



Research Article

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## ***Knowledge, Attitude and Practice Regarding Prevention of Iron Deficiency Anemia among Pregnant Women in Tabuk Region***

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### ABSTRACT

*Background: Anemia which is associated with poor maternal and perinatal outcome, is the most common medical disorder and a risk factor in pregnancy causing 20-40% of maternal deaths directly or indirectly through cardiac failure, preeclampsia, antepartum haemorrhage, postpartum haemorrhage and puerperal sepsis. Aim: The study is aimed at evaluating knowledge, attitude and practices regarding prevention of iron deficiency anemia among pregnant women attending primary health centers in Tabuk region. Methods: Descriptive design was utilized to fulfill the aim of this study. The study was conducted at eight health centers at Tabuk region. A purposive sample (N= 300) of pregnant women who attended the eight health centers at Tabuk region for receiving antenatal care was included in the study. Three tools of data collection were used; 1) self-administrated questionnaire: It includes socio-demographic data, obstetric and health history and knowledge assessment 2) modified likert scale: to assess the attitudes of pregnant women with regard to anemia prevention. 3) Practice items: to assess practice of pregnant women to prevent iron deficiency anemia. Results: The findings revealed that 25.0% of the pregnant women had history of anemia before pregnancy, 66.7% % of them had poor knowledge, and 70.0 % of them had neutral attitude toward iron deficiency anemia. And 40.0 % of them obtained poor practices score regarding prevention of iron deficiency anemia. Conclusion: The majority of pregnant women in Tabuk Region have poor knowledge, neutral attitude and poor practices regarding prevention iron deficiency anemia.*

**Key words:** Knowledge, Attitude, Practice, Prevention, Iron Deficiency Anemia.

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### INTRODUCTION

Anaemia is considered an international health problem; playing an important role in increasing morbidity and mortality among pregnant women, especially in developing countries [1]. Anemia is the lack of functioning red blood cells (RBCs) that leads to a decrease in the ability to carry oxygen causing complications during life time [2].

Women at the childbearing age are at the greatest risk, with prevalence of anemia estimates 42% in pregnant women aged 15–49 and 30% in non-pregnant women, with Africa and Asia accounting for more than 85% in high risk groups where its causes are multi-factorial [3]. According to World Health Organization (WHO), Iron deficiency is the most common nutritional problem in the world that affects about 25% of the world population, especially women in the childbearing age. As pregnant woman needs to have more red blood cells to carry oxygen around her body and her baby's, it is more common in pregnancy [4].

Iron deficiency anemia (IDA) is a disorder characterized by significant decrease of iron storing in the body as a result to extrinsic and intrinsic factors. This type of anemia is hypochromic and microcytic. High risk groups to IDA are pregnant and lactating women, elderly adults, patients with a lot amount of blood loss, individuals with nutritionally-poor diets, infants, women of childbearing age and low socioeconomic status [5, 6]. Women who had more than three children and who were older than 30 years, shorter birth spacing less than 2 years, with body mass index less than 20, decrease of antenatal care visits, decrease intake of vegetables, fruits and animal source and having intestinal parasites were positively at the high risk to anemia [7].

Iron deficiency anemia during pregnancy is accompanied with features caused by lowered oxygen delivery to the tissues that includes pallor, fatigue, depression, fainting, breathlessness, emotional instability, palpitation, headaches and hair loss. Besides, chronic IDA lowers quality of life, work tolerance and the productivity [8, 9]. Iron deficiency anemia has a major impact on the health of the woman and her fetus, it also affects cognitive and motor development [10]. Moreover, it may be associated with low birth weight of the fetus, premature labor, intrauterine growth retardation, and increased risk of maternal and prenatal mortality [11]. For reducing IDA in Saudi Arabian women, the country should make a multidimensional approach that combines iron supplementation with food fortification and by raises awareness of the food and drinks which facilitate or delay the bioavailability of iron [12]. To eradicate IDA with pregnancy certain, steps can be taken at individual and community level like education of the women as regards anemia, its causes and health implication. Instructing nutritional education, with special stress on locally available food stuff to increase the dietary intake of proteins and iron, providing suitable iron supplements and maximum compliance, deworming, treatment of chronic and parasitic disease like malaria and providing antenatal care to pregnant women will help in eradicating this serious problem [13].

