

KNOWLEDGE OF ANAEMIA IN PREGNANCY AND PATTERN OF CHRONIC DISEASES AMONG ANTENATAL CLINIC ATTENDEES IN SOUTHWEST NIGERIA

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ABSTRACT

Anaemia affects about one-third of the global population. There has been a steady global rise in the prevalence of chronic conditions among people of all ages, and at least one in every ten pregnant women has a pre-existing medical condition. This study aimed to assess knowledge of anaemia and the pattern of chronic diseases among pregnant women attending the antenatal clinic at a Federal Teaching Hospital, Ido-Ekiti. The study was a descriptive cross-sectional study conducted at the Federal Teaching Hospital, Ido-Ekiti, over a period of three months. A sample size of 277 was determined, and a response rate of 97% was observed during data collection. Study participants were recruited using systematic sampling on each antenatal clinic (ANC) day from August to October, 2023. A semi-structured, interviewer-administered questionnaire on knowledge of anaemia in pregnancy and the pattern of chronic diseases was used to obtain relevant information from the recruited subjects. All collected data were entered into IBM Statistical Package for Social Sciences (SPSS) version 21.0 for analysis. Exact 77.8% of respondents demonstrated a good level of knowledge regarding anaemia in pregnancy, whereas only 22.2% had poor knowledge. The distribution of chronic illnesses among pregnant women showed that hypertension (6.7%), diabetes mellitus (2.6%), and asthma (2.2%) were the predominant chronic conditions. There was good knowledge of anaemia among respondents; there is still a need for continuous health

education to ANC attendees in Nigeria. Pattern of chronic illnesses among pregnant women in this study revealed hypertension in pregnancy as dominant, followed by diabetes mellitus. Improved knowledge of anaemia among pregnant women regarding preventive practices, early detection, and effective management of anaemia and chronic diseases in pregnancy is a crucial step toward reducing multiple pathologies in pregnancy among Nigerian women.

Keywords: Knowledge, Anaemia, Chronic diseases, Pregnancy, Childbearing women, Antenatal Clinic

INTRODUCTION

Anaemia is a common health problem that significantly affects maternal and foetal health in pregnancy, contributing to maternal mortality and poor foetal outcome (WHO, 2014). It is a condition where the number and size of red blood cells, or the haemoglobin (Hb) concentration, fall below a standard reference value for age, sex, and place of residence of the individual (WHO, 2014; Osman *et al.*, 2020). Consequently, anaemia reduces the ability of the blood to transport oxygen around the body (WHO, 2014; Osman *et al.*, 2020). Haemoglobin concentration that fall below 11.0 g/dl or a packed cell volume (PCV) of less than 33.0% is considered anaemia in pregnancy (WHO, 2011). In the tropics, a pregnant woman is considered anaemic if her PCV is less than 30% or her haemoglobin concentration is less than 10 g/dl (Anorlu *et al.*, 2006). A good haemoglobin concentration during pregnancy is important to cater for increased physiological maternal oxygen demand and as a driving force for foetal growth and development (Agan *et al.*, 2010). The causes of anaemia in pregnancy can be linked to decreased red cell production, increased red blood cell destruction or blood loss (Van de Broek *et al.*, 2000). Several risk factors, which may occur individually or in combination, contribute to its occurrence. These include physiological or pathological haemodilution of pregnancy, nutritional deficiencies (most commonly of iron and folic acid) and increased micronutrient demand as seen in multiple pregnancies or short inter-pregnancy intervals. Nutritional deficiencies may develop from insufficient intake as seen in undernutrition, or from issues with nutrient absorption or utilization. Conditions such as Crohn's disease or past surgical procedures like ileal resection can cause impaired nutrient absorption. Common infections in pregnancy, like malaria, hookworm infestation or septicaemia, have also been associated with anaemia. Acute bleeding events, such as ruptured ectopic pregnancies or episodes of antepartum haemorrhage, can result in anaemia. Diminished iron stores due to infections or chronic intestinal ulcers as well as haemoglobinopathies like sickle cell disease, can increase the likelihood of anaemia in pregnant women (Van de Broek *et al.*, 2000).

