

**Prevention of iron deficiency anaemia among pregnant women attending antenatal care at Kajjansi Health Centre IV, Wakiso district. A cross-sectional study.**

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**Abstract**

**Background:**

Iron deficiency anaemia during pregnancy is a major public health concern, particularly in developing countries, and is associated with adverse maternal and fetal outcomes. This study assessed the determinants of prevention of iron deficiency anaemia among pregnant women attending antenatal care at Kajjansi Health Centre IV in Wakiso District.

**Methodology:**

A hospital-based descriptive cross-sectional study was conducted among 96 pregnant women attending antenatal care. Participants were selected using consecutive sampling. Data were collected using semi-structured, self-administered questionnaires and analyzed using Microsoft Excel. Descriptive statistics such as frequencies and percentages were used to summarize the findings.

**Results:**

The majority of respondents were aged 18–29 years (55%), unemployed (62%), married (60%), and multiparous (82%). Knowledge about iron deficiency anaemia was low, with only 30% having heard of the condition and 92% unaware of the benefits of iron and folic acid supplementation. Only 8% reported daily intake of supplements. Socio-economic and cultural factors significantly influenced prevention, with 72% facing financial constraints and 84% reporting cultural restrictions on consuming iron-rich foods. Dietary practices were suboptimal, with only 29% consuming iron-rich foods daily. Health system factors also played a role; although 54% attended antenatal care 3–4 times, 60% reported receiving no education on anaemia prevention, and 60% were not regularly dewormed.

**Conclusion:**

Prevention of iron deficiency anaemia among pregnant women is influenced by inadequate knowledge, socio-economic challenges, cultural beliefs, and gaps in health service delivery.

**Recommendations:**

Strengthening health education during antenatal care, improving access to supplements, promoting community nutrition programs, and addressing cultural barriers are essential to enhance anaemia prevention among pregnant women.

**Keywords:** *Iron deficiency anaemia, Antenatal care, Cultural practices, Kajjansi Health Centre IV.*

**Submitted:** December 03, 2025 **Accepted:** March 25, 2026 **Published:** May 01, 2026

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**Background.**

Anaemia during pregnancy is a public health problem, especially in developing countries, and is associated with adverse outcomes in pregnancy. The World Health Organization (WHO) has defined anaemia in pregnancy as the hemoglobin (Hb) concentration of less than 11 g/dl (Stephen et al., 2018a). Maternal iron deficiency anaemia is a significant and potentially modifiable risk factor for maternal morbidity and mortality, contributing to more than 115,000 maternal deaths globally per year (Edelson et al., 2023). The causes of iron deficiency anaemia during pregnancy in developing countries are multifactorial; these include micronutrient deficiencies of iron, folate, and vitamins A and B12, and parasitic infections such as malaria

and hookworm, or chronic infections like TB and HIV. The contributions of each of the factors that cause anaemia during pregnancy vary due to geographical location, dietary practice, and season. Globally, about 32.4 million pregnant women were anemic, where Southeast Asia and Africa share about 48.7% and 46.3% of the anaemia burden, respectively. The highest rate of iron deficiency anaemia during pregnancy is in the Sub-Saharan region, where 17.2 million pregnant women were reported to be anaemic. Sub-Saharan Africa faces a significant public health challenge with over half (57.0%) of the pregnant women affected by iron deficiency anaemia (Liyew et al., 2021). But in Sub-Saharan Africa, inadequate intake of diets rich in iron is reported as the leading cause of iron deficiency

anaemia among pregnant women (Stephen et al., 2018b). The World Health Organization (WHO) reported that 38.2% of global and 46.3% of pregnant women in the African region are affected by iron deficiency anaemia. For example, in Ethiopia, the prevalence is varied, ranging from 23% to 31.7%, which seems lower than the WHO reports. However, there are reports that depict Ethiopia as one of the countries in which the highest maternal and child mortalities are documented, possibly due to poor maternal services utilization, like micronutrient supplementation (Nasir et al., 2020).

The prevalence of iron deficiency anaemia among pregnant women in eastern Africa was 41.82%, with a significant difference between specific countries, which ranges from 23.36% in Rwanda to 57.10% in Tanzania (Liyew et al., 2021). Despite the availability of free IFA supplementation in many developing countries, including East Africa, compliance with the recommended dosages remains remarkably low, making it challenging to effectively reduce maternal anaemia (Nasir et al., 2020). This study assessed the determinants of prevention of iron deficiency anaemia among pregnant women attending antenatal care at Kajjansi Health Centre IV in Wakiso District.

