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Prevalence of Anemia and Associated Factors among Pregnant Women Attending Kabgayi Hospital in Rwanda

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Abstract

Anemia is one of the diseases associated with the pregnant women. World Health Organization (WHO) revealed that majority (61.3%) of anemic pregnant women were found in Africa. On the other hand, Rwanda Demographic Health Survey (2015) revealed that 19% are aged between 15 and 19 years old. The purpose of this study therefore, was to identify dietary and morbidity factors associated with anemia among pregnant women attending Kabgayi hospital. The study employed a cross-sectional research design. The target population was 936 pregnant women out of which a sample size of 272 women was obtained using formula of Fisher et al., 2014. Interview guide and structured questionnaire were used as instruments for data collection. The findings revealed prevalence of anemia among pregnant women was 29.4% seen at Kabgayi hospital during the study period. The findings also showed nearly a half of them had moderate anemia (46.25%). The findings from multivariate analysis showed that being single (AOR=2.397, 95% CI :1.214-4.730, P=0.012), being in ubudehe category 1 (AOR=0.198, 95% CI :0.071 – 0.554, p= 0.0020) and 2 (AOR = 0.0.200, 95% CI :0.099 -0. CI.404, p< 0.001, not eating dark green leafy vegetables (AOR = 0.392, 95% CI: 0.198-0.775, 92.6 P<0.007) and not eating meat and fish (AOR=6.368, 95%CI: 2.368-14.104, p<0.001), were factors associated with anemia among pregnant women seek at Kabgayi hospital during the study period. This shows that there is a need to improve the living conditions of pregnant women and to help them to how to choose food items based on their iron contents and remembered to take iron supplement during the whole pregnancy. The paper recommended the government of Rwanda and its development's partners should work in synergy to decrease the magnitude of the disorder among childbearing aged and pregnant women. Besides, police makers and their partners should put in place more programs of sexual and reproductive health to increase knowledge, attitude and practices of pregnant women about the anemia and it consequences for them and their offspring's.

Keywords: *Prevalence, Anemia, Pregnant women, Anemia in pregnancy and Hospital.*

1.1 INTRODUCTION

Anemia among pregnant women becomes a growing issue in health of societal members. Specifically, in developing countries, scientific evidences indicated that women all over the world as 41.8% suffer from anemia. The prevalence in Africa, is estimated to 57.1% meaning near 17.2 million (Benoist *et al*., 2015). In a many research studies, ranging between 16.6 and 95.0% women who were pregnancy were established to have anemia (Melku *et al.,* 2014). Globally, multiples consequences of anemia among pregnant women have be described to be the most aspect associated with health socio-economic development (Benoist *et al.,* 2015). when having anemia, pregnant women's physical activity is reduced, mortality and morbidity arise specifically in those with severe anemia (Benoist *et al.,* 2015). Their newborns are at risk of foetal period, the LBW, delivery process, retardation growth and loss of lives was increased (Ouma *et al*, 2016). This implies that anemia can be linked with other risk which is multi-dimensional. Folate, the lack of vitamin B12 and vitamin A but also intestinal parasitic infections, malaria, chronic diseases were evidenced as the prominent to women that are pregnancy to get some risks related to anemia (Obse *et al*., 2013).

Generally, anemia can be prevented largely and treated easily if timely detected (Obse *et al*., 2013). In order to be effectively managed, the treatment should take into account to both core sources and keeping blood which is effectively based on concentration perspective, prevent and treat its complications. Despite the above fact, the high level of anemia to women who are pregnancy, may bring some issues that can lead to mortality as well as morbidity (WHO, 2015). Also, the relative contribution of associated factors on the occurrence of anemia is not well documented, making very difficult to address the problem.

In Rwanda, there is a need of local information for prevalence and control program to come up of the matter. The information on the dominant as well as other intermediate related to having anemia can be an obstacle even scare especially in a research area for pregnant women (RDHS, 2015). Country wide, studies and health surveys (RDHS) have been citing the southern province as the one with the high proportion of anemia, without thorough information on its causes.

