Prevalence and Factors Associated With Anemia among Pregnant Women attending Antenatal Care at Mpigi Health Centre IV. A Cross-sectional study.

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Abstract

Background:
Anemia continues to be a challenging condition and a common condition among many mothers attending antenatal clinics in many hospitals in Uganda. The aim was to ascertain the proportion and factors associated with anemia among pregnant women in Mpigi Health Center IV which serves as a District hospital in Mpigi District.

Methodology:
A cross-sectional study was done in which both qualitative and quantitative research designs were used. 100 respondents were chosen to take part in the study. The data was collected between December 2021 and January 2022

Results:
The study found that the prevalence of Anemia was low. It showed that about 24% and those that presented with mild anemia were 75%. The major risk factors included multiparity, multi gravidity, helminths infections, low standards of living, and poor diet among others.

C onclusion:
Having a well-balanced diet would be good advice as it would greatly reduce the risk of contracting anemia, especially iron-deficiency anemia. This would also require a multisectoral approach were nutritionists, health workers, and the community would be put together to reduce or eliminate anemia in the community among pregnant women.

Recommendation:
After a study, the researcher recommends continuous health education to mothers on the dangers of anemia and its prevention. This could be done majorly during antennal care sessions, continuous deworming during antenatal visits would help to reduce the anemia which is due to infestation with helminth infections.

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1 Background to the study

Worldwide anemia is a health problem and is regarded as a major cause of maternal and fetal morbidity in developing countries. It may lead to premature birth, low birth weight, fetal death, maternal complications such as preeclampsia, antepartum hemorrhages, puperial sepsis, and thromboembolic complications, leading to sub involution of the uterus, failure of lactation, and wound healing. (Felix Bongomin, 2021)

Anemia in pregnancy is hemoglobin levels less than 11.0g/dl and can be classified into three levels of severity: mild anemia (Hb levels 9 to 10 g/dl), moderate anemia (Hb levels 7 to 8.0 g/dl), and severe anemia (Hb levels less than 7 g/dl) (WHO). It is diagnosed by establishing one's hemoglobin (Hb) levels by conducting blood tests. Anemia is caused by many factors including iron deficiency, infec-

tions, genetics, and other nutritional deficiencies. (Gudeta TA, 2018)

The effects of anemia in the population are both short-term and long-term. In pregnant women, anemia is related to poor maternal health and fetal outcomes which may include infections, illness, and possible death for both the mother and the baby.

Many countries have sought support to combat this preventable public health concern. In 2014, a comprehensive plan on maternal, infant, and young child nutrition was approved by the world health assembly, with anemia being one of the global targets for reduction (by 50%) by 2025 and this subsequent alleviation. furthermore, countries including India, Ethiopia, Yemen, Nigeria, Malawi, and Uganda have systematically established investigations to understand the problem in their local contexts to design targeted approaches to combat the condition.(Erica send a lander, 2018)

In Uganda ministry of health has put in place deliberate interventions to improve maternal and child health outcomes through a reproductive, maternal, neonatal, and child health sharpened plan. In addition, with support from the development

partners, the government embarked on several multispectral nutritional interventions that include: the production of biofortified and iron-rich crops, provision of iron, antihelices, and vitamin A supplementation, promotion of breastfeeding, complementary feeding, family planning, delayed cord clamping, intensified malaria prevention and treatment, promotion of hygiene through increased access to water, improved latrines, hand washing, and infectious disease prevention.

Despite multifactorial to reduce the burden of anemia in Uganda the 2016 Uganda demographic and health survey (UDHS) reported that the prevalence of anemia was 53% in children aged 6 to 59 months, up from 49% in 2011 and was 32% in women of reproductive age up from 23% in 2011(Olivia Nankinga, 2019). The objective of this study was to determine the social-economic factors, obstetrical and nutritional factors associated with anemia among pregnant mothers attending antenatal care at Mpigi health center IV.