## Methodology.

### Research Design.

A hospital-based descriptive cross-sectional study design was carried out on the determinants of prevention of iron deficiency anaemia among pregnant women attending antenatal care at Kajjansi Health Centre IV in Wakiso district.

### Study Area.

The study was conducted at the Antenatal Clinic at Kajjansi Health Centre IV, Wakiso District. Kajjansi is a town in central Uganda, located within the Wakiso District and the Central Region. It's situated on the Kampala-Entebbe Road, approximately 16 kilometers south of Kampala, the capital city. It's also about 25 kilometers north of Entebbe International Airport, Uganda's largest civilian and military airport. The coordinates of Kajjansi were: 0°12'54.0"N, 32°33'00.0"E (Latitude:0.2150; Longitude:32.5500).

### Study Population.

The study involved pregnant women attending an antenatal clinic for antenatal care at Kajjansi Health Centre IV, Wakiso district.

### Sample Size Determination.

The sample size was determined using a formula of Kish and Leslie (1965).

$$n = \frac{Z^2 p(1-p)}{d^2}$$

Where N is the sample size.

Z is the z-score at 95% level of confidence.

P is the estimated prevalence of iron deficiency anaemia (30%).

d is absolute precision (the maximum error the investigator will allow between the estimated prevalence and the true prevalence of the problem in the population).

Therefore;

Z = 1.96 (standard normal deviation at 95% confidence interval) P= 50% (taken as a constant since the factors are not known)

d = the standard error, which is 10%

$$\text{So, } n = \frac{(1.96)^2 0.5(1-0.5)}{(0.1)^2}$$

n=96 Pregnant mothers were enrolled in the study.

### Sampling technique.

A consecutive sampling method was employed to select the study participants at Kajjansi Health Centre. This technique was applied because it reduces biased participant selection and gives each individual an equal opportunity to be part of the study.

### Sampling Procedure.

The researcher visited Kajjansi Health Centre IV, identified the hospital in charge, and discussed the study topic. After approval by the In- charge, preceded by the study, every pregnant mother who attended the antenatal clinic and met the inclusion criteria was consecutively contacted for the survey until a total of 96 participants were reached.

### Data Collection Method

Data was collected from the respondents using self-administered questionnaires. The data was collected using a semi-structured questionnaire to collect data on the prevention of iron deficiency anaemia among pregnant women attending antenatal care at Kajjansi Health Centre IV. The questionnaire was used because it ensured a high response rate, time saving, and required less energy to use, as data collection was concerned

### Data Collection Tools.

The data collection process involved the use of semi-structured, self-administered questionnaires with closed-ended questions that were specifically designed to meet the objectives of the study. The questionnaires were written in a simple and straightforward manner to ensure that they were easily understood by both literate and illiterate mothers participating in the study.

### Data collection procedures.

The questionnaires were distributed in person to the participants who had agreed and consented to be part of the study. Clear guidelines and instructions were given to the

participants on how to fill out the questionnaires, and after filling out the questionnaires were collected to monitor the responses of pregnant mothers attending antenatal care. The data collection process involved distributing self-administered questionnaires to gather information, with a requirement for all questions in the questionnaires to be answered. For participants who were illiterate, research assistants provided guidance during the questionnaire completion process, which involved marking small boxes. After completing the questionnaires, participants had the opportunity to ask questions related to the study topic, and responses were provided accordingly. This methodological approach aimed to collect valuable data while upholding participants' rights and ensuring confidentiality throughout the research endeavor.

### **Study variables.**

#### **Independent variables.**

The independent variables in this study will be the level of knowledge, socio-economic and cultural factors, and health system-related factors.

#### **Dependent variable.**

Prevention of iron deficiency anaemia.

### **Quality control**

The research ensured control by:

#### **Piloting the study.**

The researcher conducted a pilot study among a small sample of pregnant women attending Antenatal Care at a health facility outside Kajjansi Health Centre IV, but within the same region. This was to pretest the data collection tools for clarity, validity, and reliability, as well as to assess the feasibility of the study procedures. Feedback obtained was used to revise and refine the questionnaire and methodology where necessary. Data collected during the pilot were included in the main study results.