1.2 Problem Statement

During pregnancy, iron deficiency anemia is recognized worldwide as a pertinent factor related to maternal issues combined by fetal period and loss of lives to the new born taken as inadequate feedback results especially in developing countries including Rwanda (WHO, 2015). Developed and developing countries are affected some nutritional disorders that are prevalent like anemia (WHO, 2015).

Basing on the statistics worldwide, anemia among women who are pregnant is to be 41.8%, while 61.3% was established among pregnant women in Africa (WHO, 2011). In Rwanda, nearly 1 in 5 women who are experienced to be in age of reproduction at 15-49 in Rwanda are anemic and mothers intended to be pregnant at risk compared to others (RDHS, 2015). Among women, anemia is more common in South Province of Rwanda (23%) due to diet consumed by them during pregnant and less common in Kigali City or North province (15% each) (RDHS,2015). Therefore, this paper sought to identify dietary and morbidity factors associated with anemia among pregnant women attending Kabgayi hospital in Rwanda.

1.3 Research Objective

The objective of the study was to identify dietary and morbidity factors associated with anemia among pregnant women attending Kabgayi hospital.

2.0 LITERATURE REVIEW

2.1 Prevalence of anemia in pregnant women

According to World Health Organization (WHO, 2011), the general dominant of having anemia to women who are pregnancy exceeded from 41.8% to 61.3% in African countries that was unable to be controlled. The anemic issue in various countries like in India, it was showed that in 1998 to 1999 the statistics presented that women were at 46% in the urban areas while in rural areas women were 54%. A study conducted in India by Aziz Nagar, Rangereddy, Hyderabad (2017) found that prevalence of anemia in pregnancy women used to be 48.3% and it was associated with quality of food nutrients and age of getting pregnant. In, hospital based cross-sectional research undertaken and presented that from 2016 to 2018, various hospitals indicated the evidence that the dominant of having anemia to women who used to be pregnancy were about 20% as perceived by the majority of gynecology (shridevi *et al*., 2018). According to Ahmad et al. (2018), the factors that contribute to having lower level of iron disease can lead to anemia mostly to women who are pregnancy in various countries including Pakistan where out 150 sample women 128 (85.3%) were anemic (Hb<11g/dl), among them 42(32.8%) had mild anemia,82(64.1%) had moderate anemia and 4(3.1%) had severe anemia (Ahmad *et al*.,2018**)**.

In Morocco, Hasswane et al. (2019) stated that the risk factors caused by having a dominant level of anaemia to women who are in pregnancy period indicate to be focused in their period of maternity. They also indicated that 82% of women experienced to have complete blood in their body while 57.6% experienced to be moderate as well as the minority of 0.8% used to have severe as was under investigation (Hasswane *et al*, 2019). In Ethiopia, a deep analysis that summarizes findings of the study conducted country-wide up to January 2017. The key role in the studies that were established the level of Hb by using cross-sectional design and adequate sample size to get study results. The responses got indicated that the most women who are in pregnancy period get 31.66% (Kassa *et al*,2017), whereas, the background information based on EDHS in 2016 has been discovered the prevalence at 24% of respondents as were women.

In Kenya, a hospital cross-sectional research carried out at Pumwani Maternity Hospital (PMH), from 8th June to 18th August 2015, aimed to ascertain women that meet various obstacles while accessing ANC when they are pregnant and revealed that the prevalence was 57 %(Okube *et al*., 2015). A research undertaken in Ugunja Islands, United Republic of Tanzania by Ali et al. (2019) suggested that the majority of women that are attacked by anemia, were raised to 80.8% while other 68.64% indicated that it was in medium range of having such anemia though some get severe disease (Ali *et al.*,2019).

In Rwanda, according to 2014-2015 by DHS, the overall problem that affects women aged between 15 and 49 were at an average rate of 19% and at 23% for pregnant women. A study conducted in the South and North of Rwanda, community based and cross-sectional by design, with objective that indicates the Iron Deficiency (ID) as well as ID anemia to the majority females and indicated to have a dominant issue based on anemia as presented to be 30.9% to youths and 11% in women. That of ID in children was 3.1% as defined by high Total Iron Binding Capacity (TIBC) and 5.9%

as defined by low Serum Ferritin (SF). Similarly, some women as were at the level of 3.0% faced TIBC while women at 4.8% faced low SF (Angel *et al.*, 2017).

