

Risk Factors for Anaemia in Pregnant Women: A Case Study of KIUTH Ishaka-Bushenyi, Uganda.

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ABSTRACT

Anaemia is a global public health issue affecting over 1.62 billion people, particularly pregnant women and children. The study aimed to identify risk factors associated with anemia among expectant women at KIU-TH. A total of 234 expectant women were studied, with a response rate of 97%. The study found that the overall prevalence of anemia among expectant women was 19.8%, significantly associated with factors such as age, gravidity, gestational age, history of malaria, history of geophagia, and ANC attendance. Primi gravidity, first trimester, malaria history, geophagia history, and one ANC visit were significant predictors of anemia prevalence. Pregnancy was observed to be anemic during the first trimester, with mothers overly exposed to mosquitoes contributing to malaria-induced anemia. Diet irregularities, such as reduced iron intake, were also observed, along with irregular ANC attendance. These factors contribute to the high prevalence of anemia among expectant women at KIU-TH.

Keywords: risk factors, anaemia, expectant women

INTRODUCTION

Anaemia is a global public health problem affecting over 1.62 billion people. It affects all age groups of people but pregnant women and children are more vulnerable [1-3]. It is a condition characterized by a low level of hemoglobin in blood, which decreases oxygen carrying capacity of red blood cells to tissues [4-6]. World health organization defines anemia in pregnancy as hemoglobin level less than 11g/dl [7]. The hemoglobin level for each class of anemia in pregnancy could be categorized as mild [10.0-10.9g/dl], moderate [7- 9.9g/dl], severe [less than 7g/dl] [8]. Examination of a stained blood smear using a microscope for morphology of red blood cells is helpful. Packed cell volume of less than 33.0% is regarded anemic by world health organization [8]. Measuring hemoglobin concentration is used as an alternative sign of iron deficiency [9-10].

Anemia is associated with potential adverse effects such as reduced power of labor and reproductive disorders [11-12]. In this disorder, the volume of red blood cells and the serum levels of iron decrease and in case of failure to compensate this loss, the hemoglobin levels also decrease and anemia occurs. Iron deficiency is the main cause of anemia during pregnancy. Increased risk of anemia during pregnancy is caused by the mother's increased need for iron, fetal and placental iron demands for growth, increased red blood cell mass and the mother's increased blood volume in the third trimester. This disorder during pregnancy is a recognized risk factor for the mother and the fetus [13-16]. The most important fetal complications include growth retardation, stillbirth, preterm birth, intrauterine death, low birth weight,

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increased perinatal and neonatal mortality, inadequate iron stores for the newborn, congenital malformations and the main maternal outcomes include loss of immune function, post-partum hemorrhage, cardiac failure, pre-eclampsia, increased risk of maternal morbidity and mortality, puerperal sepsis and lowered physical activity [17-19]. The main causes of anemia in developing countries include: inadequate intake and poor absorption of iron, folate, vitamin B12, vitamin A, malaria, hookworm infestation, diarrhea, HIV/AIDS, genetic disorders like sickle cell and thalassemia, blood loss during labor and delivery, heavy menstrual blood flow and closely spaced pregnancies. Severe anemia is associated with fatigue, weakness, breathlessness, dizziness, drowsiness, paleness of the skin. Worldwide anemia is a health problem contributing to 51% in pregnant women. Africa being most affected with prevalence of 17.2 million corresponding to 30% of total global cases [20-21]. Sub-Saharan Africa is the most affected region, with anemia prevalence estimated to be 17.2 million pregnant women, which corresponds to approximately 30% of total global cases [8].

METHODOLOGY

Study Area

The area of study was KIU-TH.

Study Population

The study population consisted of all pregnant women aged 20 to 45 years attending KIU-TH and consent to participate in this study.

Study Design

The study design was a descriptive Cross sectional and experimental

Sampling Technique

Simple random sampling through administering a questionnaire and blood collection

Sample Size Determination

The sample size was determined according to the formula of Swinscow (1997)

$$N = z^2(1 - p) / d^2$$

Where N=sample size required

Z_x = level of significance (1.96) for confidence interval 95%

p = prevalence of anemia 18.8% (Obai *et al.*, 2016) d = standard error deviation 0.05

$$N = 1.96^2 \times 0.188(1 - 0.188) / 0.05^2 N = 234$$

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Data Collection

Data was collected using questionnaires from participants who will have done a CBC with an Hb < 11.1 g/dl

Data Processing and Analysis

Data was analyzed using Microsoft Excel, calculator and presented in form of pie charts, tables, percentages, and bar graphs.