#### **Inclusion criteria.**

The study included all pregnant women attending ANC who were available at the hospital and consented to participate in the survey, Ugandan and English literate.

#### **Exclusion criteria.**

Those who had already consented, like the very sick and unable to participate in the research, and those who withdraw from the study.

#### **Observation of SOPS**

This involved hand hygiene, social distancing, and hand rubbing to prevent cross-infection and ensured the hospital operating procedures were observed, and avoided hindrance of any hospital activities due to research.

#### **Data analysis and presentation.**

The questionnaires were checked for completeness, clarity, and accuracy, and those that were severely incomplete, with a lot of jargon and abbreviations, were disposed of. The well-filled and completed questionnaires were collected, and the data were manually analyzed using statistical tally sheets and then entered into a computer using Microsoft Excel software. The findings were presented in the form of tables and graphs, including bar charts and line graphs, using Microsoft Excel.

#### **Ethical considerations.**

On approval by the Mildmay Institute of Health Sciences research committee, written permission to conduct the research study was obtained from the principal school of clinical medicine introduction was made to the hospital in charge of Kajjansi health Centre IV, who, in turn, authorized me by authenticating my introductory letter from the Principal of the School of Clinical Medicine, Mildmay Institute of Health Sciences.

The consent of the participants was sought with informed written consent before the study was conducted. A full explanation of the research procedures was given to the participants, ensuring they understood it. Consent forms were used to seek written consent before interviewing. The information provided was kept confidential; the names of the participants were not included anywhere in the report. The participation was voluntary, and one was free to withdraw from the study at any time without any punishment or loss of benefit.

### **RESULTS.**

#### **Socio-Demographic factors contributing to the prevention of iron deficiency anaemia among pregnant women.**

**Table 1: Shows the socio-demographic characteristics of respondents (n=96)**

Question	Frequency	Percentage (%)
<b>1) What is your age?</b>		
a) 18-29	53	55
b) 30-39	25	26
c) 40-49	18	19
<b>Total</b>	<b>96</b>	<b>100</b>
<b>2) What is your religion?</b>		
a) Catholic	40	42
b) Anglican	06	06
c) Muslim	07	07
d) SDA	25	26
e) Born again	18	19
<b>Total</b>	<b>96</b>	<b>100</b>
<b>3) What is your tribe?</b>		
a) Munyankole	14	15
b) Musoga	18	19
c) Muganda	59	61
d) Others	05	05

55% of the respondents were between 18 and 29 years (53), while the least were 19% between 40 and 49 years (18). According to religious affiliations, results revealed that most

42% of the respondents were Catholics (40) and the least were 6% Anglicans (6). Results also showed that 62% of the respondents were unemployed (60), 5% were civil/public

servants (5), and 32% were self-employed (31). According to educational status, 32% of the respondents attended primary (31), 29% attended secondary (28), 10% attended tertiary level (10), and 28% didn't participate in any formal

education (27). 60% of the respondents were married (58), 30% were single (29), and 9% were cohabiting (9). The majority of the respondents were multi parous 82% (79), and 18% had no children (17).

Page | 5 **Knowledge about iron deficiency anaemia among pregnant women attending antenatal care.**  
**Table 2: Shows the respondents' responses on what they knew about iron deficiency anaemia.**

Question	Frequency	Percentage (%)
<b>9) Have you ever heard of iron deficiency anaemia?</b>		
a) Yes	29	30
b) No	67	70
<b>Total</b>	<b>96</b>	<b>100</b>
<b>10) What do you think causes iron deficiency anaemia in pregnancy?</b>		
a) Poor diet	17	59
b) Frequent bleeding	07	24
c) Parasitic infections (e.g., Malaria, hookworms)	05	17
<b>Total</b>	<b>29</b>	<b>100</b>
<b>11) Have you ever experienced any of the following symptoms during pregnancy?</b>		
a) <b>Fatigue</b>	29	30
b) <b>Dizziness</b>	30	31
c) <b>Pale skin</b>	21	22
d) <b>Swelling</b>	16	17
<b>Total</b>	<b>96</b>	<b>100</b>
<b>12) Do you know the benefits of taking iron and folic acid supplements during pregnancy?</b>		
a) Yes	08	08
b) No	88	92
<b>Total</b>	<b>96</b>	<b>100</b>
<b>13) If yes, how often do you take iron and folic acid supplements?</b>		
a) Daily	07	8
b) Sometimes	20	23
c) Rarely	61	69
<b>Total</b>	<b>88</b>	<b>100</b>