Anemia in pregnant mothers needs to be tackled seriously by health care workers, especially at the primary care level because of possible health implications to the mothers and babies, though adequate iron medication were freely offered at all levels of health care facilities [14]. Emphasis should focus on pregnant women since they are especially at risk and health care providers must emphasis on teaching of pregnant women good long-term dietary habits as a part of an approach to health promotion [15]. Education and attitude of anemia in pregnant women is considerably low and can be a major cause to pregnancy related problems. So, proper awareness and educational programs regarding diet and lifestyle pattern during pregnancy can reduce the prevalence rate of anemia [16].

#### **Significance of the study:**

Anemia is a common medical disorder in pregnancy which is accompanied with poor maternal and perinatal outcome. It is one of the most important health problems among women at the age range of 18-45 in the world. Anemia during pregnancy is considered one of the main risk factors contributing to 20-40% of maternal deaths in direct or indirect way through preeclampsia, cardiac failure, antepartum hemorrhage, postpartum hemorrhage and puerperal sepsis; as well as to low birth weight which contributes to increased percentage of infant mortality in developing countries [13].

During pregnancy, severe cases of pregnant women of iron deficiency have poor outcome of neonates as low birth weight, intrauterine growth retardation, prematurity, birth asphyxia and intrauterine death [17]. Anemia in the third world affects 30% of population and IDA accounts for 75% of all types [18]. In Saudi Arabia, the country prevalence of IDA was 30–56% [19]. A hospital-based study conducted by AlQuaiz et al. Found that 37% of women are suffering from anemia in Riyadh, Saudi Arabia [20]. Also, another study by Alzaheb and Al-Amer, found that prevalence of IDA among its sample of healthy young Saudi female university students in Tabuk is 12.5% [21].

#### **Aim of the study:**

The study is aimed at evaluating the knowledge, attitude and practices regarding prevention of IDA among pregnant women attending Primary Health centers in Tabuk region

#### **Research questions:**

- What is the level of knowledge of pregnant women in Tabuk region regarding prevention of IDA in pregnancy?
- What is the attitude of pregnant women in Tabuk region regarding prevention of IDA in pregnancy?
- What are the practices of pregnant women in Tabuk region regarding prevention of IDA in pregnancy?

## SUBJECTS AND METHODS

Descriptive design was used to fulfill the aim of this study. The study was carried out at 8 Primary Health Centers (Antenatal clinic), in Tabuk region (Sulaymaniyah, Almahragan, Alworood, Almorog and Umuilj government Primary Health centers that include: Aboushagra, Alsalam, Alkebleia and Alshoab) Through simple random sampling method, 10% was taken from all health centers in Tabuk health centers. Then, through purposive sampling, 300 out of 1200 registered pregnant mothers during the previous six months attended ANC clinics in the selected previous health centers for receiving antenatal care were selected and included in the study according to the following inclusion criteria: Pregnant mothers aged 20 – 40 years, who are in the second and third trimester, normal pregnancy, without any complications (maternal and fetal complications) during pregnancy, primigravida and multipara and accepted to participate in the research. Those who have pregnancy complication such as pregnancy induced hypertension, gestational diabetes heart disease and bad obstetric history were excluded from the study.

The study sample included 300 pregnant mothers who are attending and registered in the previous mentioned setting for a period of six months. It was calculated according to the following equation

$$n = \frac{N}{1+N(e)2}$$

**Tools of Data Collection:** Three tools were used for collecting data

**I- Self-administrated questionnaire:** It was developed by the researchers in Arabic language after reviewing related literature. It involved two main parts:

**Part (1):** Socio-demographic data as (age, residence, monthly income, level of education, occupation, and current obstetrics and health history).

**Part (2):** Assessment of the knowledge of pregnant women regarding IDA as (definition, sign and symptoms, causes and complications, prevention, etc.).

The scoring system for knowledge was calculated for each item as follows: correct answer was scored (two points), the incomplete answer was scored (one point), while unknown or incorrect answer was scored (zero). The total score for all questions related to knowledge was considered good if  $\geq 75\%$ , average if the score  $50- < 75\%$  and poor if less than  $50.0\%$ .

**II- Modified likert scale:** To assess the attitude of pregnant women at Tabuk region regarding the prevention of IDA. The scale consisted of 10 statements about several issues related to IDA and its prevention. The items were rated on 5-point Likert scale ranged from 1 (strongly disagree) to 5 (strongly agree). The total attitude score ranged from 10 to 50. The participant is considered to have negative attitude if her score ranged from 10-23, neutral attitude if her score ranged from 24-37 and positive attitude if her score is more than 37.

