess pregnant women's level of knowledge regarding iron deficiency during pregnancy.
2. To evaluate pregnant women's awareness of the causes, symptoms, complications, and prevention of iron deficiency.
3. To examine nutritional practices related to iron deficiency prevention among pregnant women.
4. To investigate the relationship between participants' demographic characteristics and their knowledge and awareness of iron deficiency.
5. To provide evidence-based recommendations for improving maternal nutrition education and antenatal healthcare services in Libya.

Iron Deficiency During Pregnancy. Iron deficiency (ID) is the most common nutritional deficiency worldwide and remains one of the leading causes of anemia during pregnancy. Pregnancy substantially increases maternal iron requirements because of the expansion of maternal blood volume, placental development, fetal growth, and increased erythropoiesis. When dietary iron intake and body iron stores are insufficient to meet these physiological demands, pregnant women become vulnerable to iron deficiency and iron deficiency anemia (IDA), particularly during the second and third trimesters of pregnancy (Cappellini et al., 2020; WHO, 2024). Iron deficiency and iron deficiency anemia are

distinct clinical conditions. Iron deficiency represents the depletion of body iron stores before a reduction in hemoglobin concentration becomes evident, whereas iron deficiency anemia occurs when iron depletion progresses to the point that hemoglobin synthesis is impaired. Because pregnancy markedly increases iron requirements, women with inadequate pre-pregnancy iron reserves are at greater risk of developing IDA unless appropriate nutritional interventions and iron supplementation are provided (Pavord et al., 2024).

Health Consequences of Iron Deficiency During Pregnancy. Iron deficiency adversely affects both maternal and fetal health. Maternal complications include fatigue, impaired physical performance, reduced immune function, postpartum hemorrhage, and increased susceptibility to infections. For the fetus, maternal iron deficiency has been associated with preterm birth, low birth weight, fetal growth restriction, and impaired neurocognitive development. These adverse outcomes emphasize the importance of early detection, nutritional counseling, and adherence to iron supplementation during routine antenatal care (ACOG, 2021; Pavord et al., 2024). Several studies have also demonstrated that nutritional awareness plays a critical role in preventing iron deficiency during pregnancy. Women with greater knowledge regarding dietary sources of iron, appropriate supplementation, and factors affecting iron absorption are more likely to adopt healthy nutritional behaviors and comply with antenatal recommendations, thereby reducing the risk of iron deficiency anemia (Alosaimi et al., 2020).

