

Perceptions and practices of midwives toward the detection of anemia during first antenatal care visits at Hoima Regional Referral Hospital: a cross-sectional study.
Lillian Najjuko, Jimmy Okwany, Frank Ssemuwemba, Hasifah Nansereko, Jane Frank Nalubega, Immaculate Prosperia Naggulu*
Mildmay Institute of Health Sciences

Page | 1

ABSTRACT

Background:

Anemia in pregnancy is a major cause of maternal and perinatal morbidity, yet early detection at the first antenatal care (ANC) visit is often sub-optimal. This study assessed midwives' knowledge, perceptions, and practices regarding the detection of anemia during first ANC visits at Hoima Regional Referral Hospital, Uganda.

Methodology:

A descriptive cross-sectional study was conducted among 56 purposively selected midwives. Data were collected using a structured interviewer-administered questionnaire. The collected data were analyzed using descriptive statistics in Microsoft Excel and presented as tables and figures.

Results:

Overall, 14 (25.0%) midwives were aged 25–29 years, followed by 12 (21.4%) aged 30–34 years. Half of the midwives (28; 50.0%) held a diploma qualification, while 18 (32.1%) held a certificate. 38 (67.9%) midwives correctly identified the WHO hemoglobin cutoff of 11 g/dL, 48 (85.7%) recognized hemoglobin estimation as the primary diagnostic test, and 32 (57.1%) correctly classified anemia severity. Most (45; 80.4%) knew that hemoglobin testing should be performed at the first ANC visit. Perceptions were highly positive: 50 (89.3%) believed first-visit screening is essential, and 46 (82.1%) supported mandatory testing, while workload and stock-outs were perceived as major barriers by 41 (73.2%) and 45 (80.4%), respectively. In practice, 43 (76.8%) routinely requested or performed hemoglobin tests, 48 (85.7%) assessed pallor, 46 (82.1%) provided iron–folate counseling, and 40 (71.4%) documented results; 44 (78.6%) referred severe anemia.

Conclusion:

Midwives generally demonstrated good knowledge and positive perceptions, but systemic constraints and practice gaps limited optimal detection of anemia at the first ANC visit.

Recommendations:

Strengthening supplies, staffing, refresher training, supervision, and documentation will improve screening and follow-up, with potential to reduce preventable maternal and perinatal complications and enhance the quality of antenatal care in similar low-resource settings.

Keywords: Anaemia, Haemoglobin, Ferritin, Macrocytic anaemia, Pallor, Ferrous Sulphate.

Submitted: December 11, 2025 **Accepted:** May 23, 2026 **Published:** August 01, 2026

Corresponding author: Lillian Najjuko.

Mildmay Institute of Health Sciences.

BACKGROUND

Anemia during pregnancy is a major public health concern globally, particularly in low- and middle-income countries, where it significantly contributes to maternal and perinatal morbidity and mortality (WHO, 2025). According to the World Health Organization (WHO), the prevalence of Anemia among pregnant women is 41.8%, with the highest prevalence (61.3%) in Africa and 52.5% in South East Asia. Sub-Saharan Africa (SSA) is the most affected region, with 17.2 million pregnant women, accounting for 30% of the total global cases (Abdilahi et al., 2024). Anemia in pregnancy, particularly iron-deficiency anemia, is associated with increased risks of preterm delivery, low birth weight, and maternal death (Özyurt & Bulutlar, 2024).

Early detection of anemia during pregnancy is essential to reduce its adverse outcomes. The first antenatal care (ANC) visit provides a critical opportunity for midwives to screen for anemia through history-taking, clinical examination, and laboratory testing (Tancred et al., 2024). According to TCI (2025), early detection and timely management of postpartum anemia are essential to support maternal recovery, reduce fatigue, and promote overall well-being during the critical postnatal period. However, effective detection largely depends on the knowledge, perceptions, and clinical practices of healthcare providers, particularly midwives, who are often the first point of contact for pregnant women.

In Uganda, anemia remains a leading cause of maternal complications. The Uganda Demographic and Health Survey (UDHS) 2016 reported that 14.1% of pregnant

women were anemic, with regional variations noted across the country (Bongomin et al., 2021; USAID, 2019). Midwives play a pivotal role in ANC service delivery at health facilities, particularly in areas such as Hoima. However, there is limited empirical evidence on how midwives perceive anemia detection and how consistently they practice the recommended screening protocols during initial ANC visits.

