



# THE NUTRITIONAL ANAEMIA AND ITS RELATION BY THE EATING OF CHEESE OR YOGURT AMONG PREGNANT WOMEN IN ELOBIED CITY, WEST OF SUDAN

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## ABSTRACT

**BACKGROUND:** This study was conducted at the Obstetrics and Gynecological Hospital in Elobied City - North Kordofan State, West of Sudan, in the period from December 2017 to December 2019, to detect the presence of nutritional anaemia among pregnant women, and to study the relation between the presence of anemia and eating the cheese or yogurt with the meal among the pregnant women.

**METHODS:** Systematic random sampling method was used to select 384 pregnant women. Data were collected by questionnaire and a blood samples were taken from all women chosen and analyzed by Mindray Haematology Analyzer to measure the hemoglobin level to detect the presence of anaemia. The data of questionnaire were analyzed by SPSS and the results presented in tables and figures showing the percentages. The Chi-square test (McNemar's test) was used to find the relation between the presence of anaemia and eating of cheese or yogurt.

**RESULTS:** Most pregnant women (75%) were have anemia. Most pregnant women (61.5%) were eating cheese or yogurt with the nutritional meal. Conclusion: The study discovered that there is a relation between eating of cheese or yogurt with the meal and the presence of anaemia, where the eating of cheese or yogurt with the meal contributed to the presence anemia with 45.1%. This study recommended the pregnant women to eat cheese or yogurt with separate time of nutritional meal (not with the meal).

## INTRODUCTION

Anaemia, defined as a decreased concentration of blood hemoglobin, is one of the most common nutritional deficiency diseases observed globally and affects more than a quarter of the world's population [1]. Anaemia is a major cause of morbidity and mortality of pregnant women and increases the risks of foetal, neonatal and infant mortality [2].

Anaemia during pre g-nancy contributes to 20% of all maternal deaths [3]. Iron deficiency is the cause of 75% of anaemia cases during pregnancy [4]. According to UNICEF [5] the causes of iron deficiency are: too little iron in the diet, poor absorption of iron by the body, and loss of blood (including from heavy menstrual bleeding). It is also caused by lead poisoning in children. Nutritional



Anaemia develops slowly after the normal stores of iron have been depleted in the body and in the bone marrow. Women, in general, have smaller stores of iron than men and have increased loss through menstruation, placing them at higher risk for nutritional anaemia. High-risk groups include: women of child-bearing age who have blood loss through menstruation; pregnant or lactating women who have an increased requirement for iron; infants, children, and adolescents in rapid growth phases; and people with a poor dietary intake of iron through a diet of little or no meat or eggs for several years.

**Source of iron:** Non-vegetarian dietary sources of iron are red meat, fish, liver, and egg yolks; vegetarian sources include lentils and beans, whole grains and products made from these foods [5].

**Forms of iron:** There are two forms of iron, haem-iron and non-haem iron. Haem-iron is better absorbed than non-haem iron. Foods rich in haem-iron are liver, meat, poultry and fish. Foods containing non-haem iron are those of vegetable origin, e.g., cereals, green leafy vegetables, oilseeds, and dried fruits. The bioavailability of non-haem iron is poor owing to the presence of phytates, oxalates, carbonates, phosphates and dietary fibre which interfere with absorption. (6) iron

**Calcium:** As published by Tidehag (7) : Calcium has been shown to inhibit iron absorption in both rats and man. Giving 165 mg Ca as milk, cheese or calcium chloride reduced absorption by 50-60% . Calcium inhibits the absorption of both heme and nonheme iron.

**Sources of calcium:** The milk and milk products like yogurt and cheese are the richest sources of calcium. The presence of large quantities of calcium in nutritional meal is conflicted with iron absorption [8]

**objectives:** To detect the presence of nutritional anaemia among pregnant women, and to study the relation between the presence of anemia and the eating of cheese or yogurt with the meal among the pregnant women.

## METHODOLOGY

**Study type and design:** descriptive- cross sectional study.

**Study Area :** Elobied city, at Obstetrics and Gynecology Hospital which includes the departments ofaccidents, intensive care, laboratory, pharmacy, and referring clinic.

**Study population :** All the pregnant women attending antenatal care clinic (ANC) at Obstetrics and Gynecology Hospital in Elobied city during the study period.

**Inclusion criteria :** Mothers who attended antenatal care clinic (ANC) during the period from 15<sup>th</sup> August to 15<sup>th</sup> September, 2019 and who met the choosing criteria (systemic random sample) had chosen.

**Sampling :**

a / **Sample size :** The sample size was determined according to Le (9) by the following formula:

$$n = \frac{z^2 pq}{d^2}$$

Where:

n is sample size.

Z is the value of the standard normal variable corresponding to 95% level of significance (z = 1.96).

p is the prevalence of VL (p = 0.5) and (q = 1 -p) since no prior information exist.

d is a marginal error (d =0.05)

Accordingly, a sample of 384 persons will be obtained.

**b / Sample Technique :** The systematic random sample was used.

**Data Collection Methods and tools :**

In this study a structured pre-coded and close-ended questionnaire was used to collect data . Some health workers was trained to assist in filling the questionnaire. Blood samples were collected in (2.5ml).

## DATA ANALYSIS

The blood samples were analyzed in the laboratory of the hospital by Mindray Haematology Analyser to measure the level of hemoglobin. The cut-off points for the diagnosis of anaemia was according to the hemoglobin level as mentioned by park (10), where A hemoglobin level of 10 to 11 g/dl has been defined as early anaemia; a level below 10 g/dl as marked anaemia.

