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Prevalence and associated factors of anemia among pregnant women in Khartoum City - Sudan: A cross sectional study.

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Abstract:
Background: During pregnancy, women are exposed to many psychological and physical changes and health problems, and the most prominent thing they face is anemia or anemia caused by a lack of iron level in the body.
Research problem: Anemia is a condition in which there is a deficiency in the number of red blood cells, and anemia during pregnancy is determined by performing routine pregnancy tests.
Methods: A facility-based cross-sectional study was conducted at Khartoum Educational Hospital in Sudan between 2021 and 20122
Objectives: The current study aims to find out the prevalence of anemia and its accompanying factors among pregnant women. The study also aims to identify the extent of anemia among pregnant mothers in different periods of pregnancy, as well as to identify the extent to which pregnant mothers use and maintain iron vitamins.
Results: The study sample consisted of 50 pregnant women, and through Table 1, we find that the ages of the study sample members less than 20 years old are equal to 2 by 4%, as well as the study sample members whose ages range from 21 to 25 years equals 6 by 12%, while the study sample members are the most frequent They are pregnant mothers in the age group from 31 to 35 years, where their number is 24 and their percentage is 48%, which is the highest percentage in the study
Conclusions: Through the results and discussions of the study, we found this study revealed that the prevalence of anemia among pregnant women was relatively high compared to the findings of other reports in khartoum city. The age were statisticaly significant associated factors with anemia in this study

Keywords:
Anemia- Gravidity - Pregnancy – Iron

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Introduction

During pregnancy, women are exposed to many psychological and physical changes and health problems, and the most prominent thing they face is anemia or anemia caused by a lack of iron level in the body; Iron is the main component of hemoglobin that carries oxygen to the cells of the body and brain, and one of the main pillars that enable the body to carry out its vital processes and functions. Exposure to anemia, especially during pregnancy, poses a threat to the health of the pregnant woman and the fetus together. Where the body produces an additional amount of blood up to 4 liters; Therefore, it is necessary to immediately review and ask the doctor how to treat it; To avoid symptoms and complications; Where the risks of iron deficiency extend to the fetus (because it needs it in large quantities during the period of its formation, and then retain it until 6 months of its life after birth).

Cause of Anemia:

- Heavy bleeding during previous deliveries or as a result of accidents.
- Menstrual bleeding or internal bleeding.
- Donate large amounts of blood.
- Pregnancy
- Malnutrition.
- Genetic Disease

Factors that make pregnant women more susceptible to anemia:

- Having iron deficiency before pregnancy.
- Having a disease that causes anemia (eg: sickle cell).
- An imbalance in the digestive system impedes the absorption of iron and nutrients.
- Pregnancy with more than one fetus (twins and more), to increase their need for iron.
- Having anemia in a previous pregnancy.
- Sequential pregnancies (the two pregnancies are separated by one year).

Research Problem

Anemia is a condition in which there is a deficiency in the number of red blood cells, and anemia during pregnancy is determined by performing routine pregnancy tests.

Hemoglobin is one of the main proteins in red blood cells, which carries oxygen from the lungs to all parts of the body and helps remove carbon dioxide. Non-pregnant women develop anemia when the number of red blood cells is less than 12 milligrams per 100 cubic centimeters, while pregnant women develop anemia when the number of red blood cells is less than 10-11 milligrams per 100 cubic centimeters.

As the main research problem is to know the prevalence of anemia and the factors accompanying it among pregnant women. Brhane Berhe (2019) found Anemia remains a major public health problem in Ethiopia, which causes maternal and fetal severe consequences. In Tigrai, there are limited literatures on prevalence of anemia and associated factors among pregnant women. Thus, a hospital based cross- sectional study was conducted to determine the prevalence and associated factors of anemia in Adigrat General Hospital. Data was analyzed and computed using SPSS version 22. p value = 0.05 at 95% confidence interval was considered statistically significant.