Anaemia affects about one-third of the global population, is the most common hematologic abnormality diagnosed in pregnancy and is considered a public health problem in areas where the prevalence is higher than 40% (Osman *et al.* 2020; WHO, 2011; Keneni *et al.*, 2018). It is estimated to contribute to more than 115,000 or 20% of all maternal deaths and is also responsible for 591,000 prenatal deaths globally per year. In sub-Saharan Africa, the major causes of anaemia include nutritional deficiencies, malaria, parasitic infections and recent HIV infection (WHO, 2011; Oyelese *et al.*, 2021). About half of the global cases of anaemia have been linked to iron deficiency which is the most prevalent and the most neglected nutrient deficiency in the world. Over 40 million women are said to suffer from iron deficiency and its consequences in developing countries. Iron-deficiency anaemia particularly affects pregnant women and children in developing countries like Nigeria, with a prevalence as high as 56 to 61% (WHO, 2014; Van den Broek *et al.*, 2000)

Anaemia significantly increases the risk of maternal morbidity and mortality. Pregnancy is a state of increased oxygen demand accompanied by profound physiological changes, which make the effects of anaemia more pronounced in pregnant women than in non-pregnant women of similar reproductive age. Evidence suggests that anaemia accounts for approximately 20% of pregnancy-related deaths in many countries (Liyew *et al.*, 2021). Pregnant women with anaemia may experience general fatigue, reduced work capacity, shortness of breath, reduced physical and mental performance, higher risk of heart complications, postpartum haemorrhage and even death. Foetal complications of maternal anaemia include intrauterine growth restriction, preterm delivery, low birth weight, stillbirth, perinatal mortality, low tolerance to infections and long-term cognitive impairment. These complications not only affect the individuals directly involved but also have a widespread impact on national

growth and development (Van den Broek *et al.*, 2000; Liyew *et al.*, 2021; Ugwu & Uneke, 2020; Koyuncu *et al.*, 2017). Anaemia in pregnancy is a vital public health issue in developing nations as it affects over half of pregnant women in these countries (Liyew *et al.*, 2021). It is the most common pregnancy complication in sub-Saharan Africa, while in Nigeria, up to 60% of pregnant women are affected by anaemia, with the most common factors being iron deficiency, folate deficiency, vitamin B12 deficiency, malaria, and other common infections (El Ashiry & El Ghazali, 2014; Buseri *et al.*, 2008). The anaemic condition is compounded by socioeconomic factors such as poverty, poor nutrition, high rate of infectious diseases and inadequate access to healthcare services (Koyuncu *et al.*, 2017). Good knowledge of anaemia, coupled with active preventive practices are vital to reducing the prevalence of anaemia among pregnant women, and may further reduce maternal and neonatal mortality (El Ashiry & El Ghazali, 2014).

Globally, there has been a steady rise in the prevalence of chronic conditions among people of all ages, and at least one in every ten pregnant women has a pre-existing medical condition (Lancet, 2017). Almost 25% of pregnant women in Nigeria have at least one chronic condition (Babah *et al.*, 2018). Pregnancy can both influence and be influenced by pre-existing chronic conditions in women of childbearing age. These conditions—including hypertension, diabetes mellitus, various cardiovascular diseases, and autoimmune disorders—have been associated with an increased risk of pregnancy-related complications, ultimately leading to elevated foeto-maternal morbidity and mortality (Kersten *et al.*, 2014; Brown & McKnight, 2022). Adverse maternal outcomes may include postpartum haemorrhage, extended length of hospital stay and death while adverse foetal outcomes may include stillbirth, Neonatal Intensive Care Unit (NICU) admission and ultimately, neonatal mortality (Ojewale & Olabode, 2024). Higher incidences of preterm birth and caesarean delivery with increased hospitalization rates have also been reported among pregnant women with chronic diseases (Kersten *et al.*, 2014). Hence, pregnant women with these pre-existing conditions have been traditionally managed as high-risk pregnancies with specialised antenatal care services.