2.2 Socio-economic and demographic factors

In terms of pregnant women, the socio-economic status as background information can be measured by age, level of education, marital status, and household income is an important determinant of anemia. In the study conducted at Jinnah Hospital Lahore, Pakistan, monthly income and anemia was significantly associated (Ahmad *et al.,* 2018**).** In India, Vanamala et al .(2018) revealed that there is an association between anemia and lower level of education, and maternal age (20-30 years) which was the most affected maternal age. In Telangana, Shridevi et al. (2018) found that low level of education contributes indirectly to anemia of pregnancy

In Ethiopia a study carried kut at St. Pail's Hospital Millenium Medical College, Addis Ababa, there were no statistical significance about the correlation between anemia and socio-economic and demographic factors (Lesbo *et al*., 2017). On the other hand, a community-based study conducted in the southern Ethiopia showed that low socio-economic class (defined by the financial capacity indicated to a single family members that should secure the welfare of family and well allocated infrastructures that support the living conditions) presented an association that was positive to women that are pregnancy (Lesbo *et al*., 2017). However, the systematic analysis that was performed presented that anemia is a critical issue to women who are pregnancy in Ethiopia, has found statistical significance between anemia and rural area residence (Kassa *et al.,* 2017). In Kenya, in the study conducted at Pumwami Hospital, concluded that increased maternal age (late pregnancy), employment and Middle Upper Arm Circumference (Okube *et al.,* 2015).

2.3 Dietary factors

According to Alzahed et al., (2017), the prevalence of IDA in Saudi Arabia established the principles risk factors that were associated with anemia were inadequate intakes of iron and vitamin C, frequent consumption of tea. This highlight the fact that people should be aware of good nutritional habits that encourage the consumption of iron rich diet such as red meat, food and beverages that increase iron bio-dispensability like vitamin c-rich foods and avoid those which hinder iron bioavailability such as Tea (polyphenol-rich beverages) (Alzahed *et al.*,2017).

In Pakistan, the study found significant association between iron deficiency anemia and red meat intake (Ahmad *et al.*, 2018). In India, Vanamala et al. (2018) did not found any significant association between anemia and dietary patterns as among anemic women, 80% were non vegetarians. This is relevant with the research carried out by Dr.Schrivedi in the department of obstetrics and gynecology of Maheshawara medical college and hospital, Patancheru, Telangana where nutritional habit (Vegetarians versus non vegetarians) did not indicate any correlation with the prevalence of anemia.

In Ethiopia a deep analysis was done, there were none nutritional factors involved in the iron deficiency anemia, the professional people do not effectively provide counseling that help women to shape up their health capacity and prevent against various diseases (Kassa *et al*.,2017**).**In the Lemo district, southern Ethiopia, Authors have used in their study the Dietary Diversity score (DDS) ranking women with low, medium and high; level of food security (secured, sometime meet the lack of food related to getting balanced diet). The lower level of balanced diet got by some

people lead them to having anemia as well as other diseases that attack the human body (Lesbo *et al.*, 2017).

In Kenya, in the study conducted at Pumwani Maternity Hospital, Nairobi, authors have found that not considering iron/folic acid supplementation (IFAS) (AOR = 2.04 ;95% CI = 1.14-3.3.64) ;p =0.016) and mid-upper arm circumferences (MUAC) of less than 23 cm (AOR= 2.52 ;95% CI=1.3.36-4.64; P=0.003) were predictors of anemia (Okube *et al.*,2015).

2.4 Morbidity factors

In India, Vanamala et al. (2012) in their study concluded on the association between anemia and parity and less pregnancy spacing. At Maheshwara Medical College and hospital, Patancheru, Telangana found that multiple pregnancies indirectly contribute to anemia among pregnant women (Shrivedi *et al.*, 2018). In Pakistan, authors have found insignificant the association between anemia and the number of children (multiparty), intestinal parasitic infections (Helminths); high frequency of anemia was found among women in their 3rd trimester of pregnancy than those in 2nd trimester (72% versus 21.3%) (Ahmed *et al*., 2018).