Angesom Gebreweld(2019) In pregnancy, anemia is an important factor associated with an increased risk of maternal, fetal, and neonatal mortality, poor pregnancy outcomes, and impaired cognitive development, particularly in developing countries he found that The prevalence of anemia was found to be 11.6% (95 % CI; 7.8%-14.8%). Pregnant women in the second [AOR (95% CI), 6.72 (1.17-38.45), and P=0.03] and third trimester [AOR (95% CI), 8.31 (1.24-55.45), and P=0.029] were more likely to be anemic when compared to pregnant women in their first trimester. Pregnant women who did not receive iron/folic acid supplementation [AOR (95%CI), 4.03(1.49-10.92), and P=0.01] were more likely to be anemic when compared to pregnant women who did take supplementations.

Research Objectives

The current study aims to find out the prevalence of anemia and its accompanying factors among pregnant women. The study also aims to identify the extent of anemia among pregnant mothers in different periods of pregnancy, as well as to identify the extent to which pregnant mothers use and maintain iron vitamins.

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Research Questions
The study seeks to answer the following questions:

1. What are the factors for the prevalence of anemia among pregnant women?
2. At what age groups in pregnant women is anemia prevalent?
3. What are the factors that cause anemia in pregnant women?

Research Methodology Study Design
A facility-based cross-sectional study.

Period and Area
A cross sectional study was conducted at Khartoum educational hospital, sudan between 2021 and 20122.

Study Population
The study populations were pregnant women in all trimesters who visited at an um educational hospital, Sudan. Participants who were pregnant and fulfilled the inclusion criteria were included in the study. Each participant was enrolled only once on their first visit during the study period.

Sample Size
The actual sample size for the study was determined based on the prevalence rate of (50%) anemia in pregnant women um educational hospital, sudan from the previous study and also to get maximum sample size. The 95% confidence interval and 5% marginal error, sample size (n) the formula is shown below was used to determine the sample size. Simple random sampling technique was applied. Individual women who self-reported to the health center were included until 50 sample sizes were obtained [2]

N=Z2×P(1−P) D2N=Z2×P(1−P) D2

Where,

D = Marginal error, 5%, N = Sample size,
Z = Confident interval, 95%,
P = Based on 50% prevalence rate on the previous study Sample size was 50 pregnant women.
This sample calculated with sample size calculation software (sample Q)

Reliability
Cronbach reliability coefficient (Alpha):

This parameter is used to determine the stability parameter of the study tool with the questionnaire statements. The researcher has selected 20 sample units for a pilot study to find the reliability of the Cronbach reliability coefficient (Alpha) found equal to 0.82; this result means that the questionnaire is valid and having good reliability.

Result:
The study sample consisted of 50 pregnant women, and through Table 1, we find that the ages of the study sample members less than 20 years old are equal to 2 by 4%, as well as the study sample members whose ages range from 21 to 25 years equals 6 by 12%, while the study sample members are the most frequent They are pregnant mothers in the age group from 31 to 35 years, where their number is 24 and their percentage is 48%, which is the highest percentage in the study. It is shown in figure (1). As for the weights of pregnant mothers, we find that the weights range from 40 kg to 49 kg, the number of mothers in this category is equal to only 3 at a rate of 6%, and we also find that mothers in the category of weights range from 50-59 kg, their number is equal to 7 at a rate of 14%. From 60 kilograms to 69 kilograms, their number is equal to 11 by 22%, as well as mothers in the category from 70 kilograms to 79 kilograms, their number is equal to 9 at a rate equal to 18%.

As for mothers whose weight is more than 80 kilograms, their number is 20 by It is equivalent to 40%, which is the highest percentage of weights, as shown in Figure (2). As for mothers who have had a previous pregnancy, their number is equal to 12 mothers, a rate equivalent to 24%, while for mothers who have not had a previous pregnancy, their number is equal to 38, or 76%. As for Gravidity, we find the mothers who have Gravida Only one, their number is 11 in a ratio equal to 22. As for her mother who have Gravida. From 2-4, their number is equal to 30 pregnant mothers, while those who have Gravida more than 5, their number is 9, at a rate of 18%, as shown in Figure (3) The mothers who continue to take iron vitamins, their number is equal to 35, by 70%. As for mothers who do not use iron vitamins, their number is equal to 15, with a percentage equal to 30%, as shown in Figure (4)

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Table 1. Sociodemographic, obstetric, and other characteristics of pregnant women (N=50).