Prevention and management of anaemia in pregnancy and chronic diseases during pregnancy require a comprehensive strategy that addresses both the underlying causes and associated risk factors. Improving knowledge of anaemia in pregnancy may empower childbearing women in Nigeria to take informed preventive actions, thereby potentially reducing the burden of anaemia in pregnancy across many African communities. Chronic diseases such as hypertension, diabetes, and cardiovascular conditions are strongly influenced by lifestyle choices and proper approach, as a woman's understanding of antenatal care, nutrition, danger signs, underlying conditions, and hygiene strongly affects her pregnancy outcome. Additionally, understanding the pattern of chronic diseases among pregnant women can help clinicians determine the prevalence of specific conditions during pregnancy and support efficient allocation of clinical resources. When there is adequate knowledge of anaemia alongside a clear understanding of the pattern of chronic medical disorders in pregnancy, there is a greater likelihood of delivering quality, holistic healthcare by caregivers within specific communities. Therefore, this study aimed to assess knowledge of anaemia and the pattern of chronic diseases among pregnant women attending the antenatal clinic of the Federal Teaching Hospital, Ido-Ekiti, Ekiti State, Nigeria. A federal teaching hospital was selected because it is the only tertiary referral centre in Ido-Osi Local Government Area, where women with high-risk pregnancies are often referred due to the availability of specialist care. This ensures that they receive appropriate management, regardless of underlying conditions such as anaemia in pregnancy.

METHODS

Study area and Design

This was a descriptive cross-sectional study conducted at the Federal Teaching Hospital Ido-Ekiti (FETHI) over a period of three months. Ekiti is a state in the South-Western region of Nigeria, bounded on the south by Ondo state, on the North by Kwara state and on the East by Kogi state. The state is situated entirely within the tropics with a total of 16 Local Government Areas (LGAs), including Ido-Osi, where this study was conducted (City-facts, 2015). Ido-Ekiti is a rural town with an estimated population of 37,000, located within Ido-Osi LGA. The town consists of two wards and twenty-two settlements. The main government-owned health facilities in

Ido-Ekiti are the Basic Health Centre, the Comprehensive Health Centre, and the Federal Teaching Hospital. The Federal Teaching Hospital is a 300-bedded facility which provides primary, secondary and tertiary health services in addition to being a clinical training institution for all cadres of health care professionals. It serves as a referral hospital serving other health facilities within Ekiti state, as well as several communities in the neighbouring states. The hospital has 25 departments and a staff strength of about 2,622 (City-facts, 2015). The Antenatal clinic is one of the service units of the department of Obstetrics and Gynaecology, which is being run twice weekly on Tuesdays and Thursdays by specialist medical doctors. The clinic provides services such as health education, nutritional counselling, vaccination, screening (including: high blood sugar, high blood pressure, proteinuria, HIV, Hepatitis B and C, Venereal diseases), and treatment of common diseases in pregnancy. An average of 20 to 30 pregnant women are usually seen in every clinic day.

Study population, sample size determination and sampling technique

The study population comprised all pregnant women attending the Antenatal clinic (ANC) at the Federal Teaching Hospital Ido-Ekiti during the study period (August to October 2023). All pregnant women attending the clinic during the study period, in their first, second or third trimester, within the ages of 15-49 years, irrespective of parity and booking status. The study excluded women that came as guests, severely ill patients, and known patients with Tuberculosis. The minimum sample size was determined using Leslie Fisher's formula for cross-sectional studies (Omigbodun, 2005; Bolarinwa, 2020). Assuming a 95% confidence interval, 5% degree of accuracy and a non-response rate of 10%, a sample size of 277 was gotten after using the prevalence of women with anaemia in pregnancy from a previous study (Sholeye & Animasahun, 2017). Eligible pregnant women were recruited consecutively during each clinic day until the sample size was reached using systematic sampling method.

Ethical considerations

Ethical approval (Protocol No. ERC/2023/07/31/1012B) was obtained from the Human Research and Ethics Review Committee of Federal Teaching Hospital, Ido-Ekiti. Permission to conduct the study was also obtained from the Head of the Department of Obstetrics and Gynaecology. Written informed consent was obtained from all participants after the purpose of the study had been clearly explained to them, and participation was entirely voluntary.

