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## Prevalence and Demographic Characteristics of Pregnant Women with Anemia Attending Antenatal Care at Fort Portal Regional Referral Hospital

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### ABSTRACT

Pregnancy anemia is a global health issue that affects low-, middle-, and high-income nations and has a number of negative effects on health and socioeconomic development. Globally, an estimated 40.1% of expectant mothers experience anemia. One of the most difficult public health issues in underdeveloped nations is anemia during pregnancy. Severe anemia contributes to maternal morbidity and death on a very regular basis, even if a causal connection isn't always established. Therefore, this study aims to determine the prevalence and demographic characteristics of pregnant women with anemia attending antenatal care at Fort Portal Regional Referral Hospital (FPRRH). A hospital-based cross-sectional descriptive study was conducted in order to determine the prevalence of anemia and the demographic characteristics of pregnant women with anemia at FPRRH. Using a sample of 384 pregnant women attending antenatal care at FPRRH. The participants were selected consecutively until desired sample size was attained. The prevalence of anemia among pregnant women attending antenatal care at Fortportal Regional Referral Hospital was found to be 15% and those without anemia were 85%. The majority of pregnant mothers with anemia were under the age of 25, followed by those between the ages of 26 and 35, and a minority over 35. The majority of mothers with anemia had completed primary school, followed by tertiary and secondary. Also, most of the mothers with anemia earned UGX100,000-150,000, with a minority earning UGX260,000-300,000 or more. The majority of mothers with anemia were single, divorced, and married. The majority of anemic mothers were Anglican, followed by Catholics and Adventists. Age, education level, income level, and marital status, the religion of mothers attending antenatal care at FPRRH, were associated with the occurrence of anemia. The population needs to be educated about the effects of anemia in pregnancy such that pregnant mothers take caution against anemia. The government should improve antenatal care services.

**Keywords:** Pregnancy, anemia, antenatal care, hemoglobin, Maternal death.

### INTRODUCTION

Anemia is a condition where the number of red blood cells or the hemoglobin (Hb) concentration within them is lower than normal [1-3]. Specifically, anemia in pregnancy is defined as a hemoglobin concentration of less than 11.0 g/d in the first and third trimesters, and 10.5 g/dl in the second trimester in venous blood [4-6]. Worldwide, the prevalence of anemia during pregnancy has been estimated at 41.8%, corresponding to 56.4 million women [7]. 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 [8-10]. In Uganda, 49% of the women of reproductive age are anemic, and the prevalence is even higher (64.4%) among those who are pregnant [11-13]. Anemia in pregnancy remains one of the most intractable public health problems in developing countries [14-16].

Namyalo *et al*

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It is extremely common and although not always shown to have a causal link, severe anemia contributes to maternal morbidity and mortality [17-19]. Anemia, even when mild to moderate affects the sense of well-being resulting in fatigue, stress, and reduced work productivity [20-22]. During labor, women with severe anemia are less able to endure moderate blood loss and as a consequence are at a higher risk of requiring a blood transfusion during delivery, thus exposing patients unnecessarily to the risk of infection with human immunodeficiency virus (HIV) and other bloodborne pathogens [23, 24]. It is estimated that anemia may be responsible for as much as 20% of all maternal deaths in sub-Saharan Africa through three main mechanisms. Firstly, anemia makes women more susceptible to death from hemorrhage by lowering their hematological reserves for blood loss, especially at birth. Severe anemia is associated with increased susceptibility to infection due to lowered resistance to disease, and Hb<4 g/dl is also associated with a high risk of cardiac failure, particularly during delivery or soon after, making the woman likely to die if unable to reach good health facilities immediately [19]. Studies have shown an association between anemia and maternal mortality from both hospital data and community-based studies [25]. The complication may not end up with maternal anemia but also causes a complication for the child including; low pregnancy weight gains and intrauterine growth retardation, followed by low birth weight and higher perinatal mortality rates [26]. In addition, severe maternal anemia may impair the oxygen delivery to the fetus thereby contributing to neonatal deaths [27]. Moreover, infants of anemic women are born with reduced iron stores and are at risk of anemia during infancy and increased risk of infant morbidity and mortality [16, 18]. Reduction of anemia during pregnancy is, therefore, a key component of safe motherhood [28]. Several studies have also determined the factors that might contribute to the causes of anemia among pregnant women. For instance, geo-helminth infections during pregnancy may be associated with maternal anemia. Hookworm is known to cause anemia among pregnant women and hookworm infection mainly aggravates anemia in pregnant women [13]. Infections by geo-helminths lead to malnutrition, iron deficiency anemia, and increased vulnerability to other infections in infected pregnant women [29, 30]. Malnutrition is also one of the major causes of anemia among pregnant women [31]. Working to improve the nutritional status of pregnant women through supplementation of vitamin A, iron, and iodine is important to minimize the risk of anemia [32]. Knowing the prevalence of anemia in pregnancy is a useful measure of the health and nutritional status of pregnant women [32]. At the health facility level, it is important for individual case management and planning of resources. There is also a need of having current information on burden and effects of anemia during pregnancy. Therefore, this study aims to determine prevalence and demographic characteristics of pregnant women with anemia attending antenatal care at FPRRH which this study aims to find. Evidenced based data gathered can be used to potentially optimize the antenatal care offered to pregnant women in the area. The information will also help policy makers, stakeholders, and researchers to collaborate and design interventions to improve maternal health outcomes across the country.