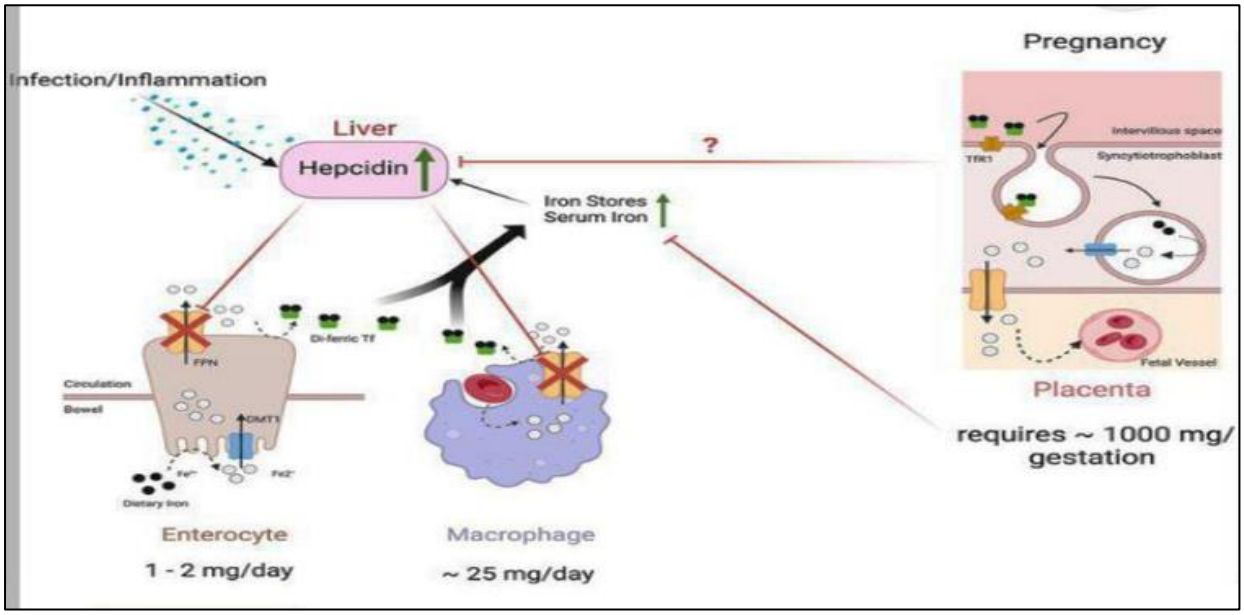

Figure 1. Regulation of Maternal Iron Homeostasis During Pregnancy: The Central Role of Hepcidin in Iron Absorption, Recycling, and Placental Iron Transfer

Iron Deficiency During Pregnancy

Iron deficiency (ID) is the most common micronutrient deficiency worldwide and remains the leading cause of anemia during pregnancy. Physiological changes during pregnancy substantially increase maternal iron requirements to support fetal growth, placental development, and expansion of maternal blood volume. Consequently, inadequate dietary intake or insufficient iron stores may lead to iron deficiency and iron deficiency anemia (IDA), particularly during the second and third trimesters (Cappellini et al., 2020; WHO, 2024).

Iron homeostasis during pregnancy is tightly regulated by **hepcidin**, the principal hormone controlling intestinal iron absorption and iron recycling from macrophages. Maternal hepcidin concentrations decline during pregnancy to facilitate increased iron absorption and placental transfer, thereby ensuring adequate fetal iron supply. However, disturbances in this regulatory mechanism, together with inadequate dietary intake or chronic inflammation, may contribute to maternal iron deficiency and adverse pregnancy outcomes (Fisher & Nemeth, 2017).

Maternal and Fetal Consequences

Maternal iron deficiency has significant implications for both maternal and fetal health. In pregnant women, it is associated with fatigue, impaired immune function, reduced physical performance, postpartum hemorrhage, and an

increased likelihood of developing iron deficiency anemia. For the fetus, inadequate maternal iron status has been linked to preterm birth, low birth weight, fetal growth restriction, and impaired neurological development. Evidence also suggests that maternal iron deficiency may adversely affect placental function by altering vascular development and reducing nutrient transport to the fetus (Lewis et al., 2021; Pavord et al., 2024).

Risk Factors and Prevention

Several factors increase the risk of iron deficiency during pregnancy, including inadequate dietary iron intake, short interpregnancy intervals, multiple pregnancies, gastrointestinal disorders affecting iron absorption, and poor adherence to iron supplementation. Socioeconomic status, educational level, and nutritional awareness also play important roles in influencing maternal dietary behaviors and compliance with antenatal nutritional recommendations (McLean et al., 2009). Routine iron supplementation remains the primary strategy for preventing iron deficiency during pregnancy. International guidelines recommend daily iron supplementation as part of standard antenatal care, while nutritional counseling encourages increased consumption of iron-rich foods together with vitamin C to enhance iron absorption and avoidance of substances that inhibit iron bioavailability, such as tea and coffee consumed with meals. Oral iron preparations remain the first-line treatment for most pregnant women, whereas intravenous iron is reserved for women who are unable to tolerate oral therapy or require rapid correction of iron deficiency during late pregnancy (ACOG, 2021; Pavord et al., 2024).

Gap Analysis

Despite extensive research on the prevalence, clinical manifestations, and management of iron deficiency during pregnancy, most published studies have primarily focused on epidemiological estimates, diagnostic approaches, and the effectiveness of iron supplementation. Comparatively fewer studies have examined pregnant women's knowledge, awareness, and nutritional practices regarding iron deficiency, particularly in low- and middle-income countries where nutritional deficiencies remain highly prevalent (Alosaimi et al., 2020; Pavord et al., 2024).