Data collection

A semi-structured, interviewer-administered questionnaire which was adapted from previous studies on the knowledge of anaemia in pregnancy and pattern of chronic diseases, was used to obtain relevant information from the pregnant women who consented to be part of the study (Omote *et al.*, 2020; Ogbeide *et al.*, 1994; Adokiya & Abodoon, 2022). The questionnaire was pretested in a state tertiary facility (EKSUTH) in Ado-Ekiti which is about a 1-hour drive from FETHI. A Cronbach's alpha score of 0.78 was obtained following pretesting, indicating acceptable internal consistency. Face and content validity were ensured by subjecting the questionnaire to review by Community Medicine specialists at FETHI for appropriate evaluation and necessary corrections. The questionnaires were subsequently administered by the researchers via face-to-face interviews with the pregnant women immediately after their clinic visit. An average of 15-17 women were recruited on each clinic day during the 8-week study period.

Data management and statistical analysis

All collected data were sorted, coded and entered into IBM Statistical Package for Social Sciences (SPSS) version 21.0 for analysis. Outcome variables were measured on an ordinal scale. Participants were given "yes", "no" and "I don't know" response options to these items. A correct response to an item was assigned 1 point, while an incorrect answer or "I don't know" response was assigned 0 points. Study participants who scored equal and above 80% score (using a fixed cut-off point of 80%) were considered to have "good knowledge", and those who scored below 80% score were considered to have "poor knowledge" about anaemia in pregnancy. The perception of the

participants towards the causes, complications, and options of management of anaemia in pregnancy was measured using “yes” or “no”. Study participants who scored the median and above on perception were considered to have a “favourable perception”, and those who scored below the median were considered to have “unfavourable perception”. Various chronic diseases previously diagnosed before and during pregnancy were outlined with check boxes and appropriately ticked per participant during data collection. The results of the analysis were presented using tables, diagrams, percentages, and frequency.

RESULTS

A total of 277 questionnaires were administered, out of which 270 were completely filled, resulting in a response rate of about 97.5%.

Table 1: Obstetric history of respondents

Variable	Frequency N = 270	Percentage (%)
Gravidity		
Primigravida	46	17.0
Multigravida	224	83.0
Gestational Age (months)		
1 – 3	32	11.9
4 – 6	157	58.1
7 – 9	81	30.0
History of bleeding during this pregnancy		
Yes	79	29.3
No	191	70.7
If yes, how many times	n = 79	
1	9	11.4
2	14	17.7
3	30	38.0
>3	26	32.9
Number of ANC visits during this pregnancy		
Once	64	23.7
2 times	94	34.8
3 times	44	16.3
> 4 times	68	25.2
History of chronic illness		
Hypertension	18	6.7
Diabetes	7	2.6
Sickle Cell	4	1.5
Asthma	6	2.2
Others	10	3.7

Table 1 shows the obstetric history of respondents. Majority of the respondents were multigravida (83.0%) with about 58.1% in their second trimester. About 29.3% of these pregnant women had history of bleeding during current pregnancy, and 32.9% of these had experienced it more than three times. On attendance of antenatal clinic, 34.8% of the respondents attended ANC just twice while around 25% of subjects attended ANC more than four times

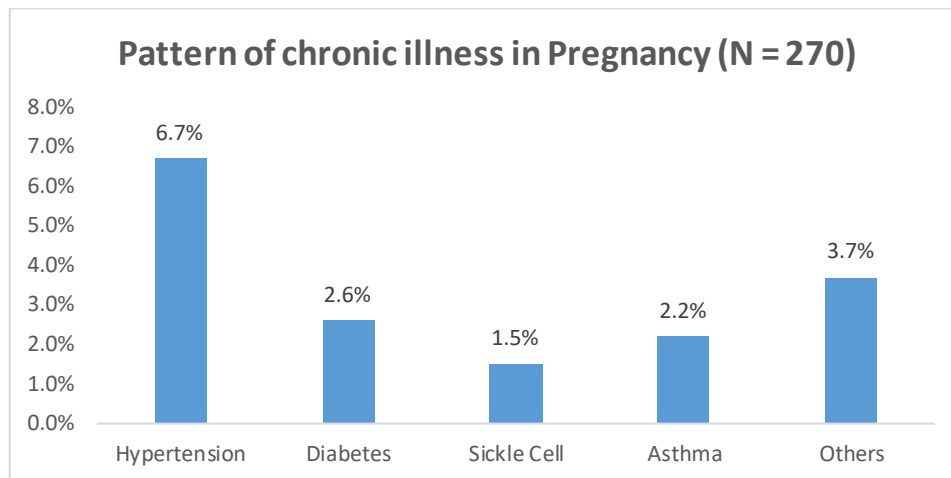


Figure 1: Pattern of chronic illness (N = 270)