**III- Practices of pregnant women toward IDA:** To assess the practice of pregnant women to prevent IDA (through asking 7 closed ended questions), each item was scored 1 if the answer is (yes) and Zero if the answer is (No). The total practices score were considered good if the percent score was  $\geq 75\%$  and average if the percent score  $50- < 75\%$  and poor if less than  $50\%$ .

A written official approval to conduct this research was obtained from the responsible authorities of primary health centers and ethical approval was received from the Ethics Committee of Tabuk University to conduct the study after explaining its purpose.

Reliability was estimated by using Cronbach's Alpha coefficient test which revealed that each of the three tools consisted of relatively homogenous items as indicated by the high reliability. An internal consistency of tool I = 0.81, tool II = 0.85 and tool III = 0.73 was obtained.

**Ethical Considerations:** Permission was obtained orally from each woman before conducting the interview and after giving a brief orientation to the purpose of the study. The women were reassured that all the collected data are confidential and used only for the purpose of the study. They were also informed about their right to withdraw at any time from the study without giving any reasons and that the study will not have any physical, social, or psychological risks.

**Pilot study:** It was carried out on 10 % of the sample (30 pregnant women). It was excluded from the main study sample. The main purpose was to test the relevance and applicability of the tools.

**The Procedures:** The previous mentioned settings were visited by the researchers two days/week during antenatal visits of pregnant women. The researchers interviewed each woman after ensuring her health status, explained the aim of the study, and asked for participation. Upon consent to participate, women were asked to fill the questionnaire. Average time for the completion of questionnaires was 25-30 minutes.

**Statistical Analysis:** Data analysis was performed using Statistical Package for Social Sciences (SPSS version 20.0). Descriptive statistics were used to describe the characteristics of the study subjects (e. g. frequency, percentages, mean, and standard deviation).

## RESULTS

**Table 1:** Distribution of the studied women according to their demographic characteristics (n = 300)

Characteristics	No	%
<b>Age</b>		
less than 20	13	4.3
20-30	173	57.7
31-40	114	38.0
<b>Mean <math>\pm</math> SD</b>	25.47 $\pm$ 5.54 years	
<b>Residence</b>		
Urban	174	58.0
Rural	126	42.0
<b>Monthly income</b>		
Sufficient	255	85.0
Insufficient	31	10.3
Sufficient and save	14	4.7
<b>Level of education</b>		
University education	130	43.3
Above secondary education	50	16.7
Secondary education	43	14.3
Read and write	77	25.7
<b>Occupation</b>		
Working	41	13.7
Housewife	259	86.3

**Table (1)** shows demographic characteristics of the studied women. It was clear that 57.7% of the subjects were aged from 20-30 years, with a mean of age 25.47 $\pm$ 5.54 years. With regard to their residence, 58% of them were urban areas residence. Furthermore, 85% of them had sufficient monthly income and 43% of them had university education. In addition, 86.3% of them were housewives.

**Table 2:** Distribution of the studied women according to their obstetrics and health history (n = 300)

Characteristics	No	%
<b>History of anemia before pregnancy</b>		
Yes	75	25.0
No	193	64.3
Don't know	32	10.7
<b>Gravida</b>		
1 <sup>st</sup>	87	29.0
2 <sup>nd</sup>	80	26.7
3 <sup>rd</sup>	60	20.0
4 <sup>th</sup>	72	24.0
5 <sup>th</sup>	1	3.3
<b>Duration of pregnancy</b>		
First trimester	62	20.7