2 Methodology

Study area

The study was conducted in Mpigi Health Center IV, Mpigi town council Mpigi district. The area was chosen for the study due to the easy access and convenience of the researcher. Mpigi district hospital is located in central Uganda coordinates 0013'30 "N 320 19'19.0" E (Latitude: 0.225004; Longitude: 32.321944). Neighborhoods are Wakiso in the Northeast, Mityana in the north, Butambala in the West, and Kalungu in the southwest. The area was chosen because due to easy access by the researcher and a place of convenience.

Study design

A cross-sectional study design was used to collect both qualitative and quantities data.

Study population

The study population comprised pregnant women aged 15-49 years attending antenatal care at Mpigi Health Center IV.

inclusion criteria

Pregnant women who were at Mpigi HCIV at the time of the study and those who were willing to participate in the study were recruited in the study.

Exclusion criteria

Pregnant women who were selected for the pilot study, those who were not at the facility at the time of the study, and pregnant women who were not able to participate in the study were not included in the study.

Sample size estimation

The sample size was determined using the following method according to Kish Leslie (1965) formula

n=Z2PQ/d2

where Q=I-P

n=required sample size

z=reliability coefficient at 90% coefficient in factual (standard value is 1.96)

P=proportional of target population which is found to be 50%

d= margin of the formula above

n=(1.962x0.5(1-0.5)) ÷ (0.1)2

n=96.04 respondents approx.to 100 respondents

The calculated sample size is 100 respondents.

Sampling procedure

The researcher used a simple random sampling method; 10 days of the month be selected. The sample size of 100 was divided equally among the ten selected days resulting in 10 respondents from each day. Each of the selected days had ten papers labeled YES and the rest NO. Each respondent who picked YES and had consented to be interviewed. The same procedure was adopted for 10 days until the end of the data collection.

Data collection methods and tools

A questionnaire as the major data collection tool was used because this yielded data directly from respondents. Other data collection tools included; ink balls Pens, pencils, papers, and clipboard.

Quality control

To ensure valid and reliable research, the following were done;

Pre visiting

Before the study, the researcher visited the Hospital director to obtain permission to conduct the study from the hospital to eliminate the bias of the respondents about the researcher.

Research assistants

Two research assistants were selected depending on their communication skills, level of education, and knowledge about the topic. They were trained and oriented about the data collection process and then involved in the pre-testing of the questionnaire.

Pilot study and pre-testing of the questionnaire

Before the study, 10 interviewers –were administered questioners to be tested to 10 respondents in the facility and the questionnaire was revised to suit the realities through reconstruction of questions where necessary or not formulated and elimination of the unnecessary question

3 Data analysis and presentation

The researcher edited codes and analyze the data using descriptive statistics such as measures of central tendency, frequency, and percentage. In addition, a computer application package SPSS was used in the analysis of information and reporting data. The researcher used tables to present the analyzed data.

Ethical considerations

Introductory letter

An introductory letter was got from the research committee international Paramedical Institute (IPI) Maya to introduce the researcher to the hospital director Mpigi Health Center IV.

Approval letter

An approval letter from the office of the hospital director was obtained which allowed the researcher to carry out research officially in the hospital.

Informed consent

Verbal consent was obtained from the respondents after an explanation as to why the study was being carried out.

Confidentiality

The researcher and the assistants assured the respondents the information to be collected was to be kept confidential and only be used for academic purposes and their names did not appear anywhere.

4 Data presentation and analysis

Sociodemographic data

From the table above, many of the respondents belonged to the age group of 21-25 years (36/100), the age group of 15-20 years had 26%, 26-30 had 18%, and 31-40 years had 20% while no respondents were above 40 years

On educational background, it revealed that at least 76% of the respondents had reached the secondary level and above i.e., higher education (4%), University level (10%), Diploma level (12%), and Secondary level (50%). 22% had attained elementary primary education while only 2% had never attained formal education.