Inclusion Criteria

All pregnant women aged 20 to 45 years with Hb < 11.1 g/dl (who had done CBC) at KIU-TH and consented was allowed to take part in this study.

Exclusion Criteria

All pregnant mothers below 20 years and above 45 years, those without CBC results, those not attending KIU-TH and those not consented will not take part in this study.

Ethical Considerations

Informed consent and respect for participants

Voluntary recruitment was done and an informed consent was signed. Informed consent from participants was obtained after fully explaining the details of the study to them. Participants will not be forced to enroll themselves against their will. Participants were free to withdraw from the study at any time they wish without coercion or compromise of care they are entitled to.

Privacy and Confidentiality

Identification of participants was done by means of numerical codes. Details of respondents were kept under lock and key for privacy and confidentiality purposes throughout the course of research. Respect of the respondents' rights and fair treatment was strictly adhered to thus minimizing harm and discomfort to them.

Sampling technique

The study was descriptive Cross sectional. Purposive sampling was used to select pregnant mothers with anemic symptoms and then simple random sampling was used to choose pregnant mothers to include in the study with strict application of the inclusion criteria. Eligible participants were approached and requested to give a voluntary consent to participate in the study. Inclusion into the study was done sequentially until the required sample size is achieved.

Approval Procedure

Approval to carry out the study was obtained from the faculty of clinical medicine and dentistry and finally from the Kampala International University Research Ethics Committee (KIU-REC).

RESULTS

A total of 234 expectant women were studied with the response rate of 97%. Table 1 below shows the distribution of the study population by demographic characteristics. The results based on the 227 respondents showed that about 202 (89.0%) of the expectant women studied were married and 25 (11.0%) were single of which 17 (7.5%) were aged 15-20 years, 112 (49.3%) were aged 20-30 years and 98 (43.2%) were above 30 years. The mean age of study population was 25 years (with a standard deviation of 7.65 years).

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Table 1: Distribution of the Study Population by Demographic Characteristics