From the results in Table 2, 30% of the respondents had ever heard of iron deficiency anaemia (29), while 70% had never

heard about iron deficiency anaemia (67). More than half, 59% of the respondents knew that a poor diet (17) can cause

iron deficiency anaemia, 24% knew about frequent bleeding (7), and 17% knew about parasitic infections (5). 30% of the respondents had ever experienced fatigue as a symptom of iron deficiency anaemia (29), 31% had experienced dizziness (30), 22% had ever had pale skin during pregnancy (21), and 17% had swelling (16). The majority, 92% of the

respondents, never knew the benefits of taking iron and folic supplements (88), and less than or equal to 8% knew about the benefits of taking them (8). Minority, 8% of the respondents took iron and folic acid on a daily basis (7), 23% took it sometimes (20), and the majority, 69%, didn't take it (61).

**Socioeconomic and cultural factors influencing the prevention of iron deficiency anaemia among pregnant women attending antenatal care.**

**Table 3: Shows respondents' responses to different socioeconomic factors contributing to iron deficiency anaemia.**

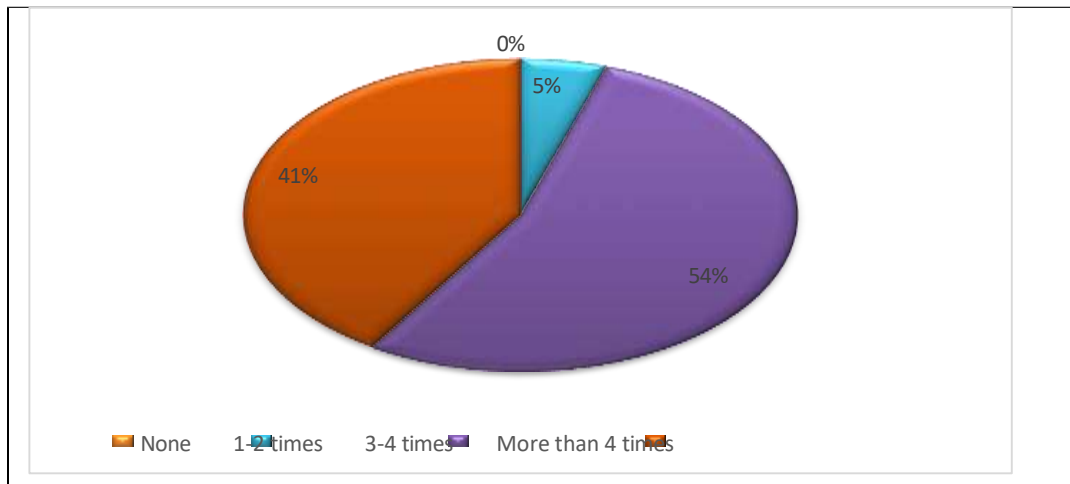
Variable	Frequency	Percentage (%)
1. How often do you eat iron-rich foods?		
Daily	28	30
2-3 times a week	53	55
less than a week	10	10
Never	5	5
2. Does your culture or society have any cultural practices that discourage the consumption of iron-rich foods		
Yes	81	84
No	15	16

29% of the respondents ate iron-rich foods (28), 55% ate 2-3 times in a week (53), 10% less than a week (10), and 5% had never eaten iron-rich foods (5). 84% of the respondents were discouraged by socio-economic and cultural factors from consuming iron-rich food (81), and 16% were not (15).

72% of the respondents faced financial challenges in purchasing iron-rich foods (69), and 28% did not face any economic challenges in this matter (27). 58% of the respondents were affected by their husband's occupation (56), and 42% were not (40).

