International Journal of Medical and Health Research
www.medicalsciencejournal.com
ISSN: 2454-9142
Received: 07-02-2026, Accepted: 10-03-2026, Published: 25-03-2026
Volume 12, Issue 1, 2026, Page No. 121-127

Dietary practice and nutritional status of pregnant women in flood prone and non-flood prone communities in Rivers State

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Abstract
This study investigated the dietary practice and nutritional status of pregnant women in flood-prone and non-flood-prone communities using a descriptive cross-sectional survey design. The study specifically examined the dietary habits of pregnant women, assessed their nutritional status, and explored the relationship between dietary practices and nutritional indicators. The study was guided by two research questions and one null hypothesis tested at a 0.05 level of significance. The population consisted of pregnant women attending antenatal clinics in selected primary healthcare facilities, with a sample size of 400 respondents determined using the Cochrane formula for sample size calculation. A multistage sampling technique was employed to ensure proper representation of both flood-prone and non-flood-prone communities. Data were collected using two structured questionnaires titled "Dietary Practice Questionnaire" and "Nutritional Status of Pregnant Women Questionnaire," complemented with anthropometric and laboratory measurements of Mid-Upper Arm Circumference (MUAC) and haemoglobin levels. The instruments were validated by experts, and the reliability of the questionnaire was established using the Cronbach Alpha method, yielding a coefficient of 0.86. Descriptive statistics such as frequency and percentage were used to answer the research questions, while Chi-square analysis was employed to test the hypothesis at a 0.05 significance level. Findings revealed that most pregnant women had poor dietary practices, often consuming energy-dense but nutrient-poor foods. The results showed that while about half of the respondents had normal nutritional status based on MUAC, a large proportion were nutritionally inadequate. The study also found high rates of anaemia, particularly among women in flood-prone areas, although no significant relationship was observed between dietary practices and haemoglobin levels. Based on the findings, it was recommended that nutrition education should be intensified during antenatal care, regular nutritional screening should be conducted, and pregnant women should be encouraged to adopt balanced diets rich in essential nutrients for better maternal and child health outcomes.

Keywords: Dietary Practice, nutritional status, pregnant women, flood prone, non-flood prone

Introduction

The saying we are what we eat highlights the link between diet and health, and what a person eats, how it is eaten, and the quality of food consumed play a major role in maintaining health and well being (Adeogun & Adeoti, 2019) [1]. Nutrition involves the intake, digestion, absorption and use of food nutrients for body maintenance, growth and energy, and a person's nutritional status therefore reflects how well the body is nourished based on the adequacy and balance of the diet consumed (Adeogun & Adeoti, 2019; Venkataraman *et al*., 2022) [1, 15]. Dietary practice refers to the food habits or choices made by individuals, while dietary diversity refers to the number of food groups consumed over a period of time (Yalewdeg *et al*., 2020; Venkataraman *et al*., 2022) [15, 18]. Both dietary practice and diversity can be influenced by income, education, culture, food availability, and environmental conditions, and these factors in turn affect nutritional status (Dausayi *et al*., 2019 [5]; Torheim & Arimond, 2013, as cited in Zerfu *et al*., 2016) [19]. Food insecurity, lack of knowledge about nutritious foods, cultural taboos, and gender inequality have all been reported as determinants of poor dietary diversity and practices (Dausayi *et al*., 2019; Berhane *et al*., 2022) [4, 5].

Pregnancy places extra nutritional demands on a woman's body because of the needs of the developing fetus, and the requirement for protein, energy and some micronutrients increases during this period (Nana & Zema, 2018; Kuche, 2014) [10, 12]. Adequate and varied diets during pregnancy help to meet these increased needs and to support the health of both mother and child, reducing the risk of low birth weight, preterm delivery and other adverse outcomes (Palupi *et al*., 2019 [13]; Nnam, 2015, as cited in Wondmeneh, 2022) [16]. Physiological changes during pregnancy, such as increases in plasma volume and fetal weight, further alter nutritional needs (Zhang *et al*., 2021; Dhanashree *et al*., 2020) [6, 20]. Such conditions are associated with higher risks of maternal and neonatal morbidity and mortality (WHO, 2020; Tsegaye *et al*., 2020). Anthropometric measures, including mid upper arm circumference, provide useful indicators of nutritional status during pregnancy, and they can reflect chronic energy and protein imbalance that may affect fetal growth (Venkataraman *et al*., 2022) [15]. Monitoring these measures, together with information on dietary practices, is useful for identifying women at risk of malnutrition and for guiding interventions (Dausayi *et al*., 2019; Venkataraman *et al*., 2022) [5, 15]. Given the persistence of nutrition related risks during pregnancy, and the added pressures that environmental disruption and food insecurity can create, it is important to examine dietary practices and the nutritional status of pregnant women in communities that differ in exposure to such events. This study therefore investigates the dietary practice and nutritional status of pregnant women in flood prone and non flood prone communities,

