

## Pregnant women knowledge of nutritional iron deficiency anemia in Al-Baha area

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**Abstract:**-Iron deficiency (ID) is the leading single nutrient deficiency in the world. Maternal IDA has been linked to higher risk of low birth weight, preterm delivery and infant IDA, which in turn can permanently impair intelligence, motor and behavioral development, and increase risk of future IDA in the offspring. During pregnancy, the maternal body requirement for iron increases to approximately 1000 mg on average. The aims of this study are to determine how is the knowledge of participants toward the risk of iron-deficiency anemia. And the effect of education and occupation in total knowledge of participants. This study was done in 5 Primary healthcare centers (PHCs) in Al-Baha area over two weeks from 24th April to 6th of May 2016. 66 pregnant patients were recruited and participated. Participants were from all parts of the community. This study exposed a defect in the health policy and defect in the education of women in the area. Iron supplementation for pregnant women should be individualized according to their iron status. Appropriate diet education is needed for pregnant women so that they can consume adequate amounts of iron from food and supplements.

**Keywords:**Iron deficiency anemia, Nutrition, AlBaha, Primary healthcare center, Iron supplementation, Diet education

### I. INTRODUCTION

The human body needs iron for many vital physiological functions including oxygen transport, hemoglobin and myoglobin synthesis, enzyme functions, cell growth and function(1-3). Iron balance in the body is determined by several factors including iron intake and absorption, iron loss and iron stores(1, 2, 4). Inadequate iron intake through diet or supplements enhances dietary iron absorption, mobilizes iron stores, reduces iron transport to bone marrow, lowers hemoglobin (Hb) levels and eventually leads to Iron deficiency anemia (IDA)(5-7).Iron deficiency (ID) is the leading single nutrient deficiency in the world(2, 8).In pregnancy IDA is defined by Hb less than 110g/l in first trimester, less than 105g/l in second and third trimesters and less than 100g/l in postpartum period(3, 9, 10). Therefore, prevalence of IDA in expectant mothers affects nearly half of all pregnant women worldwide. Maternal IDA has been linked to higher risk of low birth weight, preterm delivery and infant IDA, which in turn can permanently impair intelligence, motor and behavioral development, and increase risk of future IDA in the offspring(3, 5, 6, 9). Since preterm delivery, fetal growth restriction and low birth weight are known causes of infant mortality, supplementation with iron, or iron-folic acid, if beneficial, might also be expected to increase infant survivorship(11-14).It is clear that neonatal iron stores can be compromised when the mother is iron deficient or anemic(4, 14, 15). For example, under steady state conditions serum ferritin concentration correlates with total Body iron stores. New born infants from iron deficient mothers with low serum ferritin levels also had low serum ferritin indicating there is a limited capacity for the fetus to accumulate iron from low maternal stores(1, 8, 9, 16). Added to that, maternal IDA will result in offspring that are more likely to develop iron deficiency in the future regardless of adequate nutrition(3, 9). Recently, Pica behavior in pregnancy (ingesting cleaning products, couch stuffing, vacuum powder, chalk, and sponges) was strongly associated with iron deficiency, which by itself is known to affect birth outcomes during pregnancy(5, 8). During pregnancy, the maternal body requirement for iron increases to approximately 1000mg on average. Of this 350 mg is associated with fetal and placental growth, 500 mg with expansion in the red cell mass and 250 mg with blood loss at delivery(7, 11). The increased requirement needs to be supported by higher maternal iron intake increasing from 6 mg/din the 1st trimester, to 19 mg/day in the 2nd trimester to 22 mg/day in the 3rd trimester of pregnancy. Iron supplementation during pregnancy increases maternal iron status and stores(11, 12). It is plausible that iron supplementation improves pregnancy outcome when mother is anemic. A poor maternal diet resulting in anemia is unlikely to occur in isolation and effects may not be correctable by a brief period of supplementation(4, 8, 14, 16). Iron supplements may need to be started before pregnancy and continued throughout the reproductive years in order to reduce the risk of adverse pregnancy outcomes and to improve the iron stores of the infant(2, 3, 8). In Saudi Arabia, nutrition is one of the important high risk factors of IDA among Saudi women during pregnancy(1, 8, 13, 16). Unfortunately, the prevalence of IDA during

pregnancy in Saudi Arabia is getting higher. Antenatal care (ANC) centers play an important role in order to implement healthy nutrients for pregnant women. And this is obviously happened when there are more education and support during ANC visits for pregnant women(6, 7, 10). The knowledge of pregnant women about the dietary habits during pregnancy and its impact on fetal health defers according to the level of education(1, 10, 16). The aims of this study are to determine how is the knowledge of participants toward the risk of iron-deficiency anemia. And the effect of education and occupation in total knowledge of participants.