2. METHODS

Study Design

This study employed a descriptive cross-sectional design to assess pregnant women's awareness, knowledge, and nutritional practices regarding iron deficiency among attendees of Al-Houriat Health Center in Zliten, Libya. A cross-sectional approach was considered appropriate because it enables the assessment of participants' knowledge and health-related behaviors at a single point in time and facilitates the identification of existing awareness levels and nutritional practices within the target population.

Study Setting

The study was conducted at Al-Houriat Health Center, one of the primary maternal healthcare centers in Zliten City, Libya. Zliten is located approximately 150 km east of Tripoli and provides antenatal healthcare services to women from both urban and surrounding rural communities. Data collection was carried out over a four-month period from August to November 2025.

Study Population and Sampling

The study population consisted of pregnant women attending antenatal care clinics at Al-Houriat Health Center during the study period. A convenience sampling technique was used to recruit participants who met the eligibility criteria.
Initially, sixty (60) pregnant women agreed to participate in the study. After excluding incomplete questionnaires, fifty-two (52) questionnaires were considered valid for statistical analysis, yielding a response rate of 86.7%.

- Inclusion Criteria
- Pregnant women of any gestational age.
- Attendance at Al-Houriat Health Center during the study period.
- Ability to read and understand the questionnaire.
- Provision of informed consent.
- Exclusion Criteria
- Women with incomplete questionnaires.
- Participants who declined participation.
- Women with severe medical conditions preventing questionnaire completion.

Research Instrument

Data were collected using a structured self-administered questionnaire developed after an extensive review of previous literature concerning iron deficiency during pregnancy and maternal nutritional awareness.
The questionnaire consisted of two sections.

The first section collected participants' demographic and obstetric characteristics, including age, educational level, number of pregnancies, gestational age, and use of iron supplements.
The second section measured the study variables through two domains:
Domain 1: Awareness and knowledge regarding iron deficiency (12 items).
Domain 2: Nutritional knowledge and dietary practices related to iron deficiency prevention (17 items).
Responses were measured using a three-point Likert scale (Agree = 3, Neutral = 2, Disagree = 1), with higher scores indicating greater awareness and better nutritional knowledge.

Validity and Reliability

The questionnaire was developed based on an extensive review of the relevant literature and was subsequently evaluated by a panel of experts in biology and maternal health to establish its content validity. The experts assessed the instrument in terms of clarity, relevance, comprehensiveness, and appropriateness of the items for measuring the study constructs. Their comments and recommendations were carefully considered, and minor revisions were incorporated before administering the questionnaire.
The internal consistency reliability of the instrument was assessed using Cronbach's alpha coefficient. The overall reliability coefficient was 0.86, indicating a high level of internal consistency and confirming that the questionnaire was sufficiently reliable for measuring pregnant women's knowledge, awareness, and nutritional practices regarding iron deficiency. According to commonly accepted reliability criteria, a Cronbach's alpha value above **0.70** demonstrates satisfactory reliability for research purposes.

Data Collection Procedure

Following ethical approval, eligible pregnant women attending antenatal clinics were invited to participate voluntarily. The objectives of the study were explained to each participant, and informed consent was obtained prior to questionnaire administration.
Participants completed the questionnaire anonymously under the supervision of the researcher to ensure completeness and to clarify any questions when necessary. Confidentiality and anonymity were maintained throughout the study.

Statistical Analysis

The collected data were coded and analyzed using the Statistical Package for the Social Sciences (SPSS), version XX.
Descriptive statistics, including frequencies, percentages, means, standard deviations, and relative weights, were used to summarize participants' characteristics and questionnaire responses.
To evaluate the psychometric properties of the instrument, Pearson correlation coefficients and Cronbach's alpha coefficients were calculated. Statistical significance was determined at $\mathbf{p < 0.05}$.

3. ETHIC APPROVAL

Ethical approval for this study was obtained from the appropriate institutional authority prior to data collection. Participation was entirely voluntary, and all participants provided informed consent before completing the questionnaire. Participants were assured that their responses would remain confidential and would be used solely for scientific research purposes. No identifying personal information was collected, and participants retained the right to withdraw from the study at any stage without any consequences.

4. RESULTS

This section presents the findings of the statistical analyses conducted to address the study objectives and test the proposed hypotheses. Descriptive statistics were used to summarize participants' demographic characteristics, while inferential statistical analyses, including one-sample t-tests, were employed to assess pregnant women's knowledge, awareness, and nutritional practices regarding iron deficiency. The results are presented sequentially according to the study variables, with emphasis placed on the most significant findings.