with the aim of providing evidence to inform actions that support better maternal nutrition and pregnancy outcomes (WHO, 2024; Palupi *et al*., 2019) [13, 17].

Statement of the Problem

Nutrition plays an important role in the health and wellbeing of pregnant women and their unborn babies. Adequate dietary practices help in meeting the nutritional needs required for proper growth, safe delivery, and recovery after childbirth. However, in many communities, particularly those affected by environmental challenges such as flooding, access to nutritious food and stable diets may be disrupted. Flooding often damages farmland, reduces food availability, and limits access to markets, which can affect the nutritional status of pregnant women. In Rivers State, several communities frequently experience flooding, while others remain less affected. These differences may influence the type and quality of food consumed by pregnant women and, consequently, their nutritional wellbeing. Poor dietary practices and inadequate nutrition during pregnancy can lead to complications such as low birth weight, anaemia, and delayed development in infants. Although awareness of proper nutrition during pregnancy has increased, some women still struggle with maintaining balanced diets due to factors such as food insecurity, cultural beliefs, and environmental constraints. Despite the importance of maternal nutrition, there is limited evidence comparing the dietary practices and nutritional status of pregnant women in flood prone and non-flood prone communities in Rivers State. This gap makes it difficult to understand how environmental factors influence maternal health. Therefore, this study investigates the dietary practices and nutritional status of pregnant women in flood prone and non-flood prone communities in Rivers State.

Aim and Objectives of the Study

The aim of the study was to investigate the dietary practice and nutritional status of pregnant women in flood prone and non-flood prone communities in Rivers State. Specifically, the study seeks to:

1. Determine the dietary practices of pregnant women in flood prone and non-flood prone communities in Rivers State.
2. Examine the nutritional status of pregnant women in flood prone and non-flood prone communities in Rivers State

Research Questions

The following research questions were posed to guide the study:

1. What are the dietary practices of pregnant women in flood prone and non-flood prone communities in Rivers State?
2. What is the nutritional status among pregnant women in flood prone and non-flood prone communities in Rivers State?

Hypotheses

The following null hypotheses were formulated and tested at a 0.05 level of significance:

1. There is no significant relationship between nutritional status and dietary practices of pregnant women in flood prone and non-flood prone communities in Rivers State.

Methodology

The study's design was a descriptive cross-sectional survey design. It is a type of study that examines the prevalence of a condition in a defined population at a specific point in time. The design allowed the researcher to collect data from a large sample of pregnant women at a specific point. The study was carried out in four Local Government Areas (Ahoada West, Ahoada East, Emuoha and Ikwerre) of Rivers State. The population for this study was all pregnant women attending antenatal clinics in the selected Primary healthcare facilities in the study area during the period of this study. A sample size of 368 respondents was selected for the study. Given the prevalence of malnutrition among pregnant women in Nigeria to be 36% (National Bureau of statistics [NBS] and National Population Commission [NPC] 2016 [19] as cited by Adeogun & Adeoti, 2019) [1], the sample size for this study was determined using Cochrane formula for calculation of sample size for proportions as follows:

$n = Z^2pq/e^2$

where n = sample size, Z = standard normal deviation usually set at 1.96% which corresponds to 95% confidence level, p = proportion of the target population estimated to have the characteristics being measured which is in this case 36%, q = 1-p and e = level of statistical significance set which is 0.05.

By substitution we have that

$n = 1.96^2 \times 0.36\ (1-0.36)/0.05^2$

$= (3.8416 \times 0.2304)/(0.0025)$

$= 354$

Therefore, n = 354

Considering the possibility of non-response, 10% of the calculated sample size was added to make up for the loss.