Variables	Frequency	Percentage (%)
Age group (years)		
≤20	2	4
21-25	6	12
26-30	11	22
31-35	24	48
≥36	7	14
weight group (kg)		
40-49	3	6
50-59	7	14
60-69	11	22
70-79	9	18
≥80	20	40
Previous Pregnancy		
No	38	76
Yes	12	24
Gravidity		
1	11	22
2-4	30	60
≥5	9	18
Iron		
No	15	30
Yes	35	70

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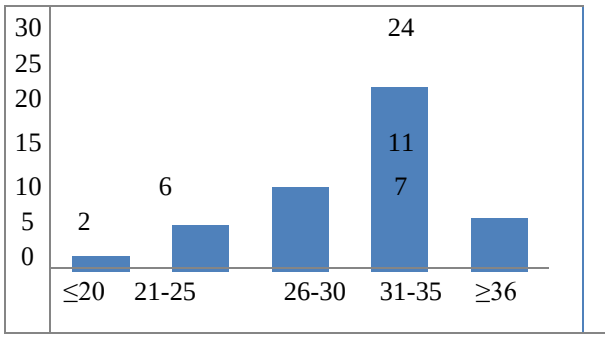

Fig1. Age group (years) of pregnant women (N=50)

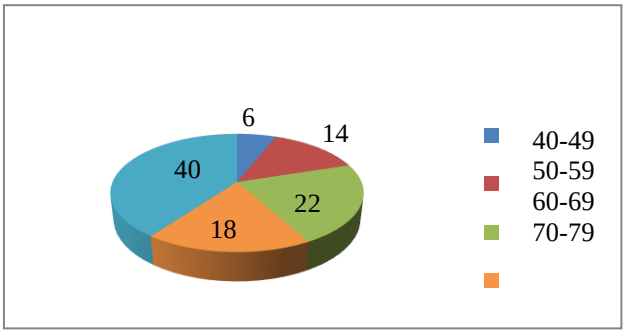

Fig 2. weight group (kg) of pregnant women (N=50)

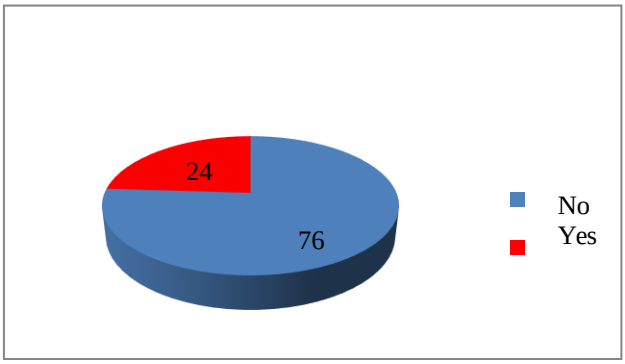

Fig 3. Previous Pregnancy of pregnant women (N=50)

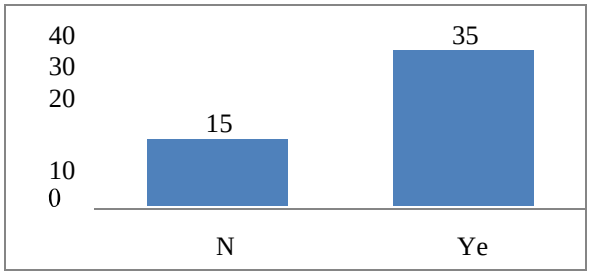

Fig4. Gravidity Pregnancy of pregnant women (N=50)