Participants' Demographic Characteristics

Table 8 summarizes the demographic characteristics of the study participants. Among the 52 pregnant women included in the study, the largest proportion (53.8%) were aged between 20 and 30 years, while 23.1% were younger than 20 years and an equal proportion were older than 30 years. These findings indicate that the study population primarily consisted of women within the typical reproductive age group.

Obstetric Characteristics

"Table (8) shows the frequency and relative distribution of the sample according to age, while Figure (1) presents a graphical representation of the percentage relative distribution.

Table 8 shows the frequency and percentage distribution of the study sample according to age.

Age	Number	Percentage %
Under 20 years	12	Under 20 years
20 to 30 years	28	20 to 30 years
Over 30 years	12	Over 30 years
Total	**52**	**Total**

Table 8 presents the age distribution of the study participants. More than half of the respondents (53.8%) were between 20 and 30 years of age, while 23.1% were younger than 20 years and an equal proportion (23.1%) were older than 30 years. These findings indicate that the majority of participants belonged to the typical reproductive age group, which represents the population most vulnerable to iron deficiency during pregnancy. Consequently, the sample is considered appropriate for addressing the objectives of the present study.

Table (9) shows the frequency and percentage distribution of the study sample according to the number of times.

Number of pregnancies	number	Percentage %
First time	12	%23.1
2-3 times	27	%51.9
More than 3 times	13	%25
Total	**52**	**%100**

Table 9 shows that the majority of participants (51.9%) had experienced two to three pregnancies, whereas 25.0% had more than three pregnancies and 23.1% were pregnant for the first time. Overall, the sample was predominantly composed of women with previous pregnancy experience.