10% non-response rate

$=354 \times 10\%$

$=354 + 35.4$

$= 389.4$

Therefore, this is then rounded up to 400. So, the sample size targeted for the study is 400 pregnant women from the flood and non - flood impacted communities. Out of the sample of 400 respondents only 368 returned duly completed questionnaires.

Sampling Technique

Multistage sampling technique was used. This is so to accommodate the different sampling techniques at various stages.

Stage I: Two Senatorial districts are involved. Rivers West and Rivers East were purposively selected. Rivers East represented non - flood prone while Rivers West represented flood prone.

Stage II: Two LGAs each were randomly selected from each Senatorial districts to represent flood prone (Ahoada East and Ahoada West) and non-flood prone LGAs (Emuoha and Ikwerre) making it four LGAs.

Stage III: A sampling frame of the PHC facilities in the selected flood and non – flood prone LGAs was constructed with information collected from the PHC coordinators of the selected LGAs. Sixteeen (16) health facilities that were selected randomly by balloting: Ahoada East (MPHC

Ahoada, Ihuaje, Ula – Ehuda and Edeoha); Ahoada West (Akinnima, Okarki, Upatabo, Okogbe); Emuoha (Ogbakiri, Rumuji, Ndele and Rumuwehor) and Ikwerre (Omagwa, Igwuruta, Igwuruta 2 and Aluu).

Stage IV: Stratified proportionate random sampling was employed to determine the number of respondents from the selected flood prone and non-flood prone LGAs based on their population.

Stage V: Pregnant women who registered for Antenatal services in the selected PHC facilities that were not in exclusion listwere recruited one after the other in each PHC until the sample size for the PHC was reached.

Inclusion Criteria
All pregnant women resident in the communities of the four LGAs, who attend ANC in the selected PHC facilities, who do not have chronic illness and give their consent to be part of the study were included in the study.

Exclusion Criteria
Pregnant women who are not resident in the study area, not registered for ANC and do not give their consent were excluded from the study. Also, excluded from the study are pregnant women who have chronic medical conditions known to negatively impact nutrition and nutritional status of individuals e.g., HIV/AIDS. Sickle cell disease, Diabetes, hepatitis B, hypertension, tuberculosis, smoking, alcoholism, depression, liver or kidney problems.

Instrument for Data Collection
A two researcher-self structured questionnaire titled "Dietary Practice Questionnaire" and "Nutritional Status of Pregnant Women Questionnaire" was used for the study. It consisted of five (3) parts: section A collected information on participants' demographic variables, section B relates with Dietary Practice, and section C nutritional status. Thus, it was structured in three parts to accommodate the above information. The dietary practices were assessed using 18 questions on dietary habits adapted from Nana and Zema (2018) and Diddana (2019) [7, 12], elicited response on eating frequency, food preference, food avoidance, fluid intake. A correct answer or answers in favour of healthy dietary practices attracted one mark while an incorrect answer or answers not favourable to healthy dietary practices attracted no mark (zero). The scores were summed and weighted in percentages, 60% was the cut off mark. Scores of 60% and above was considered good practice while less than 60% was considered poor practice as used by (Wei-Chuan *et al*., 2023).
The nutritional status of the participants was determined by anthropometric measurements of Mid Upper Arm Circumference (MUAC) and laboratory analysis of the participants haemoglobin levels (Hbl). For the MUAC, a 60 – Inch 150 cm flexible, non-stretchable measuring tape ruler that measures to the nearest 0.1cm as used. The measurement was taken on the left upper arm without clothing at the mid-point between the acromion and the olecranon process (that is, from the tip of the shoulder to the tip of the elbow) round the arm with the arm stretched. The participants were graded based on the MUAC score as follows: 25.75 – 28.10cm (Normal/Adequate), < 25.75 (underweight) - > 28.10cm (overweight) as inadequate nutritional status according to (Miele *et al*., 2021). For the laboratory analysis, bloodsamples of the participants were collected and carefully tested for haemoglobin levels (HbL). It was estimated using the WHO Haemoglobin cut off for determining Anaemia for pregnant women as cited by Ayensu *et al*. (2020) [6] where HbL<11g/dL is used for determining Anaemia classified as follows: 9.0-10.9g/dL- mild Anaemia, 7.0-8.9g/dL- moderate Anaemia and <7.0g/dL- severe Anaemia. A group can be said to be anaemic, when the prevalence is ≥40% for all types of anaemia or >2% for severe Anaemia. Also, urine samples were collected and Vitamin C estimation was done. 0.05 – 0.01g/L is the normal range.