The data of questionnaire were analyzed by statistical package for social sciences (SPSS) . The results were presented in figures and tables showing the percentages. The relations between some variables and the infection by anaemia were done according to Al Qassas (11) and Le (12) by McNemar,s test ( Chi- square (X<sup>2</sup>) test) for the correlative percentages in the table (2x2) by the formula:

$$X^2 = \frac{(B - C)^2}{B + C}$$

Where:

B and C are cells in the table 2x2 (without the cells of the total) as in the following shape:

A	B
C	D



The value of  $\chi^2$  obtained from this formula compared with the value of  $\chi^2$  obtained from the table of  $\chi^2$  (appendix B). The result have statistical significance when the calculated value is larger than the tabulated value under significance level (0.05). The null hypothesis is rejected at the 0.05 level when  $\chi^2 \geq 3.84$ .

**Ethical considerations :**

Permissions for the study was obtained prior to collect data, by contacting and receiving the approvals from the competent directors in the Obstetrics and Gynecology Hospital, also the participants women in the study had assured with that the data needed from them will be in complete

confidence, and used only for scientific research purposes .

**RESULTS**

As illustrated in table 1, anemia was found in 75% of pregnant women ( 23.4% of them have marked anemia and 51.6 % of them have early anemia). Table 2 explained that 61.5% of pregnant women were eating the cheese or yogurt in the nutritional meal. Table 4 showed that 45.1% of anemic pregnant women were eating the cheese or yogurt in the meal. Table 3 showed the foods that eaten every day during pregnancy period, where 13.5% of them were eating meat, 47.9% of them were eating dairy products.

**Table (1): Distribution of pregnant women attending ANC in Elobeid City according to hemoglobin Level -- September, 2019**

Hemoglobin Level (g/dl)	Frequency	Percentage	Diagnosis of anaemia
5-9.9 g/dl	90	23.4%	Marked anaemia
10- 11 g/dl	198	51.6%	Early anaemia
<11 g/dl	96	25%	Normal
Total	384	100%	-

**Table (2): Distribution of pregnant women according to eating the cheese or yogurt with the meal - September, 2019**

Eating the cheese or yogurt in the meal	Frequency	Percent
Yes	236	61.5%
No	148	38.5%
Total	384	100%

**Table (3): Distribution of pregnant women according to foods that eaten every day during the pregnancy period - September, 2019**

The foods that eaten every day	Frequency	Percent
Meats	52	13.5
Eggs	20	5.2
They are all true	40	10.4
<b>Dairy products</b>	184	<b>47.9</b>
Orange	76	19.8
Tomato	6	1.6
Vegetables	6	1.6
Total	384	100%

**Table (4) :The relation between the anemia and the eating of cheese or yogurt among the pregnant women in Elobied city - 2019**

The presence of anemia	Eating of cheese or yogurt		Total
	Yes	No	
Present	173(45.1%)	115 (29.9%)	288(75%)
Not present	63(16.4%)	33(8.6%)	96(25%)
<b>Total</b>	<b>236(61.5%)</b>	<b>148(38.5%)</b>	<b>384(100%)</b>

N = 384, McNemar's test (  $\chi^2$  ) : calculated = 3.93 and tabulated = 3.84 . Significant level = 0.05



## DISCUSSION

This study showed that anemia was found in 75% of pregnant women (23.4% of them have marked anemia and 51.6% of them have early anemia as in table 1. This evaluation was according to what mentioned by Park (14): "A hemoglobin level of 10 to 11 g/dl has been defined as early anaemia; a level below 10 g/dl as marked anaemia.

The factor that contributes to this presence of anaemia among the pregnant women, was the ingestion of yogurt or cheese with nutritional meal, where the yogurt or cheese in nutritional meal provides a large quantity of calcium in meal, because the calcium is found in milk and milk products as mentioned by WHO (8): "The milk and milk products like the yogurt and cheese are the richest sources of calcium". The presence of calcium in nutritional meal affects iron absorption that found in the nutritional meal, and causes iron deficiency, and thus the anemia is occurred in pregnant women. This opinion was according to what mentioned by WHO (8): "The presence of large quantities of calcium in nutritional meal is conflicted with the iron absorption". In addition to that as it observed in table 3, the high percentage for foods that eaten every day during the pregnancy period were dairy products (47.9%) which contain the calcium as mentioned by WHO (8): "The milk and milk products are the richest sources of calcium". And this Calcium inhibits the absorption of haem and non-haem iron that found in meat and other foods that mentioned in table 3. This corresponds with what mentioned by Tidehag (7) and Tekeste (12): "Calcium inhibits both haem and non-haem iron absorption". Therefore the dairy products contribute to the anemia among pregnant women.

Statistically, the results of table 4 showed that the high percentage (45.1%) of the presence of anemia belongs to eating the cheese or yogurt with the meal, and the minimum percentage (29.9%) of the presence of anaemia belongs to lack of eating the cheese or yogurt with the meal. Those results prove that the eating of cheese or yogurt with the meal increases the presence of anemia cases. This result was have statistical significance, because the calculated value of McNemar's test ( $X^2$ ) was larger than the tabulated value ( $4.92 > 3.84$ ) under the significance level 0.05.

## CONCLUSION

The study discovered that eating of cheese or yogurt with the meal contributed to the anemia with 45.1%. This study recommended the pregnant women to eat cheese or yogurt with separate time of nutritional meal (not with the meal) to enhance the absorption of iron from the nutritional meal.

**Acknowledgement:** First we grateful to the God who succeed us to do this work.

We grateful to everyone who helped us to do this study in any step.

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