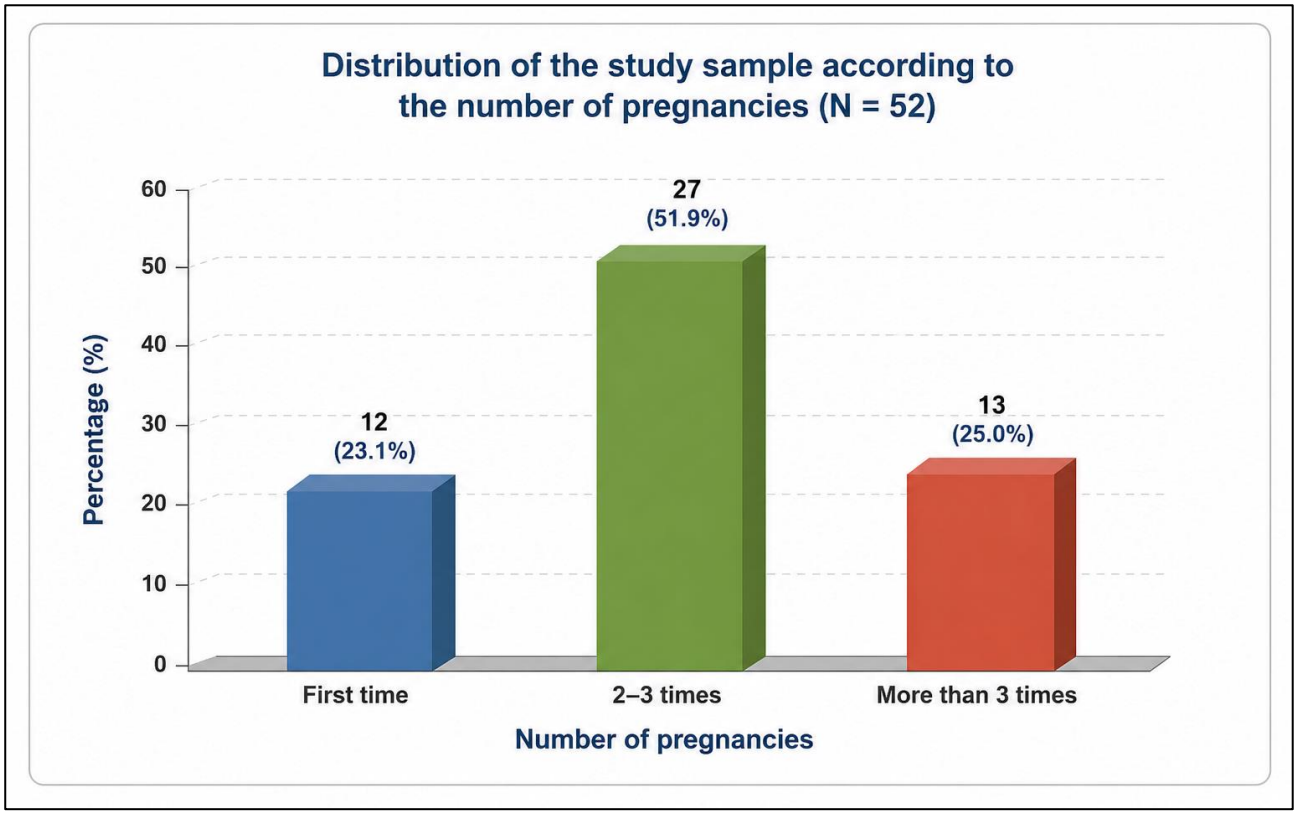

Figure (2) : The graphical representation of the study sample according to the number of pregnancies.

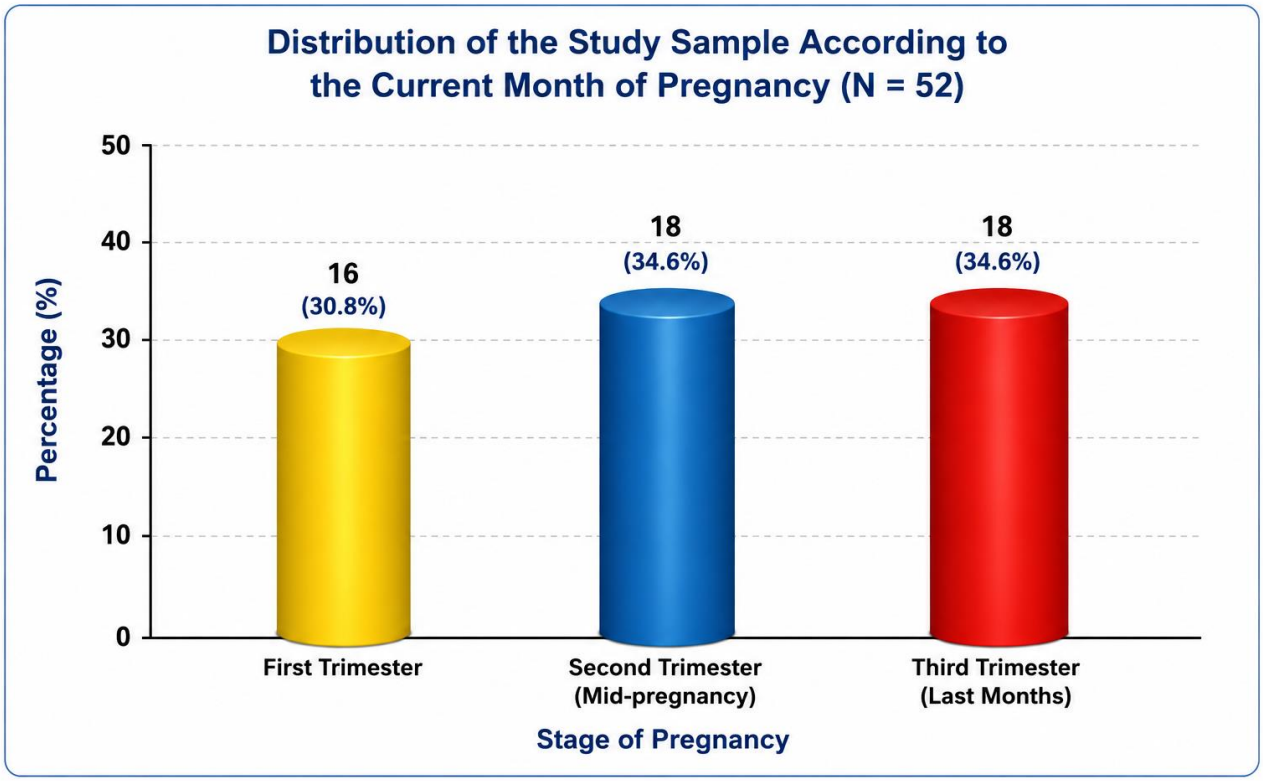

Figure (3): The graphical representation of the study sample according to the current month of pregnancy