Figure 1 illustrates the distribution of chronic diseases among respondents, with hypertension being the most frequently reported condition (6.7%). Not many of the respondents had a chronic illness; however, only 2.6% of respondents had diabetes mellitus, while just 2.2% had asthma.

Table 2a: Respondents' knowledge of anaemia in pregnancy

Variable	Frequency N = 270	Percentage (%)
Knowledge of Anaemia in Pregnancy		
Yes	198	73.3
No	72	26.7
Anaemia is when the capacity of the blood is low for the mother body function and baby's function		
True	236	87.4
False	34	12.6
How can one get anaemia in pregnancy		
Poor dietary intake	232	85.9
Presence of infections	219	81.1
Presence of worms in the stomach	207	76.7
Chronic conditions like tuberculosis	192	71.1
Chronic infections like HIV	216	80.0
Genetic blood diseases	230	85.2
Malaria illness	225	83.3
Abortion can cause anaemia	232	85.9
Someone can know that she is suffering from anaemia if		
Shortness of breath	240	88.9
Awareness of heartbeat	234	86.7
Fatigue/ body weakness	250	92.6
Dizziness	250	92.6
Fainting headaches	245	90.7
Pale tongue	234	86.7
Pale skin	230	85.2
Pale palm	208	77.0

Pale vagina	224	83.0
Anaemia can be prevented		
Yes	259	95.9
No	11	4.1

Table 2b: Respondents' knowledge of anaemia in pregnancy (continued)

Variable	Frequency N = 270	Percentage (%)
The following are ways that anaemia can be prevented		
Eating food that is rich in iron	258	95.6
Taking iron and folic acid supplements	257	95.2
Eating fruits	243	90.0
Deworming before pregnancy	238	88.1
Sleeping under insecticide treated nets	240	88.9
Avoiding any sharp objects that can cut the body while pregnant	247	91.5
Adequate child spacing of at least 2 years interval	238	88.1
Anaemia can be treated		
Yes	251	93.0
No	19	7.0
The following ways are means of treating anaemia		
Herbal concoction	122	45.2
Taking drugs from nurses and doctors	233	86.3
Receiving hospital treatment	232	85.9
Doing nothing	105	38.9
Anaemia can cause serious problems in pregnant mothers and in the baby		
Yes	264	97.8
No	6	2.2
The following are complications of anaemia for both mothers and baby		
Low birth weight	224	83.0
Preterm delivery	240	88.9
Still birth	243	90.0
Heart failure	208	77.0
Infection	199	73.7
I don't know	78	28.9

Table 2 shows the respondents' knowledge of Anaemia in pregnancy. Majority (73.3%) of the respondents had knowledge of anaemia in pregnancy, where 87.4% of them knew that anaemia is a condition characterized by below normal haemoglobin value for mother's body function and baby's function. Majority 85.9% of subjects knew that anaemia can develop from poor dietary intake and abortion. Other ways that were affirmed by many of the respondents how one could get anaemia included presence of infectious agent in the body system, presence of worms in the intestinal tract, infectious conditions like tuberculosis and HIV, as well as malaria illness caused by plasmodium species. Majority of the respondents (92.6%) identified fatigue or body weakness and dizziness as spectacular symptoms of anaemia.

On possible preventive lifestyles against anaemia, more than 95% agreed that anaemia can be prevented. Likewise, about 95.6% agreed that eating food rich in iron can prevent anaemia in pregnancy. Impressive 86.3% identified that taking drugs prescribed by doctors and nurses are part of established ways of treating anaemia, unlike just 38.9% that responded that doing nothing was an option of treating anaemia. Impressively, 97.8% of the pregnant women asserted that anaemia can cause serious problems in pregnant mothers and in the baby.