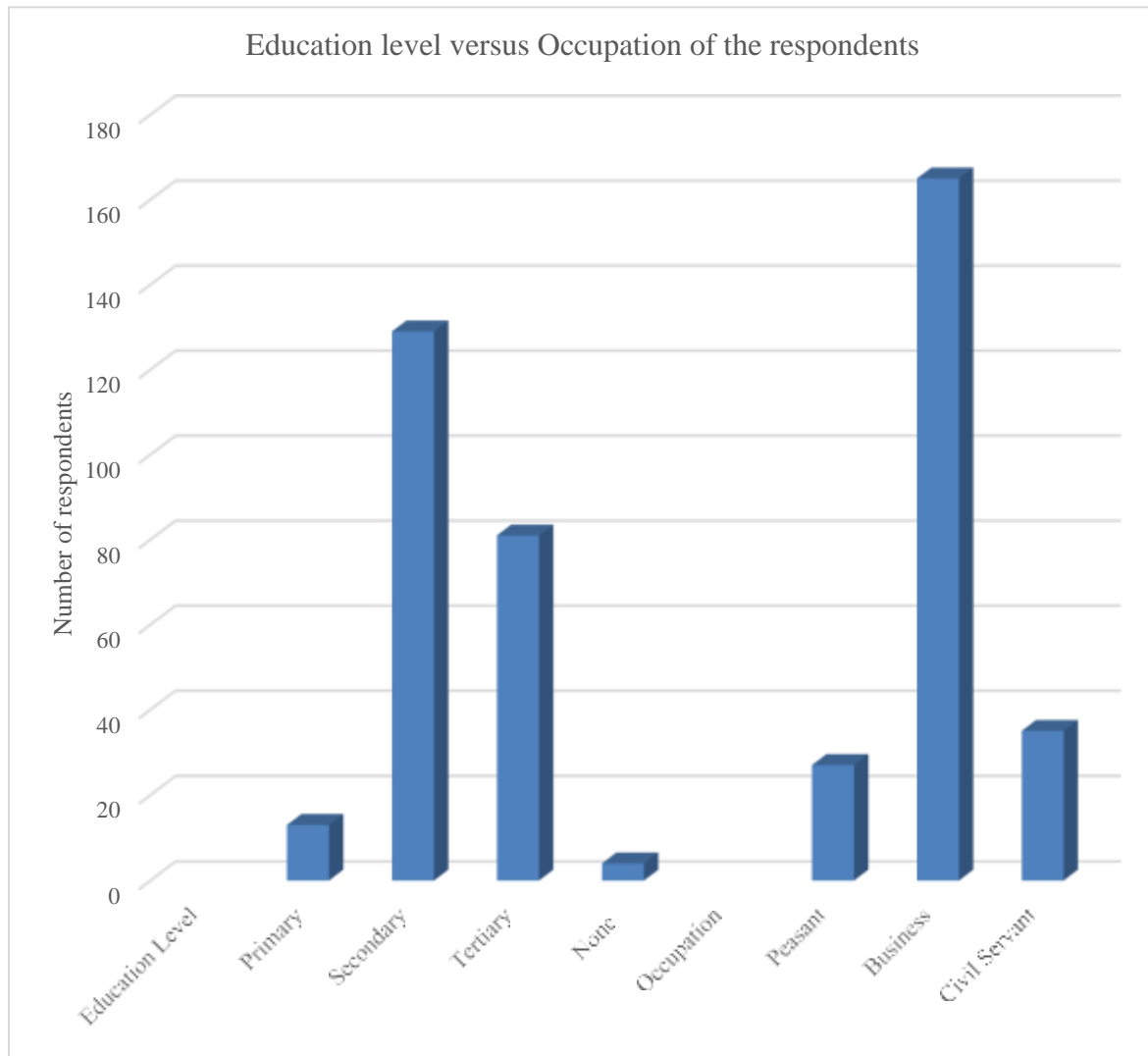
	N	Percent (%)	Confidence Interval	
			Lower	Upper
Age				
15-20	17	7.5	2.0	13.0
20-30	112	49.3	43.8	54.8
>30	98	43.2	37.7	48.7
Marital Status				
Single	25	11.0	5.5	16.5
Married	202	89.0	83.5	94.5
Education Level				
Primary	13	5.7	0.2	11.2
Secondary	129	56.8	51.3	62.3
Tertiary	81	35.7	30.2	41.2
None	4	1.8	-3.7	7.3

Figure 1 shows the comparative depiction between education level and occupation of the respondents in which we see that 13(5.7%) attained primary level, 129(56.8%) secondary, 81(35.7%) tertiary and 4(1.8%) had never attained any level of education. In comparison with occupation 27(11.9%) were peasants, 165(72.7%) were operating businesses whereas 35(15.4%) were civil servants.

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Figure 1: Graphical Depiction of Education level versus Occupation of the respondents



The gravidity and gestational age of the of the respondents is represented below in **Table 1** respectively showing that 86(38.0%), were carrying their first pregnancy, 39(17.0%) were carrying their second pregnancy, 27(12.0%) were at their third pregnancy, 25(11.0%) were carrying their fourth whereas 23(10.0%) and 27(12.0%) were carrying the fifth and above pregnancy respectively; with 141(62.0%) in the first trimester, 48(21.0%) in the second and 39(17.0%) in the third trimester.

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Table 2: Gravidity and Gestational Age of the respondents

	N	Percent (%)	Confidence Interval	
			Lower	Upper
Age				
Gravidity				
G1	86	38.0	32.5	43.5
G2	39	17.0	11.5	22.5
G3	27	12.0	6.5	17.5
G4	25	11.0	5.5	16.5
G5	23	10.0	4.5	15.5
>G5	27	12.0	6.5	17.5
Trimester of Current Pregnancy				
1	141	62.0	56.5	67.5
2	48	21.0	15.5	26.5
3	39	17.0	11.5	22.5