Validation of Instrument
Validity is the extent to which the research instrument measures the variables it is designed to measure. The validity of the questionnaire was ensured in several ways:

Face/content validity: First, the instrument was presented to the research supervisors and two experts to determine the face content validity. After due appraisal and corrections, the added information was included in the questionnaire and due corrections made. The final correction was resubmitted to the supervisor who validated the research instrument.

Measuring Tape validity: The tape measure was compared with a plastic ruler which is a verified standard reference. It was also checked if the markings on the tape align very well to ensure consistency. Different persons measured MUAC of a respondent and the readings were compared. Also, the tape measure readings after measuring the MUAC was compared with the standard United Nation Children's Fund MUAC tape.

Haemoglobin measurement: This is validated by following the manufacturer's instruction. The same sample was tested more than once and the results were compared.

Reliability of the Instrument
The Cronbach's Alpha reliability method was used to test the consistency of the instrument to measure the variables purposed to be measured in this study. The reliability of the instrument was achieved by administration of the questionnaire to 40 pregnant women in PHC facility outside the ones to be used for the study. After two weeks, the same test was re-administered to the same participants. Reliability of the instrument was tested using Cronbach's Alpha technique to ensure internal consistency and construct validity of the instrument. The data collected was analysed using the SPSS version 27 software and the result is 0.86.

Procedure for Data Collection
The phases are as follows:
Phase 1: This involved collecting a letter of permission from the Primary Health Care Board to enable the researcher enter the Primary health care facilities.

Phase 2: Involved meeting and training of the research assistants.

Phase 3: Involved a meeting with the health care workers, trained research assistants and the researcher. The purpose, benefits and what is expected of them was explained and their cooperation throughout the period sought.

Phase 4: It was the recruitment of the study participants in the chosen health facilities. It took place in the ANC clinic. The health workers after offering the women ANC services then refers the participants to the researcher who explains the study and the procedure to the eligible participant, then written consent is obtained from the participants. For those who are not literate, an interpreter was used. This is done for all the participant

The questionnaire was then distributed to all pregnant women who consented to participate in the study via face-to-face. The researcher guaranteed the participants of the confidentiality of the information. A total of 400 questionnaire were administered to the respondents by the researcher and the six research assistants recruited for the study. After filling the questionnaire, they were retrieved from the participants and then checked for completeness each day. Out of the 400 questionnaires, only 368 of them were sufficiently completed and used in the analysis thus making the return rate 92%. After filling the questionnaire, the MUAC of the participant was measured.

In order to be effective, the researcher went with six assistants to help with the questionnaire administration, a licensed medical laboratory scientist and a nurse assisted in the medical testing and measurements respectively. The choice of medical laboratory scientist and nurse was to ensure professionalism in the process.

Method of Data Analysis

Data were coded and analysed using Statistical Package for social Sciences (SPSS) version 27 and summarized using frequency and percentage for the research questions. Chi-square analysis was employed to test hypotheses. One independent variable at a time was entered to check association with the dependent variable in bivariate analysis. At 95% confidence, variable with probability value (p-value) less than 0.05 was considered statistically significantly associated with dietary practice and nutritional status. The strength of association was described using Cramer's V or Phi coefficient of effect size.

Ethical Consideration

Ethical approval was collected from the Rivers State University Research, Development and Ethics Committee as well as Rivers State Hospitals' Management Board research, development and ethics committee (Ref. No – RSHMB/RSHREC/2023/050). Permission was also collected from the Rivers State Primary Health Care Board and the Medical officers/Coordinators in the four LGAs.

The individual was made to sign an informed consent and told that participation was voluntary and that at any point she wants to with draw, she is free, Confidentiality was also ensured. They were informed not to use their names and their questionnaires were assigned code numbers to ensure confidentiality. When the study was completed and the data have been analyzed, the response sheet will later be destroyed. They were also accorded their due respect."

Results

Research Questions One: What is the dietary practice of pregnant women in flood prone and non-flood prone communities in Rivers State?