Based on the educational specialist, 4% were health professionals, 6% were in the administration, 16% were still in their academics and 74% had no field of work academically.

The financial situation is not so good as only 8% of the respondents belonged to the high class, 48% were in the middle class and 44% were still in the lower class.

In the number of years they had spent in marriage, 32% reported that they had at least finished a year in marriage whereas 24% had finished between 2 to 4 years, 22% had finished 5 to 7 years, 8% had finished 8 to 10 years and only 14% had finished over 10 years.

When asked about the age they first entered marriage, 50 % said it was between 13 to 19 years, 44% reported it to be 20 to 25 years, 2% noted it being above 26 years whereas 4 % were not yet married.

From the bar graph, 28% had not yet had any pregnancy, likewise 28% had only one pregnancy previously, 10% had 2 [previously, 12% had at least 3 and 22% had more than 4 previous pregnancies.

20% of the mothers were in the first trimester, 48% in the second trimester and 32% in the third trimester.

Table 1. Table showing the socio demographic representation of the study population

Parameter	Frequency	Percentage
AGE (years)		
15-20	26	26%
21-25	36	36%
26-30	18	18%
31-40	20	20%
>40	0	0%
Total	100	100%
EDUCATIONAL SPECIALITY		
Health profession	04	4%
Administration	06	6%
Academics	16	16%
None	74	74%
Total	100	100%
WORKING STATUS		
House wife	44	44%
Employed	16	16%
Managing small project	36	36%
Total	100	100%
FINANCIAL STATUS		
High	08	8%
Middle	48	48%
Low	44	44%
Total	100	100%
MARRIAGE YEARS (years)		
0-1	32	32%
2-4	24	24%
5-7	22	22%
8-10	08	8%
>10	14	14%
Total	100	100%
AGE OF FIRST MARRIAGE (years)		
13-19	50	50%
20-25	44	44%
>26	02	2%
Not yet married	04	4%
Total	100	100%
EDUCATIONAL BACKGROUND		
Never went to school	02	2%
Primary schooling	22	22%
Secondary schooling	50	50%
Diploma / professional training	12	12%
University	10	10%
Higher education	04	4%
Total	100	100%

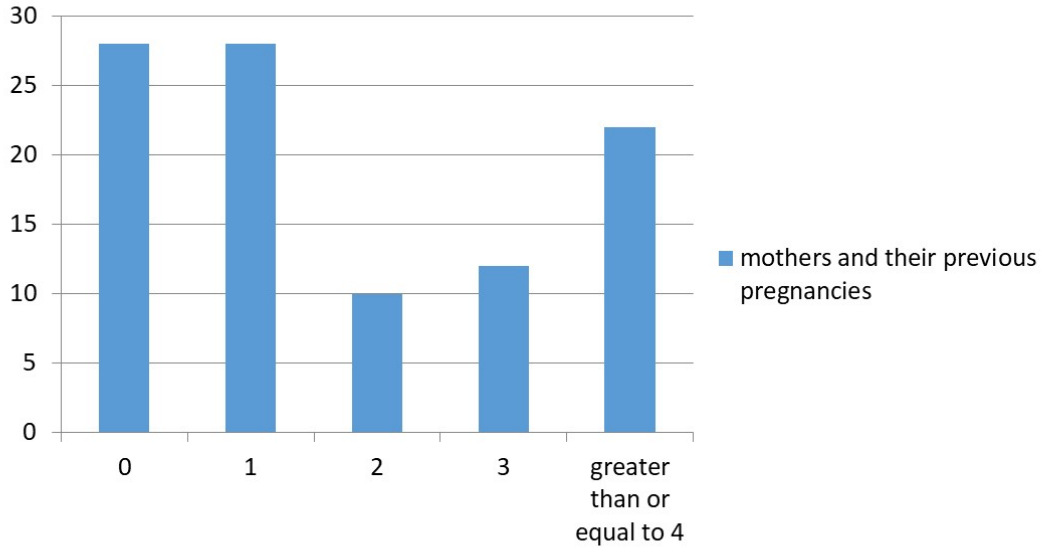

Figure 1. A bar graph showing the number of previous pregnancies.