Table (10) The frequency and relative distribution of the study sample according to the current month of pregnancy,

Percentage	number	Current month of pregnancy
%30.8	16	First months
34.6%	18	Mid-pregnancy
34.6%	18	Last months
% 100	52	the total

Table 10 presents the distribution of the study participants according to the current stage of pregnancy. The findings indicate that the participants were relatively evenly distributed across the different stages of pregnancy. The second trimester and third trimester each accounted for 34.6% (n = 18) of the study sample, while 30.8% (n = 16) of the participants were in the first trimester. This balanced distribution provides adequate representation of pregnant women at different gestational stages, thereby enhancing the comprehensiveness of the assessment of knowledge, awareness, and nutritional practices regarding iron deficiency throughout pregnancy.

Testing of data related to the study variables:

Statistical analysis was conducted for all study variables based on the responses of the study population to the questionnaire items. Means and standard deviations were calculated, taking into consideration the scale used in the study. Accordingly, the values of the obtained means were interpreted based on the following criterion for data interpretation.

Table (11): Criterion for Interpreting the Mean Scores of Respondents' Answers"

Trend of opinion	Arithmetic average
I don't know	1.00 – 1.66
I know a little	1.67 – 2.32
I know	2.33 – 3.00

Testing the Study Hypotheses"

First Hypothesis
There is awareness and knowledge of iron deficiency among pregnant women attending Al-Hurriyat Center in Zliten.

Table (12) shows the responses of the study sample to the questions related to the first hypothesis

Paragraphs	Arithmetic average	Standard deviation S	Relative weight	value T	Connot action Sig	Degree of approval
You know that iron deficiency causes anemia	2.7885	0.45747	%93	12.429	0.000	High
You know that iron affects concentration and	2.9038	0.35753	%96.8	18.230	0.000	High
Women are more prone to iron deficiency than	2.8846	0.37853	%96.2	16.852	0.000	High
Iron deficiency can cause blurred vision	2.6923	0.61160	%89.7	8.163	0.000	High
Do you believe that iron deficiency causes poor	2.8462	0.41466	%94.9	14.715	0.000	High
Do you believe that iron deficiency may cause a weakened	2.3654	0.68682	%79.5	3.836	0.000	High
You know that iron deficiency leads to delayed healing from	2.2500	0.71056	%75	2.537	0.014	Medium
Do you believe that iron deficiency affects the	2.6731	0.51340	%89.1	9.454	0.000	High

Table 12 presents the participants' responses regarding their awareness and knowledge of iron deficiency during pregnancy. Overall, the findings indicate a high level of awareness, with the majority of questionnaire items receiving high mean scores and relative weights ranging from 79.5% to 96.8%. The highest level of awareness was observed for the statement that iron affects concentration and cognitive performance (Mean = 2.90, Relative Weight = 96.8%), followed by the recognition that women are more susceptible to iron deficiency than men (96.2%) and that iron deficiency causes anemia during pregnancy (93.0%). High awareness was also reported regarding the effects of iron deficiency on physical performance, dizziness, and overall physical and mental health.

In contrast, the lowest level of awareness was associated with the statement indicating that iron deficiency may delay recovery from illnesses and wound healing (Mean = 2.25, Relative Weight = 75.0%), although this item still demonstrated a statistically significant level of agreement ($p < 0.05$). Overall, the one-sample *t*-test revealed statistically significant differences for all questionnaire items, supporting the first hypothesis that pregnant women attending Al-Hurriyat Health Center possess a satisfactory level of awareness and knowledge regarding iron deficiency.

Table (13) shows the results of the test regarding the overall mean of the study sample's responses to all Statements related to the first hypothesis.