## II. METHODS

This study was carried out in Primary healthcare centers (PHC) in Al-Baha area from 5 PHCs out of 17 in the area. These PHCs were chosen due to easy access and they are the largest in the area. These are Banifarwa, Alzhfair, Baljurashi, Bansialem and Al-Baha PHCs. Study was conducting between 24th April and 6th of May 2016. A special form was prepared to extract data from pregnant women visiting the PHCs. They were informed about the study, its benefits in the area and how they would be anonymous. If a patient willing to participate a signed consent is collected from each one. They receive the simple questioner form to answer and returned to the researcher again at the same sitting. This study was approved by Al-Baha University Medical College Ethical Committee. Outcomes include demographic characteristics of the participants (age, occupation, education, gestational age at time of survey and number of children), history of previous abortion, history of bleeding during current pregnancy, knowledge of the risk of IDA, knowledge of the need of pregnant to extra amount of food, knowledge about foods rich in iron and the ones that affect its absorption, knowledge of the importance of hemoglobin measurements, patient last measured hemoglobin, foods that she took during pregnancy that affect iron, the use of vitamins during pregnancy, spacing between pregnancies and age at first pregnancy. Simple statistics was used and data was presented as numbers and percentages.

## III. RESULTS

This study was done in 5 PHCs in Al-Baha area over two weeks from 24th April to 6th of May 2016. 66 pregnant patients were recruited and participated. Participants were from all parts of the community, there demographic characteristics can be seen in Table 1.

**Table 1: Participants demographic characteristics**

Parameter	Number of participants	Percentage
<b>Age</b>		
less than 20 years	7	10.6%
20 - 34 years	24	36.4%
35 or more	35	53%
<b>Education</b>		
Illiterate	8	12.1%
Primary/ secondary	12	18.2%
High school	17	25.8%
University/above	29	43.9%
<b>Occupation</b>		
Housewife	28	42.4%
Teacher	28	42.4%
Health care provider	4	6.1%
Others	6	9.1%
<b>Gestational age</b>		
First Trimester	23	34.8%
Second Trimester	19	28.8%
Third Trimester	24	36.4%
<b>Number of children</b>		
Nullipara	6	9.1%
1- 4	38	57.6%
5 or More	22	33.3%

Patients were asked about history of abortions before and if they have bleeding during current pregnancy, Table 2.

**Table 2; history of previous abortions and bleeding in current pregnancy**

Parameter	number	percentage
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<b>History of previous abortion</b>		
Yes	31	47%
No	35	53%
<b>Number of previous abortions</b>		
Never	35	53%
1 time	19	28.8%
2-3 times	9	13.6%
More than 3	3	4.5%
<b>History of bleeding in current pregnancy</b>		
Yes	12	18.2%
No	54	81.8%

Patients were asked about current and previous pregnancies and spacing and their knowledge on its benefits, Table 3.

**Table 3: Pregnancy and spacing**

Parameter	Number	Percentage
<b>Age at first pregnancy</b>		
Less than 18 Years	13	19.7%
18 -25 Years	44	66.7%
26 -33 Years	9	13.6%
<b>Number of previous pregnancies including current</b>		
1-3 Pregnancies	29	43.9%
4-6 Pregnancies	25	37.9%
More than 6 Pregnancies	12	18.2%
<b>Average time between births participant have</b>		
Less than one Year	28	42.4%
1- 2 Years	24	36.4%
More than 2 Years	14	21.2%
<b>Time between previous and current pregnancy</b>		
Less than one Year	27	40.9%
1-2 Years	25	37.9%
3 Years or More	14	21.2%
<b>Is spacing beneficial for participants health</b>		
Yes	59	89.4%
No	7	10.6%

Patients were asked about their hemoglobin, if they consider its measurement important and if they consider antenatal care important, Table 4.

**Table 4: Participants hemoglobin and antenatal care**

Parameter	Number	Percentage
<b>Did participants considered measuring her Hemoglobin important</b>		
Yes	62	93.9%
No	4	6.1%
<b>Knowledge of her latest hemoglobin measurements</b>		
Less than (8) g/dl	15	22.7%
Between (8 -11.9) g/dl	29	43.9%
More Than (12- 14.9) g/dl	11	16.7%
15 g/dl or more	3	4.5%
Do not Know	8	12.1%
<b>Did participants consider Antenatal Care important</b>		
Yes	59	89.4%
No	7	10.6%

Participants were asked about their food and the ingestion of iron supplements, Table 5.