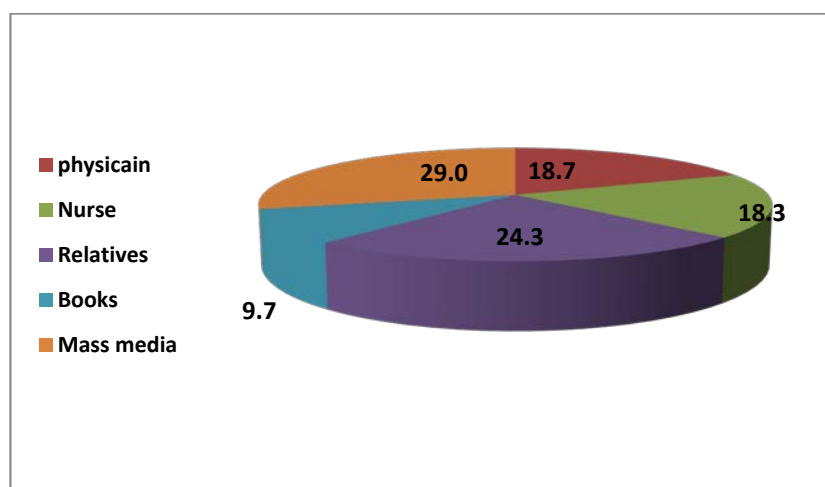
Second trimester	140	46.7
Third trimester	98	32.7
<b>Vomiting during pregnancy</b>		
Yes	189	63.0
No	111	37.0
<b>Pregnant with twins</b>		
Yes	33	11.0
No	267	89.0
<b>Gastrointestinal disease during pregnancy</b>		
Yes	123	41.0
No	177	59.0

**Table (2)** clarifies obstetrics and health history of the studied women. It was clear that 64% of the studied women had history of anemia before pregnancy and 29% of the women were primigravida, also 46.7% of them in the second trimester of pregnancy. In addition, 63% and 59% of them were suffering from vomiting and gastrointestinal disease during pregnancy respectively. Only 11.0% of them were in twins' pregnancy condition.

**Table 3:** Percent distribution of the study subjects according to their knowledge regarding IDA (n=300)

Items	Unknown or incorrect		Incomplete answer		Correct answer	
	no	%	no	%	no	%
Definition of IDA	163	54.3	137	45.7	0	0.0
Signs and Symptoms of IDA	108	36.0	148	49.3	44	14.7
Causes of IDA	117	39.0	169	56.3	14	4.7
Complication of IDA on mother and fetus	157	52.3	137	45.7	6	2.0
Tests to diagnose IDA	171	57.0	129	43.0	0	0.0
Ways of prevention	102	34.0	177	59.0	21	7.0
Foods that contain high iron content	99	33.0	191	63.7	10	3.3
Foods that inhibit iron absorption	122	40.7	166	55.3	12	4.0
Foods with high vitamin C content	77	25.7	208	69.3	15	5.0

**Table (3)** illustrates the percent distribution of the study subjects according to their knowledge regarding IDA. It was found that 69.3%, 55.3%, 63.7%, 59.0% and 56.3% of the studied subjects had incomplete answer regarding food with high vitamin C content, food that inhibit iron absorption, food that contain high iron content, ways of prevention and causes of IDA respectively. Only 2.0% of them had a correct answer about complication of IDA on mother and fetus and no one had correct answer about definition of IDA or tests to diagnose IDA.



**Figure 1:** Distribution of the studied subjects according to their sources of knowledge about IDA (n = 300)

Fig. 1 clarifies the distribution of the studied subjects according to their sources of knowledge about IDA. It was clear that, 29.0% of the studied subjects receive their information about IDA from mass media. Only 9.7% of them receive their information from books.

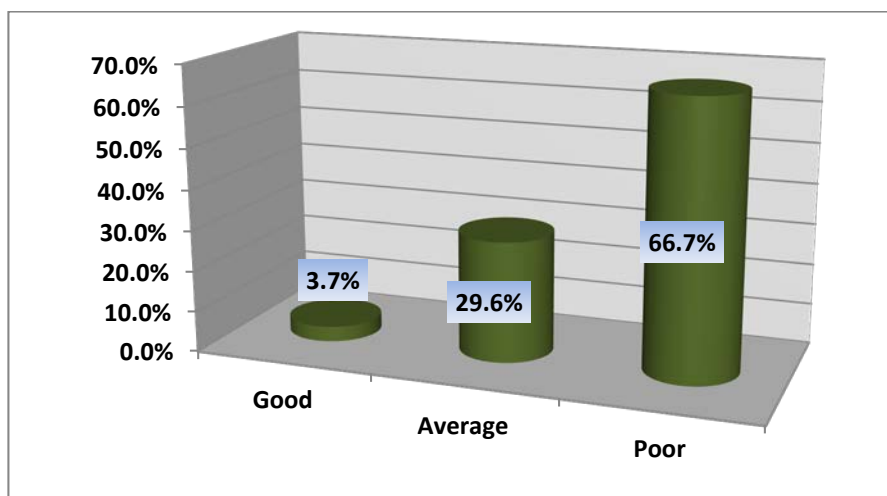


Figure 2: Distribution of the studied subjects according to their total knowledge score regarding IDA (n = 300)

Fig. 2 clarifies the distribution of the studied subjects according to their total knowledge score. It was clear that, 66.7% of the studied subjects had poor knowledge regarding IDA. Only 3.7 0% of them had good knowledge.