Several studies have identified knowledge gaps and inconsistent practices among healthcare providers in the screening and management of anemia. For instance, a study in Eastern Uganda found that although most midwives were aware of the risks of anemia, only a few routinely conducted comprehensive assessments during ANC visits due to limited resources, knowledge gaps, and workload constraints (Muwema et al., 2019). Similar findings were reported in a study from Nigeria, which showed that provider attitude and resource constraints greatly influenced anemia screening practices (Onyeneho & Subramanian, 2016).

Given the critical role of early detection in improving maternal outcomes, it is imperative to assess midwives' awareness and practices regarding anemia detection, particularly at the first ANC contact. This study seeks to address this knowledge gap at Hoima Regional Referral Hospital in Hoima City, where maternal health indicators remain below national targets. Understanding these dynamics will inform targeted interventions, training, and policy adjustments to enhance the quality of ANC services and reduce the burden of anemia among pregnant women. This study assessed midwives' knowledge, perceptions, and practices regarding the detection of anemia during first ANC visits at Hoima Regional Referral Hospital, Uganda.

METHODOLOGY

Substitution (e = 0.05)

$$n = \frac{65}{1 + 65(0.05^2)} = \frac{65}{1 + 65(0.0025)} = \frac{65}{1 + 0.1625} = \frac{65}{1.1625} = 55.9139 \approx 56$$

Thus, the study included 56 midwives.

Sampling Technique

The study employed a purposive sampling technique to select midwives from Hoima Regional Referral Hospital. This method was appropriate because it allowed intentional selection of midwives directly involved in providing antenatal care (ANC) and maternity services. Inclusion focused on midwives who had at least six months of working experience in ANC or maternity units and were actively engaged in anemia screening and management during the first ANC visits.

A list of all eligible midwives was obtained from the hospital administration, and only those who met the selection criteria were approached to participate. Fifty-six (56) midwives were purposefully recruited. These

Study Design

A descriptive cross-sectional study design was used, and data were collected using a quantitative method. This design was appropriate because it provided information on the prevalence of midwives' knowledge, perceptions, and practices regarding anemia detection during first antenatal care (ANC) visits. It also enabled the assessment of relationships between variables at a single point in time without requiring follow-up.

Study Area

The study was conducted at Hoima Regional Referral Hospital, located in Hoima District, Western Uganda. The hospital is a Ministry of Health-funded referral facility that provides comprehensive services, including outpatient, inpatient, maternal, and child health care. It serves as the main referral center for the Bunyoro sub-region. It serves a large rural and peri-urban population in Hoima and neighboring districts, including Kibaale, Masindi, Kagadi, and Buliisa. The maternity and antenatal care departments, which receive more than 150 pregnant women monthly, will be the focus of this study. The hospital was selected because of its high maternal service coverage and its strategic role in delivering antenatal services, making it suitable for assessing midwives' knowledge, perceptions, and practices in anemia detection during ANC.

Study Population

The study population comprised midwives working in the ANC, maternity, and postnatal units at Hoima Regional Referral Hospital.

Sample Size Determination

Since the study population (N) is less than 10,000, and the number of Midwives is only 65, adjust using Yamane's formula.

were knowledgeable and experienced in providing ANC services. This approach ensured that the sample comprised individuals capable of providing rich, relevant, and reliable information on perceptions and practices related to anemia detection.

Sampling Procedure

A list of all eligible midwives was obtained from the hospital administration to serve as the sampling frame. Instead of assigning numbers for random selection, the researcher reviewed the list and purposefully identified midwives who met the inclusion criteria, including active involvement in ANC or maternity care and at least six months of experience. Those who fulfilled these criteria

were approached directly and invited to participate until the required sample size was reached.

Inclusion and Exclusion Criteria

The study included midwives who were registered or enrolled and actively working in the ANC, maternity, or postnatal units at Hoima Regional Referral Hospital. Only those with at least 6 months of experience providing ANC services and who were directly involved in screening for and managing anemia during the first ANC visits were considered eligible. Participation was voluntary, and only midwives who provided informed consent were enrolled. Midwives who were on annual, maternity, sick, or study leave during the data collection period were excluded, as were those who did not meet the minimum required experience or declined to participate.

Data Collection Method

Data were collected using structured interviewer-administered questionnaires. The tool included sections capturing socio-demographic characteristics, knowledge, perceptions, and routine practices related to anemia detection during first ANC visits.