Table 3: Overall Assessment of knowledge of anaemia in Pregnancy

Variable	Frequency N = 270	Percentage (%)
Knowledge of Anaemia in Pregnancy		
Good ($\geq 80\%$)	210	77.8
Poor ($< 80\%$)	60	22.2
Mean knowledge \pm SD (%)	85.1 \pm 19.3	
Range (%)	5.4 – 100.0	

Shown above (Table 3) is the overall assessment of knowledge among the respondents about anaemia, which was found to be generally high. A cut-off score of greater than or equal to 80% was adopted, and more than 77% of the women were found to have a good level of knowledge, while just 22.2% had poor knowledge.

DISCUSSION

Good knowledge of anaemia can play a significant role in reducing the burden of anaemia among women of childbearing age and pregnant women in Nigeria, supporting early prevention, recognition, and appropriate health-seeking behaviour. This aligns with global public health efforts advocated by the World Health Organisation to reduce anaemia-related morbidity (WHO, 2014). Contrary to the findings of this study in southwest Nigeria, a study in southeast Nigeria found that knowledge of signs and treatment of anaemia was poor, with a score of 10 points out of a 50-point scale, among childbearing women, despite a high score on awareness of anaemia in pregnancy (Onyeneho & Subramanian, 2016). This poor knowledge could have resulted from suboptimal performance of antenatal care providers in the southeast region of Nigeria, where appropriate health hints and health education sessions during antenatal visits were not adequately provided against anaemia in pregnancy during previous visits. Furthermore, this study portrayed a high number of pregnant women with good knowledge of anaemia in pregnancy, possibly because the health workers attending to them during antenatal clinics must have given them effective health education on anaemia and its associated factors in pregnancy. On a similar note, another study that evaluated patients' knowledge on the quality of maternal health services received in Nnewi, southeast, Nigeria, revealed that patients had good knowledge on the quality of services they received (Nnebue *et al.*, 2014). The study also found that the cost of care, use of local language during ANC, staff's attitude, and interactions with patients were all acceptable, which might have also contributed to the high level of patient satisfaction reported among the participants (Nnebue *et al.*, 2014). The observed similarity in good knowledge may be attributed to the practice in many hospitals in Nigeria, including teaching hospitals, of delivering maternal health services in the local dialect of the host community, thereby facilitating better understanding of health information among patients. Another study in Ekiti state, Nigeria, that assessed the quality of focused antenatal care among women attending antenatal clinics in rural and urban primary health care centres revealed that women in the urban areas had slightly higher knowledge on the quality of focused antenatal care than their rural counterparts (Ajayi *et al.*, 2013). The disparity in the show of knowledge among the women in urban areas compared to the rural centres could have resulted from the sub-optimal performance of ANC caregivers in the rural Ekiti than in the urban Ekiti during the time of the study, and the possibility of the workforce in urban centres being more thorough and detailed than their rural counterparts. Such disparities can be modified in the near future by ensuring continuous monitoring and evaluation of the activities of the care providers in primary health care centres across the state.

A study that used a descriptive cross-sectional design and recruited 295 women to evaluate the factors associated with anaemia in pregnancy among women attending primary healthcare (PHC) centres in the Ibeju-Lekki Local Government Area, Lagos State, discovered that over half of respondents (56.3%) were anaemic and that just about 50.5% knew very little about anaemia in pregnancy (Oyewole *et al.*, 2023). Despite the cosmopolitan nature of Lagos, many of the pregnant women still had low knowledge of anaemia in pregnancy unlike the women in the Ido-Osi local government area of Ekiti state which tilted towards rural residential classification, where many of the pregnant women had good knowledge. This is a reflection of the fact that individual medical knowledge or self-care knowledge may not be directly related to the sophisticated nature of cities or towns, but rather the quality of health services provided by the health workforce at any given time. According to research on the causes of anaemia in pregnancy conducted among childbearing women at Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun state, 40.7% of respondents felt that the most frequent way to avoid anaemia in pregnant women is through proper diet (Adekunle & Domero, 2023). Also, the assertion that consuming green leafy vegetables helps to avoid anaemia during pregnancy, and that such are good sources of iron, was asserted by 70.0% of the responders (Adekunle & Domero, 2023). Furthermore, pregnancy-related anaemia may be avoided by consuming foods rich in protein, according to 76.0% of the Sagamu respondents, whereas 58.0% of respondents believed that weakness and lightheadedness are likely symptoms of anaemia during pregnancy (Adekunle & Domero, 2023). Although respondents in our study expressed similar views, many of the participants from Ekiti scored considerably higher than their counterparts from Sagamu on comparable statements overall. This suggests that a larger proportion of childbearing women in Ido-Ekiti possess better knowledge of appropriate dietary practices during pregnancy that can help prevent anaemia in pregnancy compared with their Sagamu counterparts. Future research should identify the factors that positively influence such good knowledge and promote them across many African settings to improve health outcomes for both mothers and their babies.