In Ethiopia, the analysis has found statistically significant the association between anemia and gravidity, short inter-pregnancy interval and malaria infection (Kassa *et al*, 2017). A research carried out in the southern Ethiopia established that Antenatal care control, record of excessive menstrual bleeding and inter-pregnancy interval are positively linked with some diseases including anemia (Getahum *et al.*, 2017). In WOLOYITA SODO Town (also southern Ethiopia) in their study based on association between women who are pregnancy and cares got from various clinics which indicated that sometimes identify some parasites diseases that may cause individual bleeding among women specifically in their period of menstruation and experienced as one of the causes of anemia to such women (Lealem *et al*., 2015). The gravidity of three to five and six and above and hookworm infection (Lesbo *et al.*, 2017). At St. Paul's Hospital Millenium Medical college, Addis Ababa, authors found also association between anemia and trimester of pregnancy (second and third) and anemia among pregnant women that have attended ANC (Gebreweld *et al.*, 2018).

3.1 METHODOLOGY

The study employed a cross-sectional research design. The target population was 936 pregnant women out of which a sample size of 272 women was obtained using formula of Fisher et al., 2014. Interview guide and structured questionnaire were used as instruments for data collection. Systematic and simple random techniques were established to get respondents.

4.0 RESEARCH FINDINGS

The overall objective of this paper was to identify dietary and morbidity factors associated with anemia among pregnant women attending Kabgayi hospital in Muhanga district in Rwanda.

4.1 Lifestyle and Eating Habit of Respondents

The life style characteristics of respondents include smoking status, drinking alcohol and Tea drinking, the habit of eating vegetable, fruits, meat, eggs as illustrated in Table 1

Table 1: Lifestyle and dietary characteristics of respondents

Variables	Frequency	Percentage
Tea drinking		
Yes	210	77.2
No	62	22.8
Smoking		
No	272	100
Alcohol drinking		
Yes	109	40.1
No	163	59.9
Consumption of starchy staples =cereals, white roots and tubers		
Yes	165	60.7
No	107	39.3
Consumption of Dark green leafy vegetables		
Yes	199	73.2
No	73	26.8
Consumption of Vitamin A rich fruits and vegetables		
Yes	115	42.3
No	157	57.7
Consumption of Organ meat		
Yes	55	20.2
No	217	79.8
Consumption of Meat and fish		
Yes	56	20.6
No	216	79.4
Consumption of Eggs		
Yes	39	14.3
No	233	85.7
Consumption of Legumes, nuts and seeds		
Yes	109	40.1
No	163	59.9
Consumption of Milk and milk products		
Yes	207	76.1
No	65	23.9

The result summarized in Table 1 on the life style of respondents revealed that the majority 210 (77.2%) drink Tea during pregnancy, none of respondent smoke, and 163 (59.9%) did not take alcohol. Regarding consumption of vegetables and fruits, it was reported that the majority 165(60.7%) of study participants ate cereals, white roots and tubers, 199 (73.2%) ate dark green leafy vegetables while 115(42.3%) ate vitamin A rich fruits and vegetables in the 24 hours preceding the survey. The researcher found that only 55(20.2%), 56(20.6%), 34(14.3%) ate organ meat, meat and fish and eggs respectively in the last 24 before the survey. A total of 109(40.1%) of respondents reported that they ate legumes, nuts and seeds in the last 24 hours before the study. Interestingly, the majority 207(76.1%) of women reported that they took milk or mild products within the last 24 hours prior to the study.