Data Collection Tools

A structured questionnaire was used as the primary data collection tool. It consisted of four sections: socio-demographic data, knowledge of anemia detection, perceptions toward early detection, and routine practices. Questions were closed-ended to facilitate quantitative analysis.

Data Collection Procedure

After obtaining necessary approvals, the researcher approached eligible midwives in their respective units. The purpose of the study was explained, consent was obtained, and questionnaires were administered in a quiet and private environment to ensure confidentiality.

Completed questionnaires were checked daily for accuracy and completeness.

Independent Variables

Knowledge, perceptions, and routine practices of midwives regarding anemia detection.

Dependent Variable

Detection of anemia during the first ANC.

Quality Control

Research assistants were trained to ensure consistency in data collection. The questionnaire was pretested at Kigorobya Health Centre IV, and necessary adjustments were made. Daily supervision ensured the completeness and accuracy of data.

Data Analysis and Presentation

Data were cleaned and analyzed manually. Descriptive statistics such as frequencies and percentages were used to summarize the data. Results were presented in tables, charts, and narrative form.

RESULTS

Socio-demographic characteristics of respondents

The results in Table 1 show that most respondents, 14 (25.0%), were aged 25–29 years, followed by 12 (21.4%) aged 30–34 years. Half of the midwives (28; 50.0%) held a diploma qualification, while 18 (32.1%) held a certificate. Regarding experience, 16 (28.6%) had 3–5 years of experience, and 14 (25.0%) had 6–9 years. A larger proportion, 22 (39.3%), worked in the ANC clinic, while 18 (32.1%) were in maternity. More than half (31; 55.4%) reported receiving CPD training on anemia in the past two years.

Table 1: Distribution of respondents by socio-demographic characteristics (n=56)

Variable	Category	Frequency (f)	Percentage (%)
Age (years)	20–24	10	17.9
	25–29	14	25.0
	30–34	12	21.4
	35–39	11	19.6
	40–44	6	10.7
	≥45	3	5.4
Years of Work Experience	<1 year	6	10.7
	1–2 years	10	17.9
	3–5 years	16	28.6
	6–9 years	14	25.0
	≥10 years	10	17.9

Primary Work Unit	ANC	22	39.3
	Maternity/Labour	18	32.1
	Postnatal	6	10.7
	Mixed/Rotates	10	17.9
Received CPD/Training on Anemia (Last 2 Years)	Yes	31	55.4
	No	25	44.6

Figure 1: Distribution of respondents by level of education.

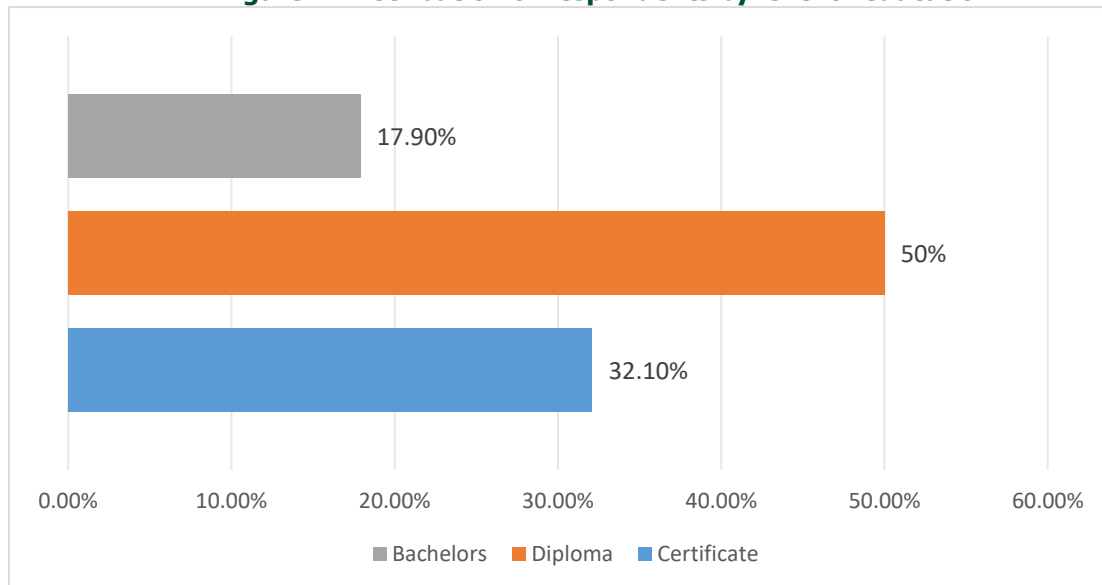


Figure 1 shows that 28 (50.0%) midwives held a Diploma in Midwifery, while 18 (32.1%) held a Certificate-level qualification. A smaller proportion, 10 (17.9%), had attained a Bachelor's degree in midwifery.