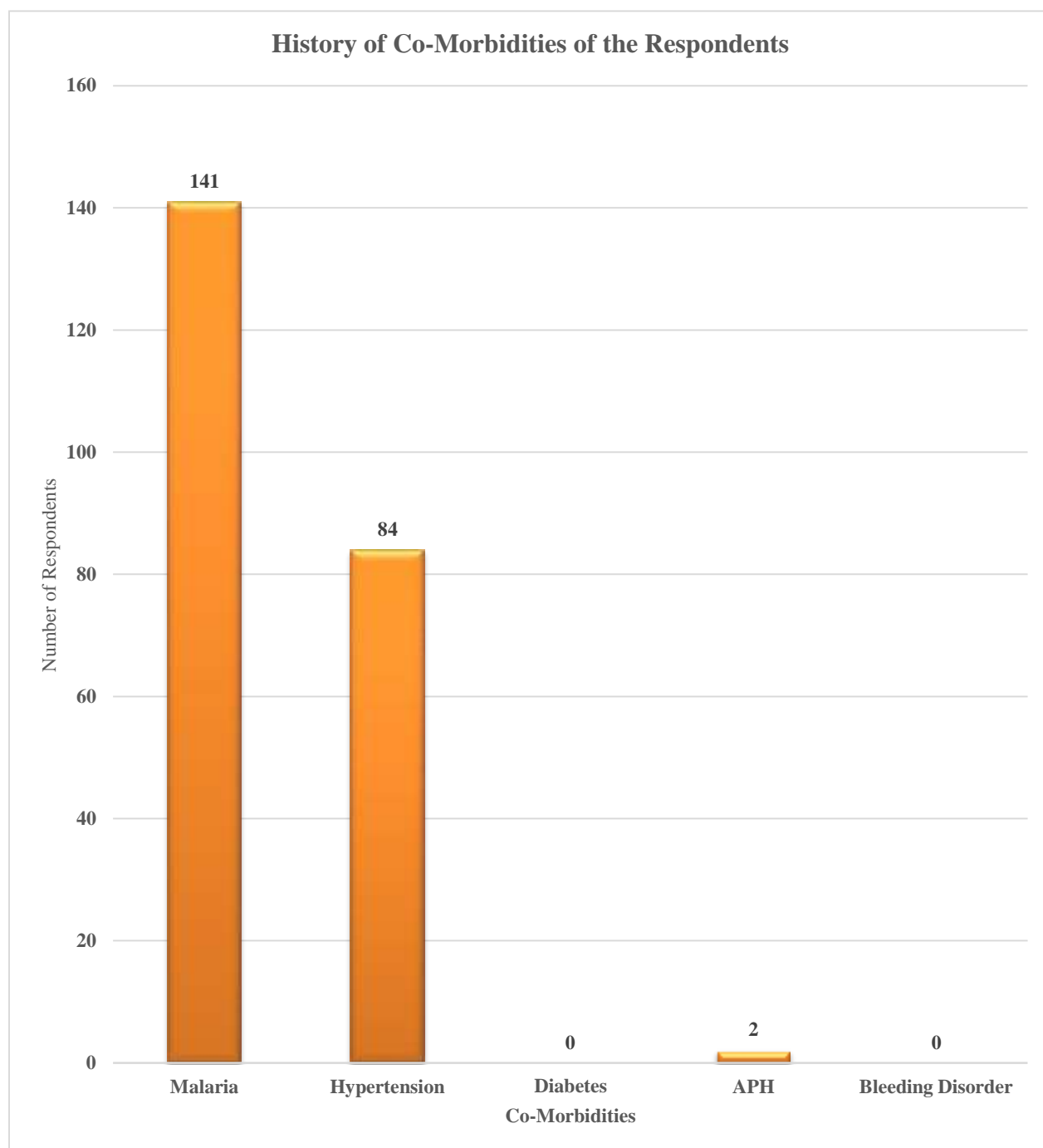
History of Co-Morbidities

It is depicted that 141(62.1%) of the respondents had malaria, 84(37.0%) were hypertensive, 2(0.9%) had history of antepartum hemorrhage whereas no respondent was either diabetic or had a hemorrhagic disorder. Further representation shown in Figure 2 below.

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Figure 2: Graphical Depiction of Co-Morbidities



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Table 3 shows the overall health service seeking behavior of the respondents in terms of ANC attendance. It is clearly shown that 107(47.1%) had attended their first ANC visit, 61(26.9%) were on their second visit, 34(15.0%) were on the third ANC visit whereas 25(11.0%) were on their fourth ANC visit.