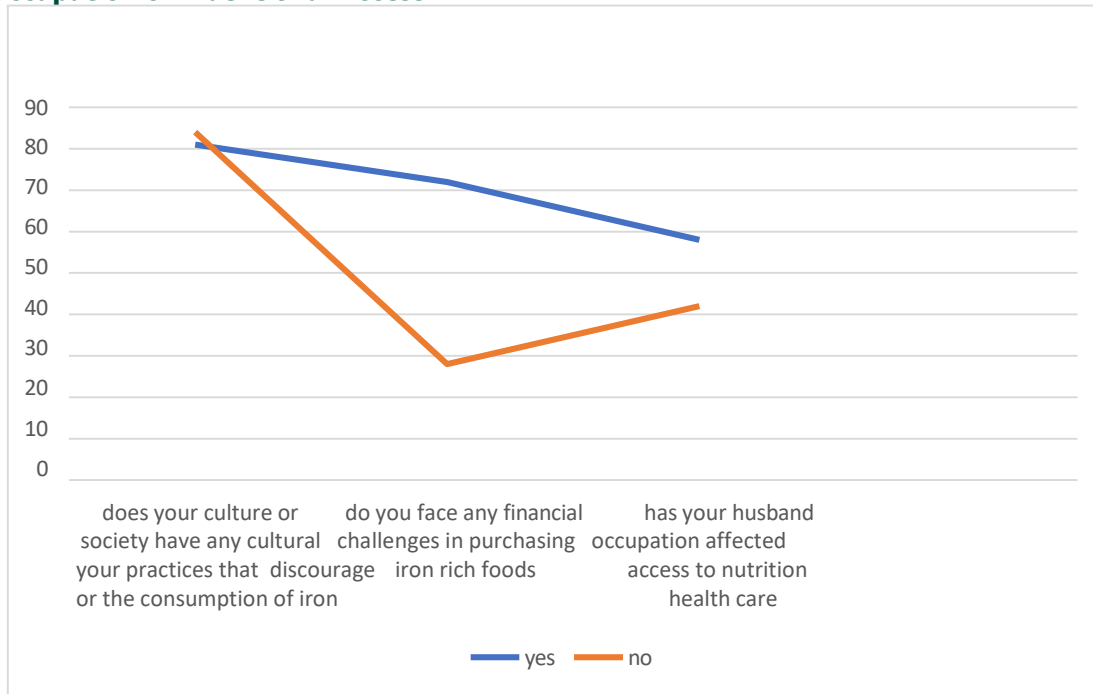
**Health system-related factors affecting the prevention of iron deficiency anaemia among pregnant women attending antenatal care.**

**Figure 4: Showing the number of times respondents attended antenatal care during pregnancy.**



The majority of respondents (54%) attended ANC 3-4 times, 41% did not attend ANC, and 5% attended ANC 1-2 times.

**Figure 5: A line graph showing the Influences of Culture, Finances, and Husband's Occupation on Nutritional Access.**



The majority (84%) of respondents reported that cultural practices discouraged the consumption of iron-rich food, 72% reported that they face financial challenges in purchasing iron-rich food, and 58% reported hindrance of the husband's occupation towards access to nutrition and health care.

**Discussion of findings.**  
**Socio-demographic factors contributing to iron deficiency anaemia among pregnant women attending antenatal care.**

The study revealed that most of the respondents (55%) were aged between 18 and 29 years. This indicated that the majority of pregnant women attending antenatal care were in their young reproductive age. These findings were consistent with a study by a Ugandan, Turyasiima, in 2019, which reported that most women attending antenatal care were below 30 years, reflecting high fertility rates among younger women. Young age is often associated with lower socio-economic empowerment, which may affect health-seeking behavior and dietary intake. Religious affiliation showed that 42% were Catholics, 26% Seventh Day Adventists, 19% Born Again Christians, 7% Muslims, and 6% Anglicans. Religion could influence health practices through dietary restrictions and beliefs. For example, some religious groups discourage consumption of certain iron-rich foods such as pork or liver, which may contribute to anaemia

prevention challenges (WHO, 2021). In terms of tribe, 61% of the respondents were Baganda, 19% Basoga, 15% Banyankole, and 5% other tribes. This reflected the ethnic composition of Wakiso District, which is predominantly from the Buganda region. Tribal and cultural practices could also affect dietary habits, as found in a study in Kenya by Kamau et al. (2018), which reported that cultural food taboos significantly influenced maternal nutrition. Occupation status showed that 63% were unemployed, 32% self-employed, and only 5% civil/public servants. This suggested that the majority of respondents had low income, which limited their ability to access iron-rich foods and supplements. According to Nankinga et al. (2020), unemployment and poverty are key barriers to maternal health and nutrition in Uganda. Regarding education, 32% had completed primary, 29% secondary, 11% tertiary, and 28% had no formal education. This finding showed that a considerable proportion of women had low levels of education, which could affect awareness about anaemia and its prevention. This was consistent with a study in Tanzania by Lweno et al. (2021), which found that low education was significantly associated with poor knowledge and uptake of iron supplements during pregnancy. Most respondents (60%) were married, 30% were single, and 9% cohabiting. Marital status played a role in household decision-making and financial support, which in turn affected access to nutritious food and health care.