Table 4: Distribution of the study subjects according to their attitude regarding prevention of IDA (n=300)

Items	Strongly agree		Agree		sometimes		disagree		strongly disagree	
	No	%	No	%	No	%	No	%	No	%
IDA during pregnancy is a serious problem	7	2.3	26	8.7	70	23.3	120	40.0	77	25.7
IDA makes the woman unable to work	6	2.0	22	7.3	109	36.3	106	35.3	57	19.0
Space between pregnancy and other reduces the risk of anemia	8	2.7	30	10.0	112	37.3	87	29.0	63	21.0
IDA is the end of the pregnant woman	28	9.3	91	30.3	106	35.3	48	16.0	27	9.0
All pregnant mothers must have anemia	19	6.3	79	26.3	143	47.7	43	14.3	16	5.3
Search for information about IDA	12	4.0	57	19.0	105	35.0	58	19.3	68	22.7
The pregnant woman should perform regular checkup	11	3.7	22	7.3	88	29.3	81	27.0	98	32.7
Iron is important in food	8	2.7	24	8.0	100	33.3	117	39.0	51	17.0
IDA can be prevented during pregnancy	7	2.3	24	8.0	87	29.0	114	38.0	68	22.7
It is difficult to treat anemia	20	6.7	44	14.7	92	30.7	91	30.3	53	17.7

Table (4) shows the distribution of the study subjects according to their attitude regarding IDA. It was found that 7.3% agree that IDA makes the woman unable to work and that the pregnant woman should perform regular checkup. Also, 8.0% agree that IDA can be prevented during pregnancy and iron is important in food. In addition, 25.7% of them strongly disagree with the statement “IDA during pregnancy is a serious problem ”.

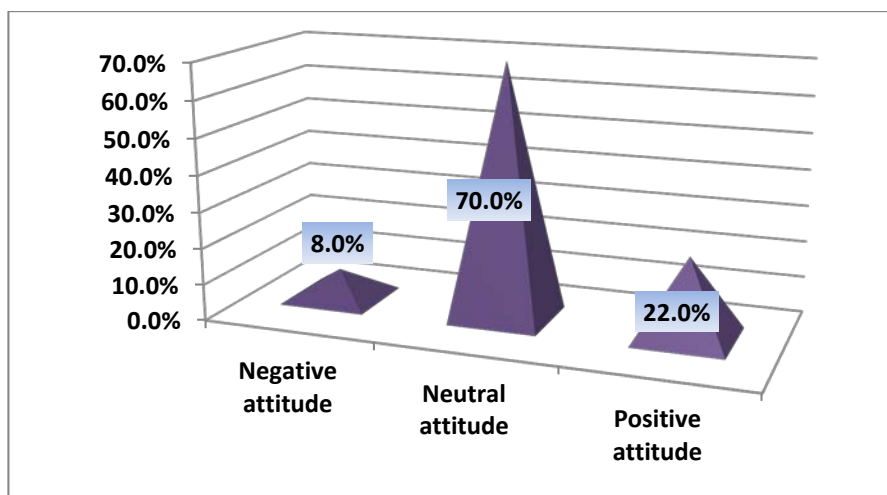


Figure 3: Distribution of the studied subjects according to their total attitude score regarding IDA (n = 300)

Fig. 3 illustrates the distribution of the studied subjects according to their total attitude score. It was clear that, 70.0% of the studied subjects had neutral attitude regarding IDA and 8.0% of them had negative attitude regarding IDA.