4.2 Pregnancy and Morbidity Related Characteristics

The results on pregnancy and morbidity related characteristics is depicted in Table 2

Table 2: Pregnancy and morbidity related characteristics

Variables	Frequency	Percentage
Number of pregnancies		
1	95	34.9
2	59	21.7
3	52	19.1
4	27	9.9
5	19	7.0
6	20	7.4
History of abortion		
Yes	31	11.4
No	241	88.6
Gestational week of current pregnancy		
Below 12weeks	20	7.4
12 to 24 weeks	70	25.7
24 to 36 weeks	182	66.9
Accomplished Antenatal care visits		
1	67	24.6
2	71	26.1
3	59	21.7
4	75	27.6
Iron supplement intake		
Yes	84	30.9
No	188	69.1
Malaria during pregnancy		
Yes	200	73.5
No	72	26.5
HIV status		
Seropositive	20	7.4
Seronegative	252	92.6
Body mass index (BMI)		
Lower weight	23	8.5
Normal weight	151	55.5
Overweight	67	24.6
Obesity	31	11.4

Out of 272 respondents, 95(34.9%) of respondents revealed that their pregnancy was the first one, 31(11.4%) have had an abortion as indicated in Table 2. The majority of women who participated in this research were in their third trimester 182(66.9%), 75(27.6%) attended at least 4 recommended antenatal care visit, 84 (30.9%) took the iron during pregnancy. Regarding the morbidity, the researcher found that had malaria during pregnancy was common 200(73.5%), 20(7.4%) were tested HIV positive during or before pregnancy, and 31(11.4%) were obese.

4.3 Prevalence of Anemia

The prevalence of anemia to women who are pregnant was presented in this study. To do so, hemoglobin of all participant were taken by laboratory staffs, and anemia in pregnant women was described as hemoglobin (Hb) level <11g/dl,mild anemia for Hb between 10.0 and 10.9 g/dl moderate anemia for Hb between 7.0 and 9.9g/dl; severe when Hb is below 7g/dl. The findings on the prevalence of anemia are presented in Figure 1.

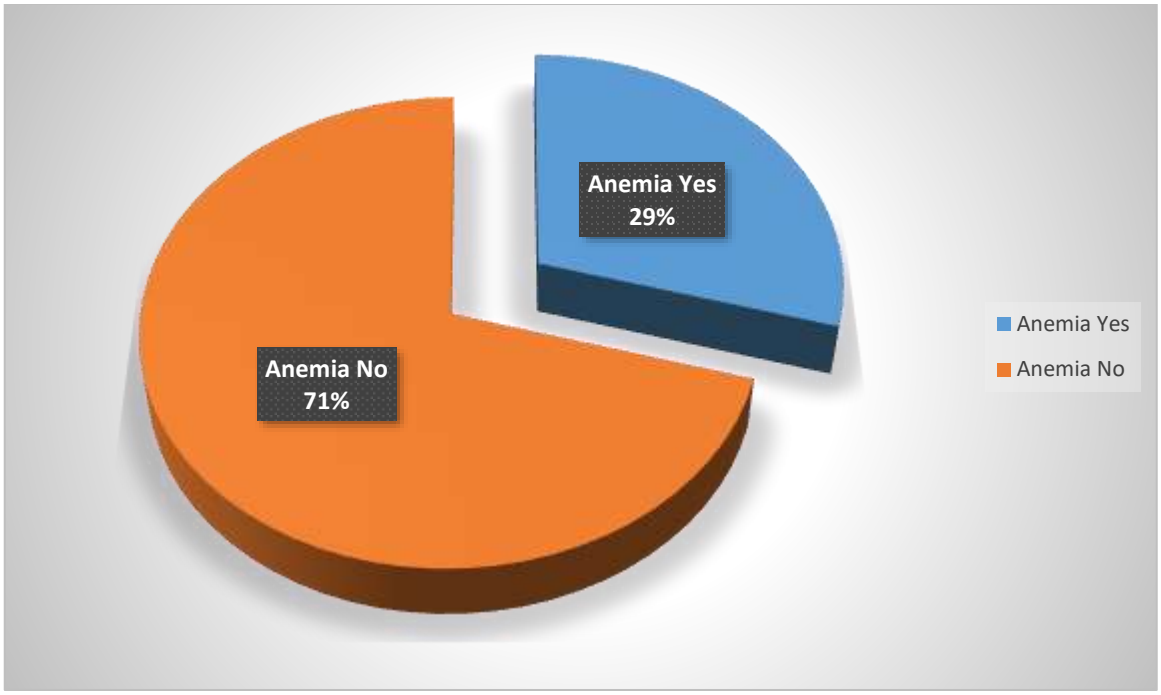

Figure 1: Prevalence of Anemia among pregnant women

The prevalence of anemia was 29% among pregnant women who participated in the study at Kabgayi hospital as shown in Figure 1. This indicated that 80 women had haemoglobin (Hb) level of less than 11g/dl. However, the remaining 71% of women participated in the study was not having anemia. This implies that though, the majority was not having anemia as participated in the study but the prevalence of those who were having anemia was at high level.