Statement	General average	Standard deviation	Relative mean	Test statistics	Calculated semantic significance
The overall average of responses from the study sample to the statements: There is awareness and knowledge of iron deficiency among pregnant women who frequent the Al-Hawriyat Center in Zliten.	2.6907	0.29444	89.7%	16.916	0.000

Table 13 presents the overall results for the first hypothesis concerning pregnant women's awareness and knowledge of iron deficiency. The findings revealed a high overall level of awareness, with a mean score of 2.69 ± 0.29, corresponding to a relative mean of 89.7%. Furthermore, the one-sample t-test indicated that the observed mean was significantly higher than the test value ($t = 16.916$, $p < 0.001$), demonstrating a statistically significant level of awareness and knowledge among pregnant women attending Al-Hurriyat Health Center in Zliten. Therefore, the first hypothesis was supported, confirming that the study participants possessed an adequate level of awareness and knowledge regarding iron deficiency during pregnancy.

Second Hypothesis

"There is awareness of the importance of nutrition and its impact on iron deficiency among pregnant women attending Al-Hurriyat Center in the city of Zliten."

"Table (14) shows the responses of the study sample to the items related to the second hypothesis, along with the T-test values and the observed significance level (Sig)."

Paragraphs	Arithmetic average	Standard deviation S	Relative weight	value T	Connotation Sig	Degree of approval
You are using iron supplements as prescribed by a doctor.	2.3077	0.85264	%76.9	2.602	0.012	Medium
Do you believe that eating alone is enough to prevent iron deficiency without the need for supplements	1.8269	0.90144	%60.9	-1.385-	0.172	Medium
Do you believe that your current diet provides you with enough iron	1.8846	0.92150	%62.8	-0.903-	0.371	Medium
Do you believe that taking iron supplements without a prescription may cause health problems	2.5192	0.75382	%84	4.967	0.000	High

You know that pregnancy increases a woman's need for iron and therefore requires a special diet.	2.8654	0.44408	%95.5	14.052	0.000	High
You eat foods rich in vitamin C with your meals, such as oranges, tomatoes, and lemons.	2.4808	0.77940	%82.7	4.448	0.000	High
Drinking tea or coffee immediately after eating reduces iron absorption	2.8462	0.45952	%94.9	13.278	0.000	High
You should eat red meat or liver at least once a week	2.5192	0.57702	%84	6.489	0.000	High
You know that plant-based foods such as lentils and legumes contain iron.	2.7308	0.59788	%91	8.814	0.000	High
You know that excess calcium can reduce iron absorption	2.2500	0.88284	%75	2.042	0.046	Medium
You eat meals that contain fish or seafood	2.2500	0.83725	%75	2.153	0.036	Medium
You eat foods rich in calcium such as milk and cheese	2.7500	0.58995	%91.7	9.167	0.000	High
Do you believe that drinking mineral water provides the body with part of its mineral needs	2.5000	0.77964	%83.3	4.625	0.000	High
Do you believe that water affects the mineral content	2.0769	0.92559	%69.2	0.599	0.552	Medium
You know that dehydration can affect the body's ability to absorb iron	2.5385	0.80346	%84.6	4.833	0.000	High

You should drink enough water daily to maintain your overall health and absorb minerals such as iron	2.6923	0.57866	%89.7	8.627	0.000	High
	2.4174	0.34364	%80.6	8.759	0.00	High

Table 14 indicates that the participants demonstrated a high level of awareness regarding the importance of nutrition and its role in preventing iron deficiency during pregnancy, with an overall mean of 2.42 ± 0.34 and a relative weight of 80.6%. The highest levels of awareness were related to the increased iron requirements during pregnancy (95.5%) and the effect of tea or coffee on reducing iron absorption (94.9%). In contrast, relatively lower awareness was observed regarding the adequacy of diet alone to prevent iron deficiency and the contribution of mineral water to mineral intake. Overall, the findings support the second hypothesis, indicating that pregnant women possess satisfactory nutritional awareness related to iron deficiency prevention.

Table (15): presents the results of the test regarding the overall mean of the sample's responses to all items related to the second hypothesis

Statement	General average	Standard deviation	Relative mean	Test statistics	Calculated semantic significance
The overall average of responses from the study sample to the statements: There	2.4174	0.34364	%80.6	8.759	0.000

Table 15 indicates a statistically significant high level of nutritional awareness among pregnant women regarding iron deficiency prevention (Mean = 2.42 ± 0.34; Relative Mean = 80.6%; $t = 8.759$, $p < 0.001$), confirming the second hypothesis.