## METHODOLOGY

### Study design

This was a hospital- based cross-section descriptive study to determine the prevalence of anemia and describe the demographic characteristics of pregnant women with anemia at FPRRH.

### Area of Study

The study was conducted in the Fort Portal Regional Referral Hospital located in western Uganda, approximately 294.6km from Kampala the capital city of Uganda. The coordinates are (latitude 0.654959; longitude 30.2801436) The hospital has different departments and respective wards such obstetrics and gynecology, Pediatrics, Surgery, Internal medicine, Accident and Emergency as well as specialized clinics such as Ophthalmology and Psychiatry with bed capacity of 330. Under obstetrics and gynecology, services such as antenatal care, family planning and cervical cancer screening are offered. On average 60 pregnant mothers attend antenatal care at FPRRH.

### Study population

The study was conducted among pregnant women attending antenatal care at FPRRH.

### Inclusion criteria

It included all pregnant women attending Antenatal care at FPRRH, available at the time of collecting data and willing to participate in the study.

### Exclusion criteria

Pregnant women attending Antenatal care at FPRRH who refused to consent to the study.

### Sample size determination

#### Sample size determination and rationale

The sample size was determined using the Kish Leslie's formula (1965)

Namyalo *et al*

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Where 'n' is the desired minimum sample size, Z is value at  $\alpha = 0.05$  which is 1.96, e =margin of error which is proposed to be 0.05, p is the proportion of pregnant women attending antenatal care at FPRRH. Since there is no literature about the prevalence of anemia among pregnant mothers in FPRRH, we shall consider the median prevalence, 50%

$$n = \frac{(Z_{\alpha/2})^2 p(1-p)}{e^2}$$

$$n = \frac{(1.96 \times 1.96)(0.5 \times 0.5)}{(0.05 \times 0.05)}$$

$$n = 384.16$$

therefore, n, sample size is 384.

#### **Sampling procedure**

Participants in this research were selected consecutively until the desired sample size had been attained.

#### **Data Management**

##### **Quality control**

To ensure quality control the researcher conducted a pre-test using 10 questionnaires and data were collected before the actual study to help in reconstruction of the questionnaire where necessary.

##### **Data collection method and tool**

Data was collected by the principal investigator (PI) and trained research assistant using an interviewer-administered questionnaire. The researcher met with the targeted respondents that took part in the study, after obtaining permission for data collection from respondents. Each participant was required to give an informed consent before enrolling in the study. The researcher assisted the respondents in filling the questionnaires by explaining to the respondents for clarifications. The properly filled questionnaires were then collected and then data taken for analysis. The researcher used a structured questionnaire and participants were asked similar questions and from options, they picked the best alternative. A pen and paper were used to record the necessary information.

##### **Data entry and cleaning**

All data was entered and coded into the computer.

##### **Data analysis**

The data analysis was per objective. Descriptive statistics were used and results presented in form of tables and pie charts.

##### **Ethical considerations**

Ethical approval was sought from the Department of Obstetrics and Gynecology, Kampala International University (K.I.U) and the Research and Ethics Committee (REC) of KIU.

Permission from Hospital director was sought. Participants were given information regarding the research to seek consent. Each participant's choice to participate or not was respected and data collected from participants was kept confidential.