On the pattern of chronic illness in pregnancy, a similar pattern was seen in a study carried out in Ibadan southwest Nigeria where hypertension ranked highest (23.0%), followed by diabetes mellitus in pregnancy (Ojewale & Olabode, 2024). According to a five-year retrospective study conducted at Lagos University Teaching Hospital, the five most common medical conditions that complicate pregnancy are hepatitis, diabetes mellitus, sickle cell disease, HIV infection, and hypertensive disorders of pregnancy. Over the past five years, there has been little change in the trend (Babah *et al.*, 2018). This pattern persists due to inadequate knowledge among women of reproductive age, as well as socio-cultural factors such as unhealthy dietary practices during pregnancy, risky health behaviors, and delays in seeking early screening. This trend requires urgent attention from clinicians and policymakers, as the implementation of targeted and effective interventions could significantly alter the trajectory of these conditions. Continuous screening of pregnant women throughout antenatal period is very crucial to tackle the advent of comorbidities and chronic illnesses in pregnancy. Mid-level care givers (community health workers and nurses) dominating most Nigerian primary health care centers are better trained on prompt identification of these illnesses, and on the importance of immediate referral to the nearby secondary and tertiary centers where more specialized clinical services to manage such conditions exist in the local area.

CONCLUSION

Although many respondents demonstrated good knowledge of anaemia, there is still a need for continuous health education for antenatal clinic attendees and women of reproductive age, particularly through preconception care, focusing on nutrition, prevention strategies, and the use of locally available foods. Chronic illnesses identified among a small proportion of participants included hypertension in pregnancy, diabetes mellitus, and asthma. Highlighting the importance of strengthening routine screening and incorporating innovative health education methods, such as food demonstrations, target nutrition education into antenatal care practices. Improving knowledge of anaemia and its prevention, alongside early detection and management of chronic conditions in pregnancy, are essential for reducing pregnancy-related health burdens, while further studies may explore its relationship with socio-demographic factors and prevalence across different regions.

DECLARATIONS

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the originality of the work reported in this paper. The study upheld the principles of justice and non-maleficence and upheld autonomy. The study complied with the ethical principles outlined in the Declaration of Helsinki.

CONTRIBUTORS

OJO conceived the idea, reviewed the manuscript, and approved the final submission. OOA wrote the manuscript, supervised the project from beginning to end, and provided technical inputs to the work. TAS facilitated the timely review of the proposal and the full manuscript. SAB reviewed and edited the manuscript. OTA edited the proposal and the manuscript. ROA contributed to the writing of the manuscript, OGM mobilised the team for the field work, and supervised the data collection. OPC helped with data collection and team collaboration. SOO contributed to data gathering. YFA contributed to the funding of the research and data gathering. CSN contributed to research funding and proposal writing. ACS contributed to data gathering and research funding. OCP coordinated the team for field work and contributed to research funding. NCB participated in proposal writing data collection and editing the manuscript.

PATIENT AND PUBLIC INVOLVEMENT

Patients and the public were not involved in the design, but patients participated actively in the conduct of the cross-sectional research. Refer to the Methods section for further details.

PATIENT CONSENT FOR PUBLICATION

Not applicable. Participants gave written informed consent before participating in the study.

DATA AVAILABILITY STATEMENT

Data are available upon reasonable request from the corresponding author.

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