Midwives' knowledge of anemia detection at the first ANC visit.

Table 2: Knowledge of midwives on anemia detection during the first ANC visit.

Knowledge Item	Response Category	Frequency (f)	Percentage (%)
WHO Hb cutoff for anemia in pregnancy	11.0 g/dL (Correct)	38	67.9
	Others	18	32.1
Correct first-line test	Hb estimation	48	85.7
	Others	8	14.3
Knowledge of severity classification	Correctly classified all	32	57.1
	Incorrect/partial	24	42.9
Common signs/symptoms identified	Pallor	42	75.0
	Fatigue	34	60.7
	Dizziness	29	51.8
	Dyspnea	22	39.3
Common risk factors identified	Malaria	40	71.4
	Low dietary iron	34	60.7
	Short birth interval	28	50.0
Timing for first Hb test	At first ANC visit	45	80.4

	Others	11	19.6
Need for repeat Hb testing	At least once	39	69.6
	None/others	17	30.4
Complications of untreated anemia	Preterm birth	41	73.2
	Low birth weight	38	67.9
	PPH	31	55.4
Conjunctival pallor is sufficient alone	No (Correct)	44	78.6
Routine supplementation	IFA (Correct)	46	82.1

The results in Table 2 show that 38 (67.9%) respondents correctly identified the WHO hemoglobin (Hb) cutoff of 11 g/dL. A majority (48; 85.7%) correctly identified hemoglobin estimation as the primary diagnostic test. However, only 32 (57.1%) were able to classify anemia severity accurately. Regarding signs and symptoms, pallor (75.0%) and fatigue (60.7%) were commonly identified. Among risk factors, malaria was the most

frequently cited, accounting for 40 (71.4%). Most midwives (45; 80.4%) knew that Hb testing should be performed during the first ANC visit, and 39 (69.6%) recognized the need for at least one repeat test. The majority, 41 (73.2%), understood that preterm birth is a major complication of untreated anemia. Encouragingly, 44 (78.6%) correctly stated that conjunctival pallor alone is not sufficient for diagnosis.

Figure 2: Distribution of respondents by source of anemia knowledge

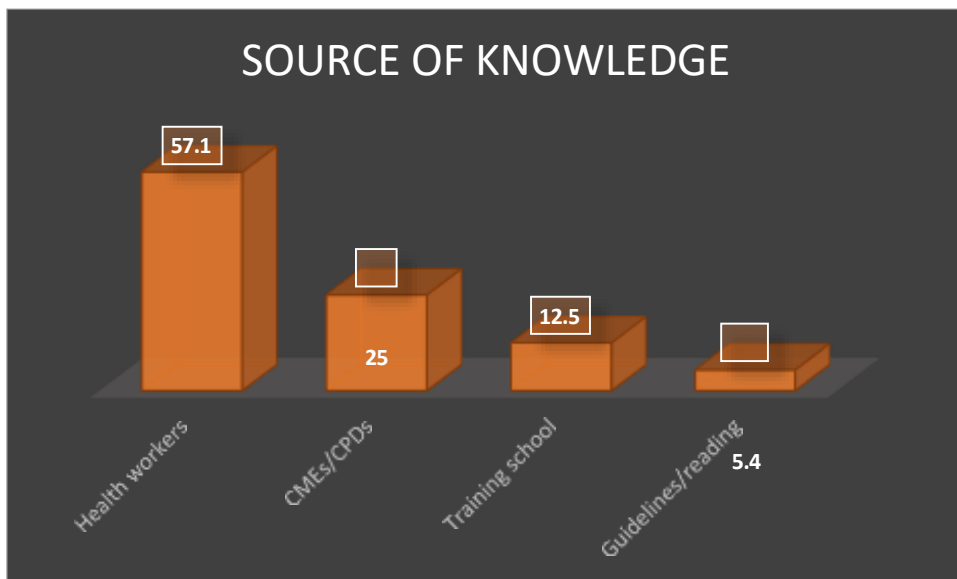


Figure 2 shows that the majority (57.1%), followed by CMEs/CPDs (25%). Smaller proportions reported training schools (12.5%) and guidelines or reading materials (5.4%) as their sources of information.