Namyalo *et al*

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**RESULTS**  
**Demographic characteristics of respondents**  
**Table 1: Demographic characteristics of respondents**

Demographic characteristics		Frequency	Percentage (%)
Age	≤25	110	29
	26-34	180	47
	≥35	94	24
	Total	384	100
Education level	Primary	190	50
	Secondary	104	26
	Tertiary	90	24
	Total	384	100
Income level	100,000 – 150,000	160	42
	160,000 – 200,000	70	18
	210,000 – 250,000	64	16
	260,000 – 300,000	50	13
	310,000 and above	40	11
	Total	384	100
Marital status	Single	100	26
	Married	200	53
	Divorced	84	21
	Total	384	100
Religion	Anglican	80	21
	Catholic	150	39
	Moslem	50	13
	Adventist	64	16
	Other specify	40	11
	Total	384	100

Source: Field data, August, 2022

Majority 180(47%) of mothers were in the age group 26-34 years followed by 110(29%) with ≤25 and the minority were 90(24%) who belonged to ≥35 years. Majority 190(50%) of the respondents had primary level of education, 100(26%) had attended secondary level and 90(24%) had tertiary level of education. Majority 160(42%) of the respondents belonged to 100,000 – 150,000 Uganda shillings while the least 40(11%) respondents belonged to 260,000 – 300,000 and 310,000 and above respectively. Majority 200(53%) of the respondents were married followed by 100(26%) who were single and the least 84(21%) were divorced mothers. Majority 150(39%) of the respondents were Catholics followed by 80(21%) who were Anglican while the least 40(11%) respondents were others.

**Prevalence of Anemia among Pregnant women attending antenatal care at Fort Portal Regional referral hospital**

The prevalence of Anemia among pregnant women attending Antenatal care at Fort Portal Regional Referral Hospital was found to be 15% and those without anemia were 85% of the study sample.

Namyalo *et al*

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Figure1: Pie-chart showing prevalence of anemia among pregnant women.

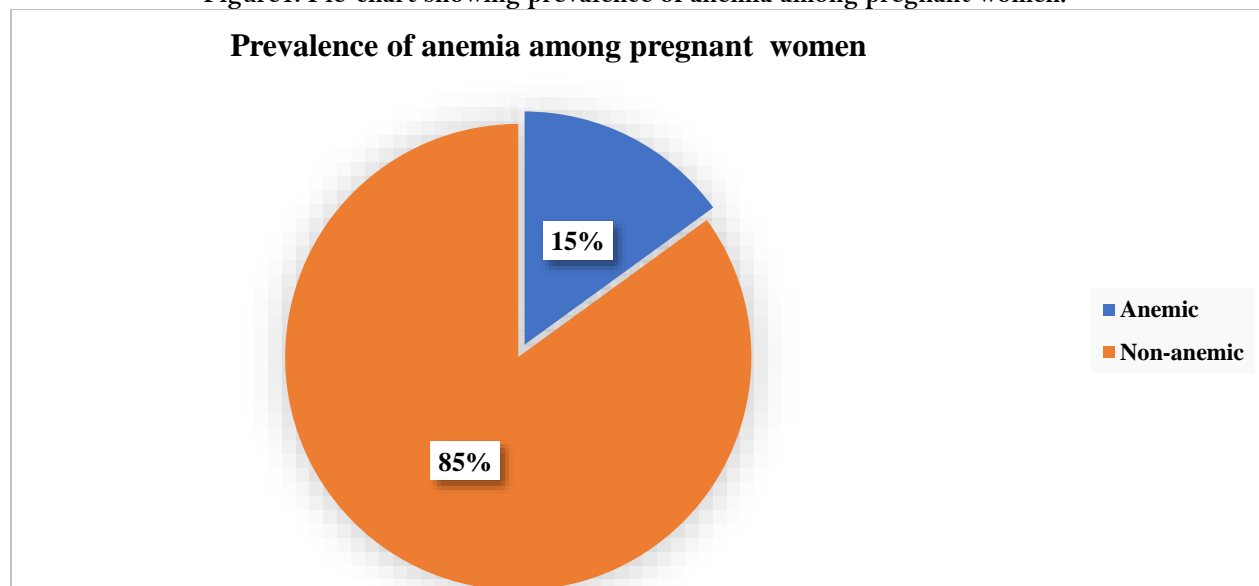


Table 2: Demographic characteristics of respondents with anemia

Demographic characteristics		Frequency of anemia	Percentage(%)
Age	≤25	7	12.1
	26-34	4	6.8
	≥35	3	5.1
Education level	Primary	8	13.7
	Secondary	4	6.8
	Tertiary	6	10.3
Income level	100,000 – 150,000	4	6.8
	160,000 – 200,000	2	3.4
	210,000 – 250,000	3	5.1
	260,000 – 300,000	1	1.7
	310,000 and above	1	1.7
Marital status	Single	4	6.8
	Married	1	1.7
	Divorced	3	5.1
	Religion	3	5.1
Religion	Anglican	3	5.1
	Catholic	2	3.4
	Moslem	1	1.7
	Adventist	2	3.4
	Other specify	0	0

Source: Field data, August, 2022

Majority 7 (1.8%) of pregnant mothers with anemia were in age group < 25 followed by 4 (1.0%) in age 26-35 and minority 3 (0.8%) > 35. Majority of mothers with anemia were from primary level of education 8 (2.1%) followed by those in tertiary 6 (1.5%) and minority from secondary 4 (1.0%). Majority of mothers with anemia were earning 100,000-150,000 4 (1.0%) and minority from 260,000-300,000 and above 1 (0.3%). Majority of mothers with anemia were single 4 (1.0%), followed by divorced 3 (0.8%) and minority from married 1 (0.3%). Majority of mothers with anemia were Anglican 3 (0.8%) followed by Catholics and Adventists 2 (0.5%) Muslims 1 (0.3%).