Figure 2 presents the severity of anemia among pregnant women

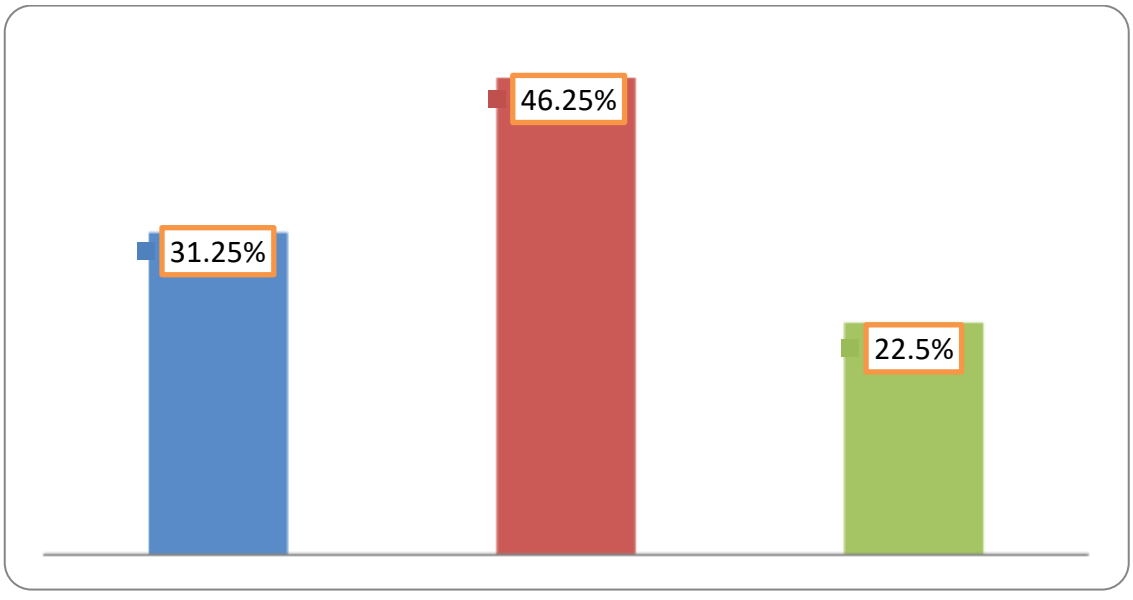

Figure 2: Severity of Anemia among pregnant women

To further understand more details about anemia among pregnant, the research subdivided those with anemia in three groups based on the severity of anemia. The researcher found that out of 80 pregnant women with anemia, 42.25% had moderate anemia, 31.25% had mild anemia while 22.5% had severe anemia (Figure 2).

4.4 Socio-Demographic and Economic Factors associated with anemia

The second research objective was to identify socio-demographic and economic factors associated with anemia among pregnant women seen at Kabgayi hospital during the study period. The outcome presented in Table 3 illustrates the socio-demographic characteristics associated with anemia