Married women may benefit from spousal support, but they may also be restricted by their husbands' decisions, as found in a Nigerian study by Oluwole et al. (2017).

Finally, 82% of respondents had children, with the majority (63%) having more than five children. High parity, where five or more pregnancies reach or exceed 20 weeks of gestation, increases nutritional demands, making women more vulnerable to iron deficiency anaemia. This is consistent with findings by Obai et al. (2016) in Lira District, Uganda, which showed that high parity was strongly associated with maternal anaemia.

### **Knowledge about iron deficiency anaemia among pregnant women attending antenatal care.**

Only 30% of respondents had ever heard of iron deficiency anaemia, while the rest had never heard about it. This indicated low awareness, which made them never think about prevention. Low knowledge levels were found consistent with findings from Ndeezi et al. (2010), who reported that most pregnant women in rural Uganda had limited knowledge about anaemia. Among those aware, 59% identified poor diet as a cause, 24% mentioned frequent bleeding, and 17% cited parasitic infections. This partial knowledge was encouraging but remained inadequate for the community. Similar findings were reported by Geleta et al. (2020) in Ethiopia, where only a minority of women could correctly identify causes of anaemia.

Symptoms reported included dizziness (31%), fatigue (30%), pale skin (22%), and swelling (17%). While these symptoms aligned with clinical signs of anaemia, many women may not attribute them to iron deficiency but rather to other diseases. According to WHO (2017), lack of recognition of anaemia symptoms delays care-seeking and contributes to maternal sickness. Knowledge of the benefits of iron and folic acid supplementation was extremely low, with only 8% aware, and the rest were unaware. Even among those aware, compliance was poor, with only 8% took supplements daily, 23% took them sometimes, and 69% rarely or not at all. This finding was consistent with the Uganda Demographic and Health Survey (UDHS, 2016), which reported poor adherence to supplementation despite availability. Studies in Ethiopia and Kenya also highlighted misconceptions, side effects, and lack of awareness as barriers to compliance (Taye et al., 2019; Kamau et al., 2018).

### **The socio-economic and cultural factors contributing to iron deficiency anaemia among pregnant women.**

The study revealed that only 29% ate iron-rich foods daily, 55% ate 2–3 times a week, 10% less than once a week, and 5% never consumed such foods. This irregular intake was likely due to financial challenges and cultural restrictions in some individuals. Cultural beliefs strongly influenced

dietary practices, as 84% reported restrictions against some iron-rich foods. This was found consistent with a study in eastern Uganda by Obai et al. (2016), which reported that some communities discouraged pregnant women from eating eggs, fish, or meat due to fears of complicated childbirth. Similarly, Kamau et al. (2018) found that cultural food taboos in Kenya negatively impacted maternal nutrition in terms of iron intake. Financial constraints were another significant barrier, with 72% facing difficulties affording iron-rich foods. Poverty reduced dietary diversity, as supported by FAO (2019), which noted that low-income households rely heavily on starchy staples for survival and rarely consume iron-rich foods such as meat and leafy vegetables. Husbands' occupations also influenced access to nutrition, with 58% of women reporting reduced access to quality foods and healthcare. This was found consistent with findings from Oluwole et al. (2017), which emphasized the role of spousal employment and income in maternal nutrition outcomes.

### **Health system-related factors influencing the prevention of iron deficiency anaemia among pregnant women attending antenatal care at Kajjansi Health Centre.**

Antenatal care attendance was relatively high, with 54% attending 3–4 times and 41% attending more than four times. This suggested good utilization of maternal health services, consistent with UDHS (2016) findings that antenatal care attendance has improved in Uganda. However, only 40% reported that healthcare workers explained the importance of anaemia prevention, while 60% said they did not get any explanation. This highlights a gap in health education during Antenatal care visits. Similar gaps were reported by Nankinga et al. (2020), who found that health workers in Uganda often focus on clinical check-ups but provide limited counselling on nutrition. Regarding supplement availability, 88% said folic acid was available, while 12% reported stock-outs. Despite availability, compliance was poor due to a lack of knowledge and fear of side effects, which is consistent with Geleta et al. (2020) in Ethiopia. On deworming, 40% were regularly dewormed, while 60% were not. Given that helminth (parasitic worms) infections contribute to anaemia, inadequate deworming slows down anaemia prevention. This finding agrees with WHO (2017), which recommends routine deworming during pregnancy as part of ANC.