Table 5: Distribution of the studied women according to their practices to prevent IDA (n = 300)

Items	Yes		No	
	No	%	No	%
Regular antenatal visit	160	53.3	140	46.7
Take the iron supplement	123	41.0	177	59.0
Eat fruits containing vitamin C	91	30.3	209	69.7
Eat meat, poultry and fish	21	7.0	279	93.0
Eat vegetables such as cabbage and watercress	45	15.0	255	85.0
Eat fruits such as apples, dates, grapes and mango	50	16.7	250	83.3
Avoid drinking tea and coffee after eating continuously	134	44.7	166	55.3

Table (5) displays the distribution of the studied subjects according to their practices to prevent IDA. It was found that 53.3% of the studied subjects make regular antenatal visit and only 7.0%, 15.0%, 16.7%, 30.3% of them eat meat, poultry and fish, eat vegetables such as cabbage and watercress, eat fruits such as apples, dates, grapes and mango, and eat fruits containing vitamin C, respectively.

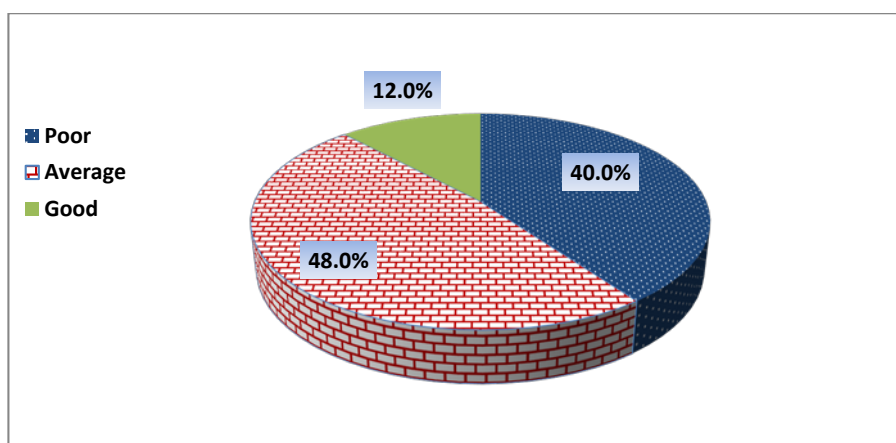


Figure 4: Distribution of the studied subjects according to their total practices score regarding IDA (n = 300)

Fig. 4 represents the distribution of the studied subjects according to their score regarding IDA. It was clear that, 40.0% of the studied subjects obtained poor practices score regarding IDA. Only 12.0% of them obtained good practices score.

## DISCUSSION

Iron deficiency anemia is a global health problem as it ranks in the top-20 causes of disability-adjusted life-years lost, ahead of tuberculosis [2]. It is a main cause of morbidity for women of reproductive age, but little is known about knowledge, attitudes and practices related to screening for and management of this problem. This study provides insight into the knowledge, attitude and practices regarding prevention of IDA among pregnant women attending primary health centers in Tabuk region.

According to Alflah et al. [22] the risk of IDA anemia increased with the gravidity, decreased birth spacing, gestational age, drinking tea and coffee after meals, and decreased intake of proteins and low level of knowledge and income. Alghamdi [23] recommended that increasing the efforts toward the educational interventions of women in reproductive age regarding the preconception counseling and adequate intake of iron-rich food sources, iron and folic acid supplementation and early detection and treatment the anemia before childbirth.

The present study findings indicated that 11.7% of the study participants had a history of IDA before pregnancy and nearly half of them were in the second and third pregnancy. This result is in accordance with a previous study carried out in Saudi Arabia by Enrera et al. [24] entitled "IDA among pregnant women" which stated that, about one quarter (25%) have a history of anemia before pregnancy and Okube et al. [25] who had showed that about half of their study participant were in the second and third pregnancy.

The present study findings illustrated that less than half of the pregnant women had gastrointestinal disease during pregnancy. This result is compatible with Ahamed et al., [26] who had studied "knowledge and attitude of pregnant women about IDA in Assuit, Egypt" found that more than two thirds of their study subjects had gastrointestinal disease during pregnancy and this put the pregnant women at a risk for IDA.

The present study findings also revealed that the most of the study subject receive their information about IDA from mass media on the other hand. With regard to the issue, Tashara et al. [27] found that the most of the studied subjects receive their information about IDA from health worker. This conflict in results may be attributed to the difference in the nature of the target population in terms of age and setting of the study.