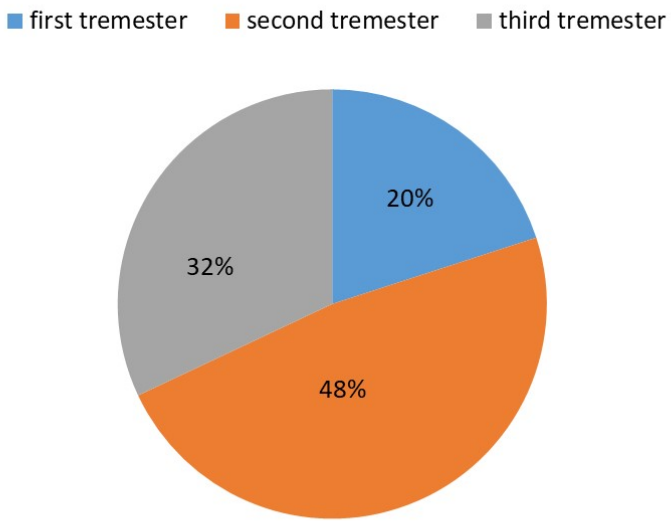

Figure 2. A pie chart showing the trimester each mother was currently in.

Table 2. A table showing responses of the clients

Response	Frequency	Percentage
Have you ever used family planning methods (IUD, Pills and injectable)		
YES	50	50%
NO	50	50%
Total	100	100%
Time span between pregnancies		
< 2 years	44	44%
>2 years	56	56%
Total	100	100%

From the study, a half of the respondents had used some family planning and 56% had taken at least a life span above 2 years and 44% below 2 years.

The study showed that 40% had not had a delivery before, 20% had one previous delivery, 16% had 2 former pregnancies, and 8% had 3 deliveries. While only 16/100 had at least 4 deliveries and above

78% of the respondents had not had any abortion before, 16% had 1 previous abortion, 6% had 3 abortions prior.

The study showed that 76% had a normal hemoglobin level i.e. 11 to 17 gm/dl, 18% had mild anemia i.e. 10 to 10.9gm/dl and 6% had severe anemia i.e. 7 to 9.9gm/dl.

On examining the stool of the respondents, 8% were having hookworm infections and 92% were not having any ova or parasites in the stool.

94% had a Negative HIV Sero status while only 6% had a positive HIV Sero status.

The table above shows the respondents to their meals

The table above showed the practices the respondents did towards controlling anemia.

5 Discussions, Conclusions, and Recommendations

The proportion of anemia during pregnancy

The study showed that the prevalence of anemia among pregnant women in the Mpigi Health Centre IV was 24%. However, a study was done by F Bongmin and R Olum on anemia among pregnant women in Uganda reported that the overall pooled prevalence of anemia among pregnant women in Uganda was 30% and the secondary analysis of data from three consecutive UDHS showed a pooled prevalence of anemia among pregnant women of 43.2% in a period spanning 2006-2016. (Felix Bongomin, 2021) (UDHS 2016)

In the study, mild anemia, moderate and severe anemia accounted for 75% (18/24), 25% (6/24) and 0% respectively was in line with a study done by Birhanu Daba Tulu et al on determinants of anemia among pregnant women attending antenatal care in Horo Guduru Wollega Zone which found that mild anemia was the most prevalent form of anemia accounting for 60% followed by moderate anemia and severe anemia 1%. (Birhuanu DABA Tulu, 2019). However, a study done by Gebreweld A and Tsegaye A on the prevalence and factors associated with anemia among pregnant mothers attending antenatal clinics found that mild, moderate, and severe anemia accounted for 8.8%, 91%, and 0.2% respectively.