Table 3: ANC Attendance of the Respondents and Hemoglobin Level

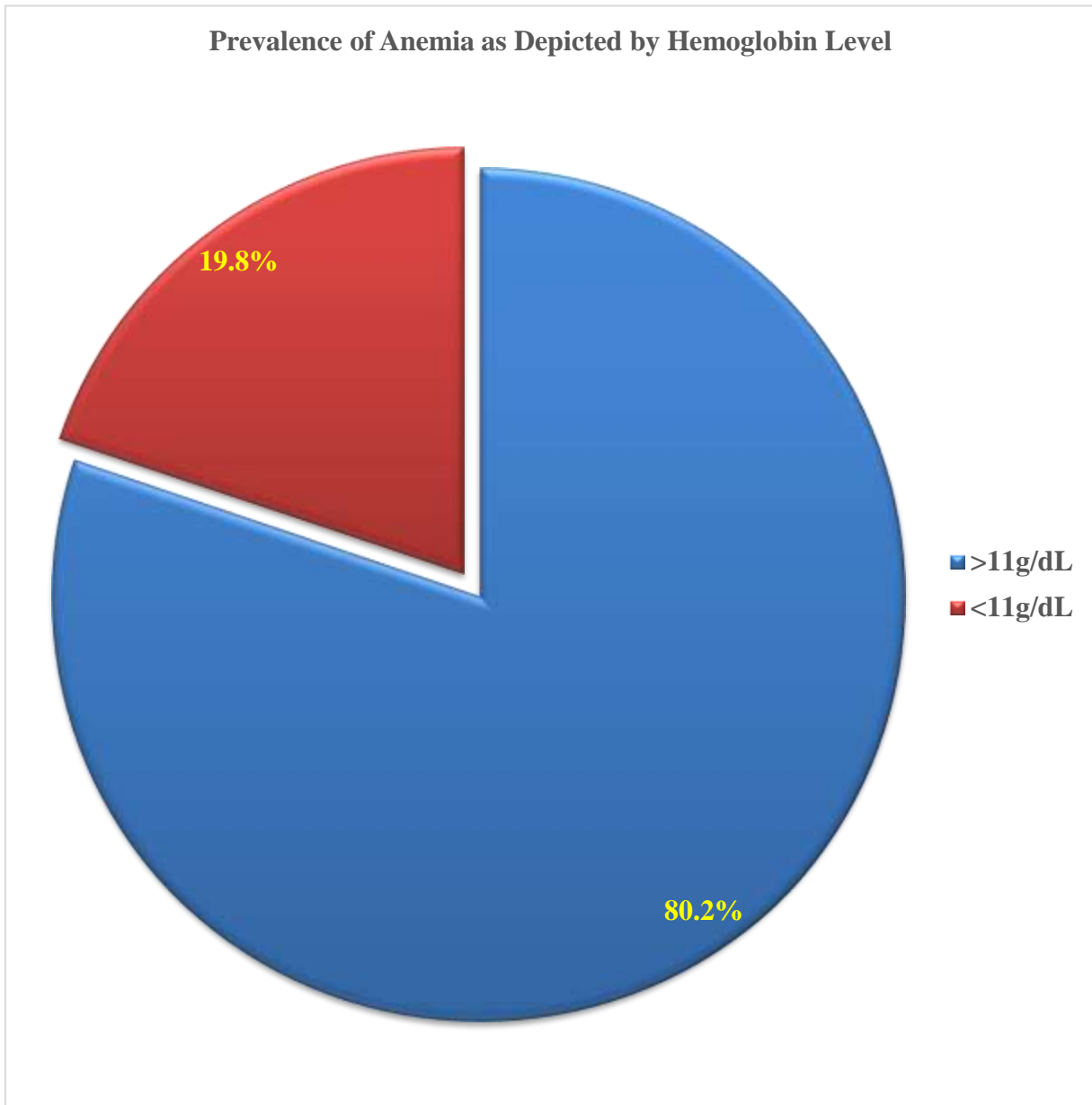
	N	Percent (%)	Confidence Interval	
			Lower	Upper
ANC Attendance				
Once	107	47.1	41.6	52.6
Twice	61	26.9	21.4	32.4
Thrice	34	15.0	9.5	20.5
Four Times	25	11.0	5.5	16.5

Figure 3 depicts the prevalence of anemia among the respondents based on the recorded hemoglobin level; 45(19.8%) of the respondents had a hemoglobin level less than 11g/dL whereas 182(80.2%) had a hemoglobin level above 11g/dL depicting that the prevalence of anemia among the respondents was 19.8%.

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Figure 3: Graphical Presentation of Prevalence of Anemia among Respondents.