Table 3: Socio-Demographic characteristics associated with anemia

Variables	Dependent variable for Gestants		Chi-Square	P-Value
	No n (%)	Yes n (%)		
Age Group			6.749	**0.034**
Less than 21	18(9.4)	5(6.2)		
21-35	135(70.3)	68(85.0)		
35 and above	39(20.3)	7(8.8)		
Marital status			4.272	**0.039**
Single	46(24.0)	29(36.2)		
Married	146(76.0)	51(63.8)		
Occupation			4.478	0.107
Self-employed	56(29.2)	24(30.0)		
Government or private sector employee	56(29.2)	14(17.5)		
Housewife	80(41.7)	42(52.5)		
Education level			0.981	0.612
No formal education	9(4.7)	5(6.2)		
Primary	163(84.9)	64(80.0)		
Secondary and above	20(10.4)	11(13.8)		
Religion			2.891	0.409
Catholic	110(57.3)	53(66.2)		
Protestant	46(24.0)	18(22.5)		
Muslim	13(6.8)	4(5.0)		
Others	23(12.00	5(6.2)		
Ubugehe category			14.969	**0.001**
Category 1	24(12.5)	9(11.2)		
Category 2	93(48.4)	20(25.0)		
Category 3	75(39.1)	51(63.8)		
Drinking alcohol during pregancy			1.145	0.285
Yes	73(38.0)	36(45.0)		
No	119(62.0)	44(55.0)		

Out of 80 pregnant women with anemia 68(85.0%) of them were aged between 21 to 35 years old, 51(63.8%) were married, 51(63.8%) were in ubudehe category three as shown in Table 3. In bivariate analysis, the researcher found the age group (p=0.034), marital status (0.039), and ubudehe category (0.001) indicated to be statistically significance correlation between pregnant women and anemia as seen in Kabgayi hospital. The researcher found that respondent occupation, education level, religion, and alcohol drinking were not significantly associated with anemia in bivariate analysis. Conversely, of 80 women with anemia, 42(52.5%) were housewife as their everyday occupation, 64(80.0%) had only primary education, 53(66.2%) were affiliated to catholic church and 36(45.0%) drink alcoholic beverage during pregnant.

4.5 Dietary, morbidity and maternal factors associated with anemia

The third research objective was to assess dietary, morbidity and maternal factors associated with anemia among pregnant women seen at Kabgayi hospital and results are depicted in Table 4.

Table 4: Dietary, morbidity and maternal features associated with anemia

Variables	Dependent variable for pregnant women Percentage		Chi-square	p-value
	No n (%)	Yes n (%)		
Tea drinking			0.059	0.81
Yes	149(77.6)	61(76.2)		
No	43(22.4)	19(23.8)		
Consumption of starchy staples = cereals, white roots and tubers			0.021	0.885
Yes	117(60.9)	48(60.0)		
No	75(39.1)	32(40.0)		
Consumption of Dark green leafy vegetables				
Yes	44(22.9)	29(36.2)		
No	148(77.1)	51(63.8)	5.113	**0.024**
Consumption of Vitamin A rich fruits and Vegetables			0.049	0.824
Yes	82(42.7)	33(41.2)		
No	110(57.3)	47(58.8)		
Consumption of Organ meat			0.520	0.471
Yes	41(21.4)	14(17.5)		
No	151(78.6)	66(82.5)		
Consumption of Meat and fish			9.836	**0.002**
Yes	30(15.6)	26(32.5)		
No	162(84.4)	54(67.5)		
Consumption of Eggs			0.922	0.337
Yes	25(13.0)	14(17.5)		
No	167(87.0)	66(82.5)		
Consumption of Legumes, nuts and seeds			0.690	0.406
Yes	80(41.7)	29(36.2)		
No	112(58.3)	51(63.8)		
Consumption of Milk and milk products			1.651	0.199
Yes	142(74.0)	65(81.2)		
No	50(26.0)	15(18.8)		
Number of pregnancies			2.822	0.093
1-3	140(72.9)	66(82.5)		
4-6	52(27.1)	14(17.5)		
History of abortion			0.460	0.498
Yes	23(12.0)	12(15.0)		
No	169(88.0)	68(85.0)		
Gestational week of current pregnancy				
Below 12 weeks				
12 weeks to 24 weeks				
24 weeks to 36 weeks				
Antenatal care visits for this pregnancy			2.657	0.448
1	45(23.4)	22(27.5)		
2	47(24.5)	24(30.0)		
3	46(24.0)	13(16.2)		
4	54(28.1)	21(26.2)		
Iron supplement intake			1.530	0.216
Yes	55(28.6)	29(36.2)		
No	137(71.4)	51(63.8)		
Malaria during pregnancy			0.431	0.512
Yes	139(72.4)	61(76.2)		
No	53(27.6)	19(23.8)		
HIV status			1.166	0.280
Seropositive	12(6.2)	8(10.0)		
Seronegative	180(93.8)	72(90.0)		
Body mass index (BMI)			7.782	0.051
Lower weight	20(10.4)	3(3.8)		
Normal weight	98(51.0)	53(66.2)		
Overweight	53(27.6)	14(17.5)		
Obesity	21(10.9)	10(12.5)		