Sociodemographic factors associated with anemia.

On social demographic factors associated with anemia, the age group 21 to 25 years had a higher prevalence of anemia (10/24), although age groups 15 to 20 years and 31 to 40 years equally had a high prevalence of 25% each., like ways a study done by Angesom Gebreweld and Aster Tsegaye on prevalence and factors associated with anemia among pregnant mothers attending antenatal clinic reported prevalence of anemia being associated with sociodemographic factors there was variation in ages with 2.4%,29.3%,68.3%for ages <20,20-25,>25years respectively. (Tsegaye, 2018)

In the same way, a study was done by Felix Bongomin and Ronald Olum on anemia in Uganda pregnant women at the national obstetrics and gynecology hospital Kawempe reported that out of the

Table 3. A table showing results from the study

Response	Frequency	Percentage
Number of abortions		
0	78	78%
1	16	16%
2	0	0%
3	6	6%
4 and above	0	0%
Total	100	100%

Table 4. The table showing laboratory findings from the study

Response	Frequency	Percentage
Hemoglobin (gm/dl)		
< 7	0	0%
7 – 9.9	6	6%
10 – 10.9	18	18%
11 – 17	76	76%
Total	100	100%
Stool examination		
Hook worm	8	8%
Enterobius Vermicularis	0	0%
No ova or parasite	92	92%
Total	100	100%
HIV Sero status		
Positive	06	6%
Negative	94	94%
Total	100	100%

Table 5. Table showing food frequency of the respondents

Food item	Daily	2-3 times a week	Weekly once	Monthly once	Rarely	Not at all
Cereals	76%	12%	6%	4%	2%	0%
Rice	54%	38%	2%	4%	2%	0%
Other cereals	44%	34%	16%	2%	2%	2%
Pulses	12%	24%	32%	12%	14%	6%
Green leafy vegetables	28%	46%	18%	1%	2%	5%
Roots and tubers	32%	14%	18%	32%	3%	1%
Other vegetables	26%	54%	5%	12%	1%	2%
Fruits	62%	18%	8%	6%	3%	3%
Meat poultry and fish	14%	28%	8%	6%	42%	2%
Milk and milk products	22%	36%	12%	18%	8%	4%
Fats and oils	68%	12%	8%	8%	4%	2%
Sugars	88%	8%	2%	1%	1%	2%

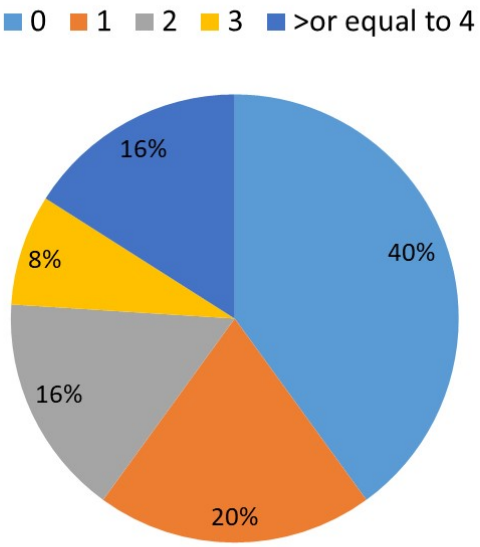

Figure 3. A pie chart showing number of deliveries among respondents

263 eligible participants, the median age was 26 and 59.3% were aged above 25 years and that the majority had attended antenatal for the first time. In the study also of the women were married and had at least a secondary level of education which was in agreement with our study.

On the educational background, those who had attained secondary schooling or below (12/24) had a higher prevalence of anemia. It also agreed with the study by Angesom Gebreweld and Aster Tsegaye that found out that in terms of education level 11% were illiterate, 33.4% for primary level and 48.7%, 6.9%for secondary and tertiary level respectively therefore those with anemia had not attained much education level.