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Table 4: Multivariate Analysis

Characteristic	N	Percent (%)	Confidence Interval		OR	P-Value
			Lower	Upper		
Age						
15-20	17	7.5	2.0	13.0	0.1518	0.033*
20-30	112	49.3	43.8	54.8	1.1429	0.004
>30	98	43.2	37.7	48.7		
Gravidity						
G1	86	38.0	32.5	43.5	2.2353	0.002*
G2	39	17.0	11.5	22.5	1.4167	0.004
G3	27	12.0	6.5	17.5	1.0909	0.005
G4	25	11.0	5.5	16.5	1.1000	0.005
G5	23	10.0	4.5	15.5	0.8333	0.006
>G5	27	12.0	6.5	17.5		
Trimester of Current Pregnancy						
1	141	62.0	56.5	67.5	2.9524	0.002*
2	48	21.0	15.5	26.5	1.2353	0.004
3	39	17.0	11.5	22.5		
History of Comorbidities						
Malaria	141	62.1	56.6	67.6	1.6786	0.003**
Hypertension	84	37.0	31.5	42.5		
Diabetes	0	0.0	-5.5	5.5		
APH	2	0.9	-4.6	6.4		
Bleeding Disorder	0	0.0	-5.5	5.5		
What kind of food do you eat always?						
Carbohydrates	116	51.1	45.6	56.6	2.8293	0.002

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History of Geophagia						
Yes	195	85.9	80.4	91.4	6.0938	0.001**
No	32	14.1	8.6	19.6		
ANC Attendance						
Once	107	47.1	41.6	52.6	1.7541	0.003*
Twice	61	26.9	21.4	32.4	1.7941	0.003
Thrice	34	15.0	9.5	20.5	1.3600	0.004
Four Times	25	11.0	5.5	16.5		
HB Level						
>11g/dL	182	80.2	74.7	85.7	4.0444	0.001
<11g/dL	45	19.8	14.3	25.3		
Proteins	41	18.1	12.6	23.6	1.7826	0.003
Vegetables	23	10.1	4.6	15.6	0.4423	0.011
Balanced Diet	52	22.9	17.4	28.4		

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DISCUSSION

This study was a cross sectional descriptive and exploratory study which focused on the determination of the prevalence of anemia among pregnant mothers at KIU Teaching Hospital in Ishaka, Bushenyi District-Western Uganda. The study showed that the overall prevalence of anemia among expectant women was 19.8% at the instant of data collection majorly based on data retrieved from the ANC books presented by the respondents and responses given by the participants. This prevalence was shown to be significantly associated with a number of factors including age, gravidity, gestational age, and history of malaria, history of geophagia and ANC attendance. Primi gravidity, first trimester, malaria history, geophagia history, and one ANC visit showed the highest odds of causing anemia in expectant women at KIU-TH. The significance of these variables was computed using Pearson's correlation of which Primi gravidity was significant with a value of 0.159 ($P=0.002^*$), first trimester with a value of 0.286 ($P=0.002^*$), malaria history with a value of 0.131 ($P=0.003^{**}$), geophagia history with a value of 0.298 ($P=0.001^{**}$), and one ANC visit with a value of 0.256 ($P=0.003^*$) with a 2 tailed test at 95% confidence level, $P<0.05$.

Anemia affects 24.8% of the world's population [8]. Globally, the prevalence of anemia among pregnant women has been estimated to be 41.8%, corresponding to 56.4 million [21]. Anemia is a public health problem throughout the world, particularly in developing countries which can affect human health, social and economic development. Anemia consequences on maternal health include less exercise tolerability, puerperal infection, thromboembolic problems, postpartum hemorrhage, pregnancy-induced hypertension, placenta previa and cardiac failure [6-8]. Anemia can contribute up to 40% of maternal mortality in which the majority of this happens in underdeveloped countries.

CONCLUSION

Anemia among expectant women at KIU-TH is high (19.8%), influenced by factors like age, gestational age, malaria history, geophagia, and ANC attendance. Anemia is more prevalent during the first trimester, with overexposure to mosquitoes and reduced iron intake.

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CITE AS: Yahaya Umar (2023). Risk Factors for Anaemia in Pregnant Women: A Case Study of KIUTH Ishaka-Bushenyi, Uganda. NEWPORT INTERNATIONAL JOURNAL OF PUBLIC HEALTH AND PHARMACY (NIJPP) 4(1):79-91