In bivariate analysis, the research found that only eating Dark green leafy vegetables (p=0.024) and meat and fish (p=0.002) were statistically significant correlated with anemia during pregnancy as presented in Table 4. Furthermore, it was found that the majority 51(63.8%) of women with anemia ate dart green leafy vegetables in the last 24 hours proceeding the survey, on other hand the majority 54(67.5%) did not consume food that contain meat and fish in the last 24 hours prior to the survey. They were no relationship found for other features presented in the above diagram with anemia among pregnant women. It was demonstrated that 61(76.2%) among the women with anemia have had at least one episode of malaria during pregnancy, 8(10.0%) among those with anemia were HIV positive and 24(28.0%) of women with anemia were overweight or obese.

Features that were statistically significant in the present analysis were brought to the next level of assessment for deeply the relationship with the dependent variable. The features are presented in Table 5

Table 5: Multi-variate analysis of factors associated with anemia among study participants

Variables	Adjusted Odds Ratio	95% Confidence Interval	p-Value
Age group			
Less than 21	0.652	0.151-2.816	0.566
21-35	2.052	0.788-5.346	0.141
35 and above	Ref.		
Marital status			
Single	2.397	1.214-4.730	**0.012**
Married	Ref.		
Ubugehe category			
Category 1	0.198	0.071-0.554	**0.002**
Category 2	0.200	0.099-0.404	**<0.001**
Category 3	Ref.		
Consumption Dark green leafy vegetables			
Yes	Ref.		
No	0.392	0.198-0.775	**0.007**
Consumption Meat and fish			
No	6.368	2.368-14.104	**<0.001**
Yes	Ref.		

The findings from multivariate analysis presented in Table 5 showed that being single (AOR = 2.397, 95% CI :1.214-4.730 , P = 0.012), being in ubudehe category 1 (AOR=0.198 , 95% CI : 0.071 – 0.554, P=0.020 and 2 (AOR =0.200, 95% CI:0.099 -0.404, P< 0.001, not eating dark green leafy vegetables (AOR = 0.392, 95% CI: 0.198 -0.775,p<0.007), and not eating meat and fish (AOR=6.368, 95% CI :2.368-14.104,p<0.001), were features related to gestants seen in Kabgayi healthcare facility during the study period. The findings revealed that single women are doubly at the risk of dependent outcome while gestant. Unexpectedly, the research found that not eating meat and fish increase the risk of becoming anemic during pregnancy. Women in ubudehe category one and two are less likely to have anemia compared to those in ubudehe category 3. Interestingly, the researcher found that eating dark green leafy vegetables are associated with reduced risk of anemia during pregnancy.

5.0 CONCLUSION

The study concluded that the prevalence of anemia factors among pregnant women is associated with being single, not eating vegetables, consumption of Tea and other beverages were associated with anemia during pregnancy. The researcher found that eating meat and fish decrease the risk of anemia among pregnancy women. Anemia during pregnancy leads to high morbidity and mortality for the gestants. The study also stated that there was a high prevalence of anemia among pregnant women at Kabgayi Hospital.

6.0 RECOMMENDATIONS

The study made the following recommendations;

1. The government of Rwanda and its development's partners should work in synergy to decrease the magnitude of the disorder among childbearing aged and pregnant women.

2. Police makers and their partners should put in place more programs of sexual and reproductive health to increase knowledge, attitude and practices of pregnant women about the anemia and it consequences for them and their offspring's.

3. Single pregnant women should receive sufficient economic support from local government and their partner to ensure that they have the capacity to purchase iron-rich food items like meat, eggs and milk products.

4. Women in Ubudehe category one and two should be given priority and receive more support by all social actors, especially community health workers during their pregnancy.

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