This is also the same for the educational specialist where those who had no specialty constituted 41.7% of the prevalence of anemia. Housewives were 50% of the total prevalent anemia cases while those with a low financial status also constituted 50% of the anemia cases from the study.

The study findings were related to a study done by liyewam on the factors associated with the prevalence of anemia among pregnant mothers that reported that 24.20% were uneducated,45.12% had no occupation,46% perceived long distances to health facilities as a big problem,49.85% used unimproved sources of water,35.62 % had unimproved toilet facilities as a big problem 68.9% of the participant were married,77.83%were from rural communities,49.6%from countries with high illiteracy levels and finally 52% and49%participants were from countries with high poverty levels and low health insurance coverage respectively.(Alemneh Mekuria W liyew, 2021)

On the number spent in marriage, 41.7% had spent less than a year in a marriage whereas those who had their first marriage before 25 years constituted about 91.7% of the total cases of anemia.

The study also showed that 75% of the pregnant had already had a pregnancy above, this indicated anemia is prevalent in multiparous women. Although a study done by Felix Bongomin in Uganda showed that 63.9% of pregnant women were multiparous. Only 4.6% of respondents were in their first trimester. (Felix Bongomin, 2021)

Obstetrical factors associated with anemia in pregnancy.

From the study findings, at least 75% of the cases with anemia were multi porous, 75% were in the second trimester 50% had an interpregnancy period of 2 years, and 75% had not used any family planning method before. However, a study done

Table 6. A table showing the respondents' practice towards control of anemia

Response	Frequency	Percentage
Do you wash your hands with soap and water after defecation?		
YES	98	98%
NO	02	2%
Total	100	100%
Do you wash your hand with soap and water before consuming food?		
YES	96	96%
NO	04	4%
Total	100	100%
Do you wash fruits and vegetables before consuming?		
YES	98	98%
NO	02	2%
Total	100	100%
Do you trim your nails regularly (weekly?)		
YES	94	94%
NO	06	6%
Total	100	100%
Do you walk barefoot outside the home?		
YES	16	16%
NO	84	84%
Total	100	100%
Do you take your folic acid/ferrous sulphate tablets and IPT as directed by the health workers?		
YES	78	78%
NO	22	28%
Total	100	100%

by Romi Bansal and Mini Bedi on prevalence and factors associated with anemia among pregnant mothers attending an antenatal clinic reported 72% of the cases being multigravida, 43.8%were in the second trimester, 50.2% with an interpregnancy interval of 2years, 77%had no history of abortion. Assessment of co-morbid conditions during pregnancy revealed that 56.4% had no illness and 65.9% had BMI of .24.9. (Gudeta TA, 2018)

It also relates to a study done by Fekede Weldekindan and Mesfin Kote on determinants of anemia among pregnant mothers attending antenatal clinics in public health facilities that showed that among pregnant women who were attending antenatal 86(77.5%) cases and 156(70.9%) had the previous history of pregnancy .those who had birth, nearly one-third of the cases,3393(8.4%), and 125(80.1%)controls had a birth interval of more than two years .among those who had a history of birth,53(47.7%)had less than or equal to four children. among the ANC attendances,43(38.7%)cases had a history of contraceptive use. more than half of the ANC attendees,73(65.8%) cases had no heavy menstrual flow history before they became pregnant. Concerning gestation age, the majority of the participant, 50(45%) cases and 93(42%) controls were in the second trimester of their first antenatal care booking).(F Weldekidan, 2018)

Nutritional and dietary habits associated anemia in pregnancy

The study findings showed that most of the women (75%) had a habit of eating additional feeds at least once a week, and eating meat and poultry products also seems to be below. However a study

by Stephen kanegeni Ndegwa on anemia and its associated factors among pregnant women attending antenatal clinics showed the majority, 88(79.3%), of the cases and 20 (9%) of controls were not consuming additional food during the current pregnancy. The majority of the pregnant women who received ANC, 72(64.9%) cases and 77(34.7) control had not eaten meat at least one day per week. regarding the tea/coffee consumption, 83(74.8%) cases and 110(49.5) controls were taking tea /coffee immediately after food every day. (Ndegwa, 2019)