**Table 5: participant's food and iron supplement**

Parameter	Number	Percentage
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Food types she took in the last two days		
Contained Iron and Vit C	50	75.8%
Did not Contained any Iron or Vit C	16	24.2%
If the food she took during pregnancy good for her child health		
Yes	60	90.9%
No	6	9.1%
Is taking iron supplement during pregnancy benefit her baby		
Yes	63	95.5%
No	3	4.5%
Is she taking iron supplement during pregnancy		
Yes	42	63.6%
No	19	28.8%
Some times	5	7.6%
Is it usual for her to drink tea after eating		
Yes	29	43.9%
No	37	56.1%

Participants were asked about their knowledge of iron and foods rich in iron, Table 6.

**Table 6: Knowledge of participants of iron and foods rich in iron**

Parameter	Number	Percentage
Knowledge of the types of food that contain iron		
Good	22	33.3%
Fair	23	34.8%
Poor	21	31.8%
The food containing iron useful for pregnant mothers	57	86.4%
Yes	9	13.6%
No		
Knowledge of the effect of vitamin C on iron absorption		
Knows	46	69.7%
Did Not Know	20	30.3%
Knowledge of the effect of drinking tea on iron's absorption		
Knows	42	63.6%
Did Not Know	24	36.4%
Knowledge of What are the types of food that a pregnant woman who suffers from anemia need		
Good	20	30.3%
Fair	28	42.4%
Poor	18	27.3%
Knowledge of What are the most important foods rich with irons		
Good	22	33.3%
Fair	30	45.5%
Poor	14	21.2%
Knowledge of the most important foods pregnant woman needs		
Good	26	39.4%
Fair	35	53.0%
Poor	5	7.6%
Knowledge of why pregnant women needs additional food		
Good	14	21.2%
Fair	44	66.7%
Poor	8	12.1%
It is necessary to continue taking nutrient-rich element with irons during lactation		
Yes	56	84.8%
No	10	15.2%

#### **IV. DISCUSSION**

This research was conducted in Al-Baha area, Saudi Arabia. This area is mainly populated by original Saudi Citizens, and mostly they belong to the main two large tribes (Families) in the area. Most of the men in the area are in the army after high school or highly educated. On the other hand, most of the women in the area finished high school and some finished college degree. Also, some of the residents in the area not educated or illiterate. Not all residents believe in medical treatment and sometimes they believe in shaman. Added to that, still some women in the area very shy to go to a mall doctor. We recruited 66 participants from the PHC in the area, this give us participants from all levels and classes of the community in the area, and this is a strong point in our research. The aim of this research was to evaluate the knowledge of pregnant women in the area on the importance of iron in pregnancy and the importance of having foods rich in iron during pregnancy for the mother and fetus health. Since PHC are the principle in antenatal care it was the best place to recruit participants from there. Also, health education for patients is best done during antenatal visits, and this research may reflect the level of education process done. On the other hand, the level of education of participants will affects the level of understanding of the advices and education given to the patients and this will be reflected on the level of knowledge of the participants(1, 7, 16). From Table 1 we can see that most of the women were middle aged high school or higher educated persons. And, it is apparent from the basic characteristics of the participants they are mainly house wives and teachers, they are mainly multipara. Added to that, most of the participants have never had an abortion and have no problems in this pregnancy, Table 2 In Table 3, most of the participants believe that spacing between pregnancies is beneficial for their health but also they believe that one year or less is enough for spacing. They know that measuring hemoglobin during pregnancy is important but most of them are anemic, Table 4. In Table 5, it is apparent that most of the food intake of the participants contains iron and vitamin C while minority drink tea after food. On the other hand, on Table 6, it is apparent that, they know good information on iron, vitamin C and Tea but their information is not good enough since they do not know enough on foods that contain iron and vitamin C. This research exposed an important defect in the health education of these women in the PHC, namely nutritional education. This defect can be changed by giving specific classes for pregnant women to educate them including nurses, midwives and dietitians. Or, especially women at high risk of IDA can be referred to dictation to educate them and may put diet plan for these women.

#### **V. CONCLUSION**

This study exposed a defect in the health policy and defect in the education of women in the area. Iron supplementation for pregnant women should be individualized according to their iron status. Appropriate diet education is needed for pregnant women so that they can consume adequate amounts of iron from food and supplements. Larger scale researches are needed in the area to expose this defect and to show the importance of health and dietary education in Al-Baha area.

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