Table (2) shows the Prevalence of anemia among pregnant women by sociodemographic, obstetric, and other characteristics of pregnant women (N=50), where we find that the risks of anemia for the age groups of mothers are concentrated around the age groups from 21 to 25 years, where we find that the value of odd Ratio (OR) equals 2.58 and the P value equals 0.01 which is less than the significance level of 0.05, which means that there are statistically significant differences between age groups and anemia status. Therefore, the age groups of pregnant mothers are the most at risk of developing anemia, and we also find that age groups over 36 years It is also more likely to be affected by anemia, as we find that the odd ratio (OR) equals 2.53 and the P value equals 0.04, which is less than the level of significance 0.05, which means that there are statistically significant differences between the age groups and the anemia status. Therefore, the age groups of pregnant mothers are the most at risk of developing anemia. As for the rest of the age groups, it is not a symptom of anemia during pregnancy. The weight categories most susceptible to anemia are the lowest weight categories, as we find that pregnant mothers in the weight category from 40 to 49 kg are all suffering from anemia, as well as we find that the weight categories from 50 to 59 kg are all affected by anemia. In contrast, we find that all weight categories are in Others have a low incidence of anemia. As for Previous Pregnancy, we find that pregnant mothers who have never been pregnant are more likely to develop anemia, as they have no prior knowledge of vitamin iron or they do not regularly take it. Pregnant women who are pregnant for the first time On the other hand, we also find that mothers who have never been pregnant also suffer from anemia.

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Table 2. Prevalence of anemia among pregnant women by sociodemographic, obstetric, and other characteristics of pregnant women (N=50).

Variables	Anemia status		OR	P value
	Non-Anemic (%)	Anemic (%)		
Age group				
≤20	0 (0%)	2 (100%)	1	
21-25	1 (16.7%)	5 (83.3%)	2.58	0.01
26-30	1 (90.1%)	10 (90.9%)	1.49	0.19
31-35	8 (33.3%)	16 (66.7%)	1.55	0.18
≥36	0 (0%)	7 (100%)	2.53	0.04
weight group				
40-49	0 (100%)	3 (100%)	1	0.00
50-59	0 (100%)	7 (10%)	1	0.00
60-69	3 (72.7%)	8 (727%)	2.14	0.14
70-79	1 (11.1%)	8 (88.9%)	1.38	0.80
≥80	6 (300%)	14 (70.0%)	3.47	0.32
Previous Pregnancy				
No	8 (21.1%)	30 (78.9%)	2.24	0.02
Yes	2(16.7%)	10(83.3%)	1.55	0.54
Iron/folic acid Supplementation				
No	9 (25.7%)	26(74.%)	3.86	0.01
Yes	1 (6.7%)	14 (93.3%)	0.80	0.44

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Discussion

In this section of the research, the results that were reached through the results of the statistical analysis that were conducted in the previous part of the research were discussed. This study was carried out to assess the prevalence and factors associated of anemia among pregnant women receiving Khartoum medical hospital,sudan. he overall prevalence of anemia among pregnant women in this study was consisted of 50 pregnant women, and through Table 1, we find that the ages of the study sample members less than 20 years old are equal to 2 by 4%, as well as the study sample members whose ages range from 21 to 25 years equals 6 by 12%, while the study sample members are the most frequent They are pregnant mothers in the age group from 31 to 35 years, where their number is 24 and their percentage is 48%, which is the highest percentage in the study.This result consist of . Brhane Berhe(2019)found Anemia remains a major public health problem in Ethiopia, which causes maternal and fetal severe consequences. In Tigrai, there are limited literatures on prevalence of anemia and associated factors among pregnant women. Thus, a hospital based cross-sectional study was conducted to determine the prevalence and associated factors of anemia in Adigrat General Hospital.