Perceptions of midwives towards early detection of Anemia

Table 3: Perceptions toward early detection (n = 56)

Characteristics	Response category	Frequency (f)	Percentage (%)
Detecting anemia at first ANC is essential	Yes	50	89.3
	No	6	10.7
Routine Hb testing should be mandatory	Yes	46	82.1
	No	10	17.9
Confident in interpreting Hb results	Yes	34	60.7
	No	22	39.3

Counseling reduces anemia risk	Yes	49	87.5
	No	7	12.5
Workload makes screening difficult	Yes	41	73.2
	No	15	26.8
Stock-outs limit testing	Yes	45	80.4
	No	11	19.6
Screening is necessary even when asymptomatic.	Yes	47	83.9
	No	9	16.1
Referral should be immediate for Hb <7 g/dL	Yes	52	92.9
	No	4	7.1
Documentation should be audited	Yes	44	78.6
	No	12	21.4
More refresher training is needed.	Yes	48	85.7
	No	8	14.3

A large proportion (50; 89.3%) believed that detecting anemia at the first ANC visit is essential. Most respondents (46; 82.1%) supported mandatory Hb testing. However, only 24 (60.7%) were confident in their ability to interpret Hb results. The workload and stock-outs were

perceived as major barriers by 41 (73.3%) and 45 (80.4%), respectively. Nearly all midwives (52; 92.9%) agreed that severe anemia requires immediate referral. Additionally, 48 (85.7%) reported a need for refresher training in anemia management.

Routine Practices of Midwives in Detecting Anemia during the First ANC

Table 4: Routine Practices of Midwives (n = 56)

Characteristics	Category	Frequency (f)	Percentage (%)
Request/perform Hb testing	Yes	43	76.8
	No	13	23.2
Assess conjunctival/palmar pallor	Yes	48	85.7
	No	8	14.3
Provide IFA counseling	Yes	46	82.1
	No	10	17.9
Document Hb results	Yes	40	71.4
	No	16	28.6
Advise repeat Hb testing	Yes	34	60.7
	No	22	39.3
Refer severe anemia cases	Yes	44	78.6
	No	12	21.4
Screened for anemia risk factors	Yes	38	67.9
	No	18	32.1
Provide malaria prevention counseling	Yes	42	75.0

	No	14	25.0
--	----	----	------

The findings in Table 3 indicate that most midwives (43; 76.8%) perform or request hemoglobin (Hb) testing at the first ANC visit. Pallor assessment was common, reported by 48 (85.7%). A total of 46 (82.1%) received counseling on iron and folic acid, and 40 (71.4%) consistently documented hemoglobin (Hb) results. Slightly over half (34; 60.7%) advised repeat Hb testing later in pregnancy. Most respondents (44; 78.6%) referred clients with severe anemia, and 42 (75.0%) routinely provided malaria prevention counseling.

DISCUSSION

Knowledge of midwives regarding anemia detection during first ANC visits

The study found that midwives demonstrated generally adequate knowledge of anemia, particularly regarding the WHO hemoglobin cutoff, first-line diagnostic tests, and complications of untreated anemia. For instance, 67.9 correctly identified the WHO cutoff of 11g/dL, while 85.7 correctly identified hemoglobin estimation as the appropriate confirmatory test. These findings align with the literature, noting that midwives often possess baseline knowledge of anemia but may vary in the accuracy with which they apply diagnostic thresholds (Tancred et al., 2024; Bongomin et al., 2021).

Only 57.1% of respondents correctly classified anemia severity, indicating existing gaps. This pattern is consistent with studies such as Olatunji et al. (2023), which found that only 58% of midwives in Nigeria could accurately classify anemia severity, leading to challenges in the appropriate management. This study similarly suggests that, although foundational knowledge exists, refresher training remains necessary to improve accuracy. Recognition of common signs and risk factors was high, with pallor, fatigue, malaria, and low dietary iron frequently cited. These results mirror findings from Ethiopia and Uganda showing that midwives are aware of anemia-related symptoms but may over-rely on them despite their limited specificity (Fentie et al., 2020; Vyas et al., 2023). The current study also confirms that most midwives understand the complications of untreated anemia, aligning with evidence that adequate knowledge improves prioritization of screening (Coad & Conlon, 2017).