### **Conclusion.**

The study sought to determine the level of knowledge, identify socio-economic and cultural factors, and explore health system-related factors on iron deficiency anaemia among pregnant women. Furthermore, it revealed that education level, age, and level of employment influence the prevention of iron deficiency anemia. Therefore, the study concludes that the prevention of anemia is multifactorial,

requiring health education, socio-economic empowerment, and more decisive system intervention.

### Study limitation.

The study was limited by pregnant mothers' failure to give meaningful information due to the need for payment or incentives and the limited time frame.

### Recommendations.

The study recommends that Kajjansi Health Centre and the Ministry strengthen targeted health education for pregnant women, particularly those in the youthful age group of 18-29 years, who formed the most significant proportion of respondents. Health workers and village health teams should conduct routine ANC health talks and community outreaches that emphasize the importance of iron-rich diets, early ANC attendance, and monthly during community outreach activities to ensure consistent dissemination of information. To improve the low levels of knowledge about iron deficiency anaemia observed among participants, it is recommended that midwives and health educators integrate structured anaemia-focused counselling into every ANC visit. This should include demonstrations of iron-rich foods, an explanation of the causes and symptoms of anaemia, and clear guidance on the importance of iron and folic acid supplements. The use of visual aids and local language materials is essential to accommodate mothers with limited formal education.

Given the strong influence of socio-economic and cultural factors on dietary practices, local government, community leaders, and NGOs should implement community-based interventions to reduce barriers to adequate nutrition. These may include establishing community nutrition gardens, organizing dialogues with cultural and religious leaders to counter harmful food taboos, and linking vulnerable pregnant women to livelihood programs that can improve household food security. Such initiatives should be conducted quarterly, with continuous follow-up during pregnancy to enforce behavior change.

Finally, to address health system gaps affecting anaemia prevention, it's recommended that facility management and the Ministry of Health enhance ANC service delivery by ensuring consistent availability of iron and folic supplements, strengthening deworming practices, and improving the quality of counselling. Health workers should receive supportive supervision and refresher training to ensure proper communication of anaemia-related information, while monthly restocking and adherence monitoring mechanisms should be established to maintain uninterrupted service delivery throughout pregnancy.

### Acknowledgments.

I am deeply grateful to Almighty God for His strength, provision, and guidance that enabled me to complete this research successfully. My sincere appreciation goes to my supervisor, Ms. Nansereko Hasifa, for her dedicated support and valuable advice throughout this work. I also thank the staff and administration of Mild May Institute of Health

Sciences for giving me the opportunity to pursue my diploma in Clinical Medicine.

I extend my gratitude to the administration and staff of Kajjansi Health Centre IV for allowing me to conduct my research and for their cooperation during my attachment. Special thanks to the hospital director and human resource manager for their assistance.

Finally, I appreciate my classmates and friends for their encouragement and companionship, which made this academic journey fulfilling and memorable.

### List of abbreviations.

ANC – Antenatal Care  
FA – Folic Acid  
Hb – Hemoglobin  
IDA – Iron Deficiency Anaemia  
IFA – Iron and Folic Acid  
Kg – Kilogram  
KDHS – Kajjansi Demographic and Health Survey  
MoH – Ministry of Health  
NGO – Non-Governmental Organization  
SPSS – Statistical Package for Social Sciences  
UDHS – Uganda Demographic and Health Survey  
WHO – World Health Organization

### Source of funding.

The study was not funded.

### Conflict of interest.

There is no conflict of interest.

### Availability of data.

Data used in this study are available upon request from the corresponding author.

### The author's contribution.

MSN designed the study, conducted data collection, cleaned and analyzed data, and drafted the manuscript.

HN supervised all stages of the study from conceptualization of the topic to manuscript writing and submission.

FA supervised the entire research process.

JFN supervised the research process.

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