Namyalo *et al*

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## DISCUSSION

### Prevalence of anemia among respondents

According to the current study, the prevalence of anemia among pregnant women attending antenatal care at Fort Portal Regional Referral Hospital was found to be 15%. This prevalence is lower than the global prevalence of anemia in pregnancy, which has been estimated at 40.1% [33], as well as Uganda's national prevalence of 30.4% [34]. This depicts the spatial distribution of anemia from region to region, based on the research methods used. The prevalence was also lower when compared to other studies in Uganda, including one in southwestern Uganda with a prevalence of 62.8%, Hoima with a prevalence of 12.1%, and Gulu with a prevalence of 32.9% [35]. The prevalence of anemia in the current study is also lower than in previous studies conducted outside of Uganda, such as in Kisangani, DRC, where it was 76.2% [36] and southwest Ethiopia, where it was 23.5% [37]. This prevalence is however, slightly higher than that found in previous studies in Ethiopia (9.7%) [8]. The discrepancies in findings could be related to bigger sample sizes, hemoglobin estimating methodologies, and geographical regions in earlier studies compared to the current study.

### Demographic characteristics of respondents with anemia

Majority 7(1.8%) of mothers were in the age group, <25 years followed by 4(1.0%) with 26-34 and the minority were 3(0.8%) who belonged to ≥35 years. Young mothers find it important to care much about their lives compared to their older counterparts. These findings therefore mean that young mothers find it important to care much about their lives compared to their older counterparts. This was in line with findings of Nepal by Gautam *et al.* [38] who found out that young women of reproductive age were more likely to seek antenatal health care services than older mothers. The majority 15(50.0%) of the respondents had a tertiary level of education, 10(33.3%) had attended secondary level and 5(16.7%) had a primary level of education. Mothers who had attained some level of education were more responsible about their health compared to their counterparts who had no or little education. This may be mainly due to variations in their level of understanding. This finding did not differ from that of the study done in Tanzania by Stephen *et al.* [34] on prevalence, risk factors, and adverse perinatal outcomes which revealed that women with better education had twice the odds of attending ANC compared to women with lower education level. Majority 4(1.0%) of the respondents said their income levels belonged to 100,000 – 150,000 Uganda shillings while the least 1(0.3%) respondents belonged to 260,000 – 300,000 and 310,000 and above respectively. Since ANC services involve costs like transport, mothers from families with stable income stand better chances of attending to ANC services compared to mothers who have no reliable source of income. Therefore, this means that most mothers belonged to low incomes levels which gave them hard time in attendance of ANC and treatment of anemia. These findings differ with the findings of Derso *et al.* [39] in Ethiopia on magnitude and associated factors of anemia among pregnant women which showed that, the likelihoods of ANC attendance were high among the higher income earners. Majority 4(1.0%) of the respondents were single followed by 3(0.8%) who were divorced and the least 1(0.3%) were married mothers. In situations where a mother gets help from a husband, seeking medical health services can be more easily compared to other mothers who needed to first seek for help from family members especially the single ones. This finding is similar with the findings by Gudeta *et al.* [40] on factors associated with magnitude of anemia found out that marital status is significantly associated with the magnitude of anemia and found that married women were more likely to attend ANC as compared to other women. The majority 3(0.8%) of the respondents were Anglicans followed by 2(0.5%) who were Catholics and Advents while the least 1(0.3%) respondents were Muslims. This study mostly involved Catholics because the population of Catholics is higher as compared with other religions. The above results agree with the findings of the study conducted from Nigeria by Ndukwu and Dienye [41] to compile and analyze the existing evidence which was mostly involved by Christians and showed that religious influence over immunization up take among Christians was 66% and only 32% among Muslims. This equally led to the occurrence of anemia.

## CONCLUSION

Based on the results of the study, mothers' demographic factors like age, education level, income level, and marital status were significantly associated with the occurrence of anemia in mothers attending antenatal care at Fort Portal Regional Referral Hospital.

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Namyalo *et al*

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Namyalo *et al*

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Namyalo *et al*

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