5. DISCUSSION

The findings of the present study revealed a high level of awareness and knowledge regarding iron deficiency among pregnant women attending Al-Horyat Center in Zliten, as indicated by the high overall mean score (2.69) and relative weight (89.7%). This reflects a strong understanding of the causes, consequences, and health risks associated with iron deficiency during pregnancy. These findings are consistent with the study conducted in Port Said, Egypt (2014), which reported a very high level of knowledge (96%) among pregnant women concerning iron deficiency anemia, its definition, symptoms, and the importance of iron supplementation. The similarity in findings may be attributed to the role of antenatal care services and continuous health education provided by healthcare professionals in both settings. Regarding awareness of the complications of iron deficiency, the majority of participants in the present study recognized its negative impact on physical performance, immune function, and maternal and fetal outcomes such as preterm delivery. This aligns with the findings of the Mansoura University study (2022), which demonstrated that pregnant women who received educational instructions showed significant improvements in knowledge and awareness, along with better health outcomes, including improved hemoglobin levels. Both studies emphasize the effectiveness of health education in enhancing maternal awareness and preventing iron deficiency anemia. Despite the overall satisfactory knowledge level, the present study identified moderate awareness regarding certain aspects, particularly the association between iron deficiency and delayed recovery from diseases. Similar gaps were reported in the Port Said study (2014), where adequate knowledge did not always translate into optimal practices. This indicates that while general awareness may be high,

specific and less obvious consequences of iron deficiency require further emphasis in educational programs. Concerning nutritional practices, the current study demonstrated good awareness of the importance of a balanced diet, iron-rich foods, and vitamin C in enhancing iron absorption, with a relative weight of 80.6%. However, inconsistencies between knowledge and actual practices were observed, especially regarding reliance on diet alone without iron supplementation and irregular use of supplements. This finding is in agreement with the Port Said study (2014), which reported moderate practice levels (65.1%) despite high knowledge, particularly in relation to proper iron supplement intake. Furthermore, the Mansoura University study (2022) supports the present findings by demonstrating that structured nutritional guidance and education not only improved knowledge and practices but also resulted in measurable physiological improvements. This highlights the importance of translating nutritional awareness into consistent and supervised health behaviors.

In conclusion, the findings of the present study are largely consistent with previous Egyptian studies, particularly those conducted in Port Said (2014) and Mansoura University (2022). Although pregnant women demonstrated satisfactory knowledge and awareness regarding iron deficiency and nutrition, a clear gap remains between knowledge and practice. This underscores the need for strengthened, structured health education programs that focus on behavioral change, adherence to iron supplementation under medical supervision, and clarification of common nutritional misconceptions to effectively prevent iron deficiency anemia during pregnancy.

CONCLUSIONS

This study assessed pregnant women's knowledge, awareness, and nutritional practices regarding iron deficiency among attendees of Al-Houriat Health Center in Zliten, Libya. The findings demonstrated that participants possessed a high level of knowledge concerning the causes, symptoms, and health consequences of iron deficiency during pregnancy. Likewise, nutritional awareness related to iron-rich foods, iron supplementation, and factors influencing iron absorption was generally satisfactory.

Despite these positive findings, the study identified noticeable gaps between knowledge and actual nutritional practices. Although most participants recognized the importance of iron supplementation and healthy dietary behaviors, moderate adherence was observed for several recommended practices, particularly those related to dietary adequacy and regular supplement use. These findings suggest that knowledge alone does not necessarily translate into appropriate health behaviors.

Overall, the study highlights the importance of strengthening maternal nutrition education within routine antenatal care. Continuous health education, individualized nutritional counseling, and regular follow-up by healthcare providers are essential to improve adherence to evidence-based nutritional recommendations and reduce the burden of iron deficiency among pregnant women in Libya. The findings also provide locally generated evidence that may assist healthcare professionals and policymakers in designing targeted interventions to enhance maternal and neonatal health outcomes.

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