Concerning the pregnant women knowledge toward IDA, this study revealed that, two thirds of the pregnant women had poor knowledge regarding IDA. Only 3.7 0% of them had good knowledge. These results is in the same line with Sonkar et al., [28] who indicated that there was a lack of study subjects' knowledge regarding anemia. Moreover, it was mentioned by Tashara et al. [27] that the women of reproductive age have inadequate knowledge on IDA and its prevention. Thus, creating awareness among pregnant women through the implementation of health education program regarding diet rich in iron, importance of regular intake of iron supplementations, and complications of anemia during pregnancy will prevent or at least reduce the incidence of IDA and thereby the maternal mortality [29].

These findings also agree with at least four other researches. First, Ghimire and Pandey, [30] who had found that the mothers who delivered at University hospital did not have adequate knowledge regarding the prevention of anemia and sources of iron containing foods. Second Ibrahim et al. [31] who had pointed out that the studied pregnant women had deficient knowledge below the average level about IDA before the intervention based on health belief model. Third Shanthini and Nivedita, [32] who had indicated the lack of knowledge regarding anemia, iron rich foods and the importance of iron supplementation during pregnancy. Fourth Balasubramanian, et al., [29] who had found that there was knowledge deficiency among antenatal mothers regarding anemia and its complications.

On the contrary, Theng et al. [33] found that the high level of knowledge on consumption of iron supplement among pregnant women in Kuala Terengganu and it was due to the point that the pregnant women had the higher education.

It was clear from the current study that, more than two thirds of the pregnant women had neutral attitude regarding IDA, and only 22.0% of them had positive attitude. This result was in agreement with Margwe, et al., [14] who had found that 38% of their studied women had unfavorable attitude toward IDA which indicates the need to sustain campaigns for health education and awareness creation among pregnant women. Also, Angadi et



al. [34] had documented poor attitude toward anemia among adolescent girls in Karnataka. Moreover, Jalambo et al., [35] found that most female students have undesirable attitude and practice toward IDA.

On the contrary, Shahzad et al. [36] had documented that more than half of their studied subjects had good knowledge about IDA anemia and more than three-quarters of them had positive attitude towards self-awareness of IDA anemia as a disease. Furthermore, previously mentioned study by Ahamed et al. [26] found that about four fifth of the studied women had positive attitude toward anemia. This conflict in results is due to social, cultural and educational differences between the study subjects.

On the other hand al-humaidi et al. [37] who had studied "attitude and practice towards anemia among Saudi university students", reported different results. Good attitudes were found among university students towards anemia which was due to addressing an educated class, university students in Saudi Arabia.

Concerning the practices toward prevention of IDA, the present study showed a poor practice among the studied women. Only 12.0% of them obtained good practices score as more than half of the pregnant women never take iron supplement. This result was supported by previously mentioned research by Enrera et al. [24] who had stated that there is a need for iron supplement for pregnant women in order to prevent the occurrence of IDA. Also, Rasheed et al. [38] in their study at Al Khobar in Saudi Arabia recommended the implementation of educational intervention at the primary health care centers to address the importance of iron supplementation along with sufficient intake of iron-rich food sources during pregnancy and postpartum period. In addition Raksha and Shameem [39] study in Mangalore, India, found poor practice among most of the child bearing women. Moreover, Okube et al. [25] documented that special care should be given for pregnant women during pregnancy to prevent IDA anemia. Nutritional education on consumption of more diversified and additional meal and iron-rich foods and iron/folate supplementation are suggested to prevent ADI anemia. Moreover, a study by al-humaidi et al. [37] documented that there was a poor practice towards IDA among pregnant women.

On the contrary, Theng et al. [33] had documented that, most of their studied subjects consumed iron supplement 77.5% while only 22.5% of pregnant women did not intake iron supplement during pregnancy. Furthermore, Sivapriya and Parida, [40] found that 59.5% of antenatal women were following good practices to prevent anemia in pregnancy. This incongruity between the current study and latter studies might be attributed to the social and cultural differences. Therefore, to raise the awareness of pregnant women and improve their practices to prevent IDA, emphasis should be made on educational programs and continual evaluation of their knowledge, attitude and practices.

## CONCLUSION

Based on the results of the present study, it can be concluded that, the majority of pregnant women in Tabuk region have poor knowledge, neutral attitude and poor practices regarding prevention of IDA.

### Recommendations

- Health education programs are important for pregnant women to improve their knowledge, attitude and practices toward prevention of IDA during pregnancy.
- Providing the pregnant women at antenatal clinics with educational materials to improve their knowledge, and practices
- Replication of the present study on larger samples, and different settings.

### Conflict of interest

The authors declare that they have no competing interests.

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