Perceptions of midwives towards the detection of anemia at the first ANC visit

The study revealed highly positive perceptions of early anemia detection. Most midwives (89.3%) believed first-ANC screening is essential, and 82.1% supported mandatory Hb testing where feasible. This agrees with global recommendations emphasizing first-contact screening as critical for preventing adverse maternal outcomes (WHO, 2025). Positive perceptions of counseling, reported by 87.5% of respondents, further align with Ghanaian studies demonstrating that midwives

who value counseling contribute to improved adherence to supplementation (Yeboah et al., 2022).

However, a significant proportion of midwives perceived workload (73.2%) and stock-outs (80.4%) as major barriers. These perceptions echo findings from Uganda's national ANC readiness assessment (MoH Uganda, 2024) and evidence from Kenya indicating that staffing shortages and supply chain inconsistencies limit the availability of consistent Hb testing (Wekesa et al., 2020). Confidence in interpreting Hb results was moderate (60.7%), consistent with observations in Nigeria and Ethiopia, where limited refresher training reduced midwives' diagnostic confidence (Olatunji et al., 2023; Fentie et al., 2020).

The study further found strong agreement (92.9%) with the need for immediate referral for severe anemia, consistent with clinical guidelines that emphasize urgent management for Hb <7 g/dL (Merck Manual, 2023). The widespread perception (85.7%) that refresher training is needed is also supported by evidence from Pakistan, which demonstrated improved competence following structured in-service training (Ali et al., 2024).

Routine Practices of midwives in detecting anemia during first ANC visits

Routine practices varied across essential components of anemia detection. While 78.6% reported conducting or requesting Hb tests, this is lower than the universal screening recommended by WHO (2025). This finding is consistent with Uganda's national statistics, which indicate suboptimal testing coverage at the first ANC visit (MoH Uganda, 2024). A high reliance on pallor assessment (85.7%) is consistent with observations from Ethiopia and Indonesia, where pallor remains widely used despite its limited diagnostic accuracy (Khasanah et al., 2014; Vyas et al., 2023).

Counseling practices were relatively strong, with 82.1% of facilities providing iron and folic acid counseling, consistent with studies showing that effective counseling improves adherence to supplementation (Nankinga & Aguta, 2019). Documentation practices were fair (71.4%), comparable to findings in Ghana, where documentation gaps hampered continuity of care (Tancred et al., 2024). Only 60.7% of participants were advised to repeat Hb testing, consistent with the pattern reported in Ethiopia, where follow-up testing was often overlooked (Gebreweld et al., 2019).

Referral practices were adequate, with 78.6% of cases referred for severe anemia, reflecting awareness of referral protocols recommended by the WHO and the Merck Manual. Screening for risk factors (67.9%) and malaria prevention counseling (75.0%) also align with literature linking malaria and nutrition with anemia risk (Bongomin et al., 2021; Nankinga & Aguta, 2019).

LIMITATIONS

The study was limited to a single hospital, which limited generalizability. Responses could have been affected by social desirability bias, as midwives provided answers they believed were expected.

CONCLUSION

Midwives at Hoima Regional Referral Hospital possess moderate to good knowledge of anemia detection, though gaps remain in the classification of severity and in the comprehensive application of the guidelines. Their perceptions of early detection are positive and aligned with international recommendations; however, systemic barriers, such as supply shortages and heavy workloads, impede optimal practice. Routine practice reflects partial adherence to recommended standards, with reliance on pallor assessment and inconsistent repeat testing indicating areas needing improvement, strengthening capacity, improving resource availability, and reinforcing guideline-based practice are essential to advance early anemia detection during the first ANC.

RECOMMENDATION

Improving anemia detection at first ANC requires ensuring a steady supply of hemoglobin testing materials and adequate staffing to reduce workload pressures on midwives. The Ministry of Health should strengthen regular refresher training and supportive supervision to enhance midwives' competence in screening, interpreting Hb results, and accurately documenting findings. Midwives are encouraged to perform Hb tests consistently, advise repeat testing, and provide

comprehensive counseling on diet, iron-folate supplementation, and malaria prevention. Training institutions and partners should enhance per-service curricula and mentorship programs to build stronger diagnostic skills and support evidence-based ANC practices.