As for mothers who have had a previous pregnancy, their number is equal to 12 mothers, a rate equivalent to 24%, while for mothers who have not had a previous pregnancy, their number is equal to 38, or 76%. As for Gravidity, we find the mothers who have Gravida

This result agreed with suzan ahmed (2019) she found that More than half of the pregnant women 221 (57.6%) were third trimester (gestational age more than 28 weeks), while 127 (33.1%) were second trimester (gestational age between 13 to 28 weeks) and 36 (9.4%) were first trimester (gestational age less than 13 weeks). Among all pregnant women 221 (54.9%) were multi-gravida, more than half of the pregnant women were without child 222 (57.8%) and women with one child 139 (36.2%). More than half of the pregnant women 221 (57.6%) were attending antenatal more than three times. (3)

The Prevalence of anemia among pregnant women by sociodemographic, obstetric, and other characteristics of pregnant women (N=50), where we find that the risks of anemia for the age groups of mothers are concentrated around the age groups from 21 to 25 years, where we find that the value of odd Ratio (OR) equals 2.58 and the P value equals 0.01 which is less than the significance level of 0.05, which means that there are statistically significant differences between age groups and anemia status. Therefore, the age groups of pregnant mothers are the most at risk of developing anemia, and we also find that age groups over 36 years It is also more likely to be affected by anemia, as we find that the odd ratio (OR) equals 2.53 and the P value equals 0.04, which is less than the level of significance 0.05, which means that there are statistically significant differences between the age groups and the anemia status.Also this result agreed with suzan ahmed.

Conclusion

Through the results and discussion of the study revealed that the prevalence of anemia among pregnant women was relatively high compared to the findings of other reports in Khartoum city. The Age were statistically significant associated factors with anemia in this study. Therefore, further large-scale longitudinal studies should be done in respect to the importance of regular visits to maternal care centers and health education promotion programs regarding the cause and prevention of anemia among pregnant women by assessing micronutrients and other causal related factors for anemia. One of the most important findings is that pregnant women in younger age groups are more likely to have anemia, as well as women who conceive for the first time. Also, weights that are less than normal are more prone to anemia. Therefore, expectant mothers must adhere to taking iron vitamins in the first months of pregnancy on a regular basis. Failure to adhere to it leads to serious consequences for the mother and fetus after birth and may lead to congenital malformations.

REFERENCES

Aschale, Y., Minwuyelet, A., Akalu, T. Y., & Talie, A. (2022). Prevalence of intestinal parasite infections and associated factors among pregnant women in Northwest Ethiopia. Journal of Parasitology Research, 2022.

Berhe, B., Mardu, F., Legese, H., Gebrewahd, A., Gebremariam, G., Tesfay, K., Adhanom, G. (2019). Prevalence of anemia and associated factors among

pregnant women in Adigrat General Hospital, Tigrai, northern Ethiopia, 2018. BMC research notes, 12(1), 1-6..

Gebreweld, A., & Tsegaye, A. (2018). Prevalence and factors associated with anemia among pregnant women attending antenatal clinic at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia. Advances in hematology, 2018.

Ahmed, S., Al Mamun, M. A., Mahmud, N., Farzana, N., Sathi, M. S. A., Biswas, B. K., ... & Ahmad, T. (2019). Prevalence and associated factors of Anemia among pregnant women receiving antenatal care (ANC) at Fatima Hospital in Jashore,

Bangladesh: a cross-sectional study. Food and Nutrition Sciences, 10(9), 1056-1071.

Bansal, R., Bedi, M., Kaur, J., Kaur, K., Shergill, H. K., Khaira, H. K., & Suri, V. (2020). Prevalence and factors associated with anemia among pregnant women attending antenatal clinic. Adesh University Journal of Medical Sciences & Research, 2(1), 42-48.

James, A. H. (2021). Iron Deficiency Anemia in Pregnancy. Obstetrics & Gynecology, 10-1097. Wesström, J. (2020). Safety of intravenous iron isomaltoside for iron deficiency and iron deficiency anemia in pregnancy. Archives of gynecology and obstetrics, 301(5), 1127-1131.

Lewkowitz, A. K., Gupta, A., Simon, L., Sabol, B. A., Stoll, C., Cooke, E., ... & Tuuli, M. G. (2019). Intravenous compared with oral iron for the treatment of iron-deficiency anemia in pregnancy: a systematic review and meta-analysis. Journal of Perinatology, 39(4), 519-532.

Tandon, R., Jain, A., & Malhotra, P. (2018). Management of iron deficiency anemia in pregnancy in India. Indian Journal of Hematology and Blood Transfusion, 34(2), 204-215