From our study, 65% of the mothers with anemia reported not to be eating green leafy vegetables and a great number did not take their folic acid medications. This is in line with a study done by Gebreweld A and Tsegaye A on the prevalence and factors associated with anemia among pregnant mothers attending antenatal clinics which observed that 39.4% and 58.6% cases did not have a habit of eating green leafy vegetables and meat and animal products respectively .furthermore 49.8% and 78.4% have a habit of drinking tea and coffee immediately after meals respectively .maximum number of subjects (74.8%)had no intake of iron and folic acid tablets and3.5% had no history of pica In the current pregnancy. (Gudeta TA, 2018)

From the study, those with helminths infections constituted 8% and were also a major cause of anemia among those with anemia which was in line with a study done by Tulu BD, Atomssa EM, and MengistHM on determinants of anemia among pregnant women attending antenatal care in Harogudurd Wollega Zone west Ethiopia revealed that low dietary diversity score [12.30%] median dietary diversity score [3.40%] and intestinal helminths infection [6.31%]were significantly associated with anemia during pregnancy.(Tulu BD, 2021) However, it did not agree with a study done by Hylemariam Mihiretie Mengistu et al 2017 it showed that comparatively intestinal helminths were more prevalent in rural residents than residents of urban areas 36.4% versus 21.5% although residence was not a significant risk factor. The prevalence of intestinal helminths s was significantly higher among illiterates where 30.7% of the over infected. Absence of a latrine and eating raw /unwashed fruits were significant predictors of intestinal helminths infection in whom pregnant women were lacking latrines and consumed unwashed fruits regularly.(Hylemariam Mihiretie Mengist, 2017).

After carrying out the study the researcher concluded that the prevalence of anemia among pregnant women in the Mpigi Health Centre IV was 24%. The percentage of mild anemia, moderate anemia, and severe anemia accounted for 75% (18/24), 25% (6/24), and 0% respectively. The age group 21 to 25 years had a higher prevalence of anemia (10/24), although age groups 15 to 20 years and 31 to 40 years equally had a high prevalence of 25% each at least 75% of the cases with anemia were multi porous, 75% were in the second trimester 50% had an interpregnancy period of 2 years, and 75% had not used any family planning method before. This showed that multiparity, second-trimester pregnancies were serious obstetric risk factors of anemia, skipping meals, not eating a well-balanced diet, and helminths infections were serious contributors to anemia in pregnant women.

6 Conclusions

Having a well-balanced diet would be good advice as it would greatly reduce the risk of contracting anemia, especially iron-deficiency anemia. This would also require a multisectoral approach were nutritionists, health workers, and the community would be put together to reduce or eliminate anemia in the community among pregnant women.

Recommendations

The researcher recommends the ministry of health organize health education through the charges and midwives to the pregnant mothers attending antenatal care on the dangers and risk factors of anemia. Carrying out continuous medical education to the staff handling pregnant mothers on anemia and its prevention. Encouraging mothers to have a balanced diet and adding additional meals to their diets. Screening for helminths and deworming pregnant mothers on each antenatal visit. Ensuring mothers get their folic acid supplementations and IPT whenever they come for antenatal care.

Study limitations

Modern researchers are always mistaken to be government agencies or organization spies, therefore, in this case, the respondents might hesitate to provide the information.

Tight schedules since the researcher are expected to balance his time between the research and the demanding course works.

However, for these limitations, the researcher clearly explained in the introductory letter from the institute, the importance of the study so that to make the respondents aware and assured of maximum confidentiality and the researcher ensure proper schedule respectively.

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