ACKNOWLEDGEMENT

I extend my heartfelt appreciation to my supervisor, Mr. Okwany Jimmy, whose insightful guidance, encouragement, and commitment were instrumental in shaping this study. His constructive feedback and unwavering support provided clarity and direction throughout the entire research process.

My sincere thanks go to the IRC committee for their prompt review and timely clearance, which enabled this study to progress without delays.

I am deeply grateful to the management and staff of Mubende Regional Referral Hospital, the study site, for granting me access and creating a conducive environment for data collection. I also acknowledge the invaluable contribution of the study participants, whose willingness to share their experiences made this work possible.

Special appreciation goes to the Mildmay Institute of Health Sciences for the academic foundation, resources, and continuous support extended throughout my research journey.

Finally, I recognize my classmates, whose encouragement, teamwork, and shared dedication have been a source of strength and motivation. Their support has made this journey both meaningful and memorable.

LIST OF ABBREVIATIONS

ANC	Antenatal Care
Hb	Hemoglobin
IFA	Iron and Folic Acid
IPTp	Intermittent Preventive Treatment in pregnancy (for malaria)
LLIN	Long-Lasting Insecticidal Net
MoH	Ministry of Health
PPH	Postpartum Hemorrhage
SPSS	Statistical Package for Social Sciences
SSA	Sub-Saharan Africa
UDHS	Uganda Demographic and Health Survey
WHO	World Health Organization

FPC	Finite Population Correction (in sample size calculation)
CPD	Continuing Professional Development

SOURCE OF FUNDING

Page | 9 The study was not funded.

CONFLICT OF INTEREST

The author declares no conflict of interest.

AUTHOR CONTRIBUTIONS

LN- Developed and investigated the study.

JO- Supervised the Study.

HN supervised the Study.

FS-Supervised the Study.

JFN-Supervised the Study.

DATA AVAILABILITY

Data is available upon request.

INFORMED CONSENT

There was full disclosure; full comprehension, and respondents voluntarily consented to participate in the study.

AUTHOR BIOGRAPHY

Lillian Najjuko is a student at Mildmay Institute of Health Sciences, pursuing a diploma in Clinical Medicine and Community Health.

Jimmy Okwany is a tutor and research supervisor at Mildmay Institute of Health Sciences.

Hasifah Nansereko is a research supervisor at Mildmay Institute of Health Sciences.

Frank Ssemuwemba is a research supervisor at Mildmay Institute of Health Sciences.

Jane Frank Nalubega is a research supervisor at Mildmay Institute of Health Sciences.

REFERENCES

1. Ali, S., Khan, R., & Ahmed, N. (2024). Structured training and its impact on midwives' practices in antenatal anemia management: Evidence from Pakistan. *International Journal of Gynecology & Obstetrics*, 164(2), 215–223. <https://doi.org/10.1002/ijgo.14789>
2. Bongomin, F., Olum, R., Kyazze, A. P., Ninsiima, S., Nattabi, G., Nakyagaba, L., Nabakka, W., Kukunda, R., Ssekamatte, P., Kibirige, D., Cose, S., Nakimuli, A., Baluku, J. B., & Andia-Biraro, I. (2021). Anemia in Ugandan pregnant women: A cross-sectional, systematic review and meta-analysis study. *Tropical Medicine and Health*, 49(1), 19. <https://doi.org/10.1186/s41182-021-00309-z>
3. Coad, J., & Conlon, C. (2017). Iron deficiency in women: Assessment, causes and consequences. *Current Opinion in Clinical Nutrition & Metabolic Care*, 14(6), 625–634. <https://doi.org/10.1097/MCO.0b013e32834be6fd>
4. Fentie, G., Taye, B., & Woldemichael, K. (2020). Health worker recognition of anemia symptoms among pregnant women in Ethiopia. *African Health Sciences*, 20(2), 930–938. <https://doi.org/10.4314/ahs.v20i2.45>
5. Gebreweld, A., Tsegaye, A., & Taye, B. (2019). Midwives' knowledge and practices regarding anemia in pregnancy in Eastern Ethiopia: A facility-based cross-sectional study. *BMC Pregnancy and Childbirth*, 19, 123. <https://doi.org/10.1186/s12884-019-2242-9>
6. Khasanah, U., Wahyuni, C. U., & Indriasari, R. (2014). Diagnostic value of clinical pallor in detecting anemia during pregnancy in Indonesia. *International Journal of Gynecology & Obstetrics*, 125(3), 256–259. <https://doi.org/10.1016/j.ijgo.2013.12.003>
7. Merck Manual. (2023). *Anemia in pregnancy*. In *Merck Manual Professional Version*. <https://www.merckmanuals.com/professional>
8. Muwema, M., Drake, K., Friesen, P., & Edwards, G. (2019). Cultural assessment: A study of midwives' knowledge, attitude, and self-reported practice in Uganda. *Midwifery*, 79, 102544. <https://doi.org/10.1016/j.midw.2019.102544>
9. Nankinga, O., & Aguta, D. (2019). Determinants of anemia among women in Uganda: Further analysis of the Uganda Demographic and Health Surveys. *BMC Public Health*, 19(1), 1757. <https://doi.org/10.1186/s12889-019-8103-1>
10. Olatunji, A. O., Adebayo, A. E., & Ogunmodede, T. A. (2023). Midwives' knowledge and practices of anemia classification and management in Nigeria. *BMC Health Services Research*, 23(1), 561. <https://doi.org/10.1186/s12913-023-09564-2>
11. Onyencho, N. G., & Subramanian, S. V. (2016). Anemia in pregnancy: Factors influencing knowledge and attitudes among mothers in southeastern Nigeria. *Journal of Biosocial Science*, 48(6), 751–765. <https://doi.org/10.1017/S0021932016000165>
12. Özyurt, R., & Bulutlar, E. (2024). Effect of iron deficiency anemia on fetal and maternal morbidity. *Bagcilar Medical Bulletin*, 9(1), 15–21.

- <https://doi.org/10.4274/BMB.galenos.2024.2024-02-020>
13. Tancred, T., Mubangizi, V., Dei, E. N., Natukunda, S., Abankwah, D. N. Y., Ellis, P., Bates, I., Natukunda, B., & Asamoah Akuoko, L. (2024). Prevention and management of anaemia in pregnancy: Community perceptions and facility readiness in Ghana and Uganda. *PLOS Global Public Health*, 4(8), e0003610. <https://doi.org/10.1371/journal.pgph.0003610>
 14. The Challenge Initiative (TCI). (2025). *Anemia in pregnancy* <https://tciurbanhealth.org/courses/mnchservice-delivery-antenatal-care/lessons/anemia-in-pregnancy/>
 15. Uganda Demographic and Health Survey 2016. Kampala, Uganda, and Rockville, Maryland, USA: UBOS and ICF.
 16. USAID. (2019). *Trends and determinants of anemia in Uganda: Further analysis of the Demographic and Health Surveys*. USAID, DHS Program. <https://www.dhsprogram.com/pubs/pdf/WP149/WP149.pdf>
 17. Vyas, N., Shah, H., Patel, N., & Mehta, P. (2023). Accuracy of clinical pallor for detecting anemia: A systematic review and meta-analysis. *Annals of Global Health*, 89(1), 42. <https://doi.org/10.5334/aogh.4138>
 18. Wekesa, P., Omondi, D., & Wanyama, R. (2020). Barriers to hemoglobin testing and anemia detection in Kenya: A qualitative study of provider experiences. *African Journal of Reproductive Health*, 24(3), 56–64. <https://doi.org/10.29063/ajrh2020/v24i3.7>
 19. World Health Organization. (2025). *Anaemia*. Geneva: World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/anaemia>
 20. Yamane, T. (1967). *Statistics: An Introductory Analysis* (2nd ed.). New York: Harper and Row.
 21. Yeboah, R., Anokye, R., Boateng, D., & Oppong, A. (2022). Midwives' knowledge and perceptions of anemia in pregnancy and their role in prevention in Ghana. *BMC Pregnancy and Childbirth*, 22(1), 543. <https://doi.org/10.1186/s12884-022-05055-8>

PUBLISHER DETAILS

SJC PUBLISHERS COMPANY LIMITED



Category: Non Government & Non profit Organisation

Contact: +256 775 434 261 (WhatsApp)

Email: info@sjpublisher.org or studentsjournal2020@gmail.com

Website: <https://sjpublisher.org>

Location: Scholar's Summit Nakigalala, P. O. Box 701432, Entebbe Uganda, East Africa