Table 1a: Respondents' Level of Dietary Practices

	Non flood-prone		Flood-prone		**Total**	
Dietary Practice	N	%	N	%	Cases	%
Poor (< 60%)	147	75.8	129	74.1	276	75
Good (60% and above)	47	24.2	45	25.9	92	25
Total	194		174		368	100%

The table shows that the dietary practices of pregnant women in both flood-prone and non-flood-prone communities in Rivers State are generally poor. In non-flood-prone areas, 147(75.8%) of respondents scored below 60%, indicating poor dietary practices, while only 24.2% scored 60% or above, reflecting good practices. Similarly, in flood-prone areas, 129(74.1%) had poor dietary practices, and just 45(25.9%) achieved good dietary practices. Overall, three-quarters 276(75%) of all respondents exhibited poor dietary practices, while only 92(25%) demonstrated good practices. This highlights a significant prevalence of poor dietary habits among pregnant women across both communities.

Table 1b: Dietary Recall showing respondents' food diversity

Food Types	**Frequency (N=386)**	**Percent**
Grains, Tubers and starchy roots	314	85.3
Meats/Poultry/fish	276	75.0
Oils/Fats	265	72.0
Leafy/Dark green vegetables	232	63.0
Other Vegetables	196	53.3
Other Fruits	179	48.6
Pulses	174	47.3
Sweets & sweetened drinks	167	45.4
Vitamin A rich foods	131	35.6
Dairy (Milk and Milk products)	123	33.4
Nuts/seeds	118	32.1

The dietary recall data showed that pregnant women predominantly consume grains, tubers, and starchy roots 314(85.3%), followed by meats, poultry, and fish 276(75.0%), and oils and fats 265(72.0%). However, the intake of other vegetables 196(53.3%) and fruits 179(48.6%) is moderate, while the intake of nutrient-dense foods, such as vitamin A-rich foods 131(35.6%), dairy products 123(33.4%), and nuts/seeds 118(32.1%), is notably low. This imbalance indicates a diet heavily reliant on energy-dense foods but deficient in essential nutrients. These findings support the earlier result shown in Table 4.3a that dietary practices among pregnant women in both flood-prone and non-flood-prone communities are generally poor and lack essential nutrients critical for maternal and foetal health.

Research Questions Two: What is the nutritional status among pregnant women in flood prone and non-flood prone communities in Rivers State?

Table 2: Respondents' nutritional status using Malnutrition (MUAC)

	Non flood-prone		Flood-prone			
Nutritional Status (MUAC)	N	%	N	%	Total	%
Normal/Adequate (25.75-28.10cm)	105	54.1	82	47.1	187	**50.8**
Inadequate nutritional Status (<25.75cm &>28.1cm)	89	45.9	92	52.9	181	**49.2**
Total	194		174		368	

The table reveals that the half 187(50.8%) of the pregnant women in both flood-prone and non-flood-prone communities in Rivers State have a normal nutritional status based on Mid-Upper Arm Circumference (MUAC) while 181(49%) of them have Inadequate nutritional status. Specifically, 105(54%) of women in non-flood-prone areas and 82(47%) in flood-prone areas have normal nutritional status. However, 89(46%) in non-flood prone areas and 92(53%) in flood prone areas fell into the category of inadequate nutritional Status.

Table 2b: Respondents' nutritional status using Haemoglobin Levels (HBL)

HBL	**Frequency**	**Percent**
Normal (≥11g/dL)	71	19.3
Mild Anaemia (9-10.9g/dL)	201	54.6
Moderate Anaemia (7-8.9g/dL)	86	23.4
Severe Anaemia (<7.0g/dL)	10	2.7
Total	368	100
Vitamin C	Frequency	Percent
Abnormal	88	23.9
Normal (0.05-0.1g/L)	280	76.1
Total	368	100

The nutritional status of pregnant women in flood-prone and non-flood-prone communities in Rivers State, based on haemoglobin levels, reveals a high prevalence of anaemia. Only 71(19.3%) of respondents have normal haemoglobin levels (≥11 g/dL), indicating adequate nutritional status. The majority 201(54.6%) suffer from mild anaemia (9–10.9 g/dL), while 86(23.4%) have moderate anaemia (7–8.9 g/dL), and 10(2.7%) experience severe anaemia (<7.0 g/dL). These findings highlight that over 80% of the women are anaemic to varying degrees, reflecting poor nutritional status and a potential risk to maternal and fetal health. The data on vitamin C levels reveals that while 76.1% of pregnant women have normal levels (0.05–0.1 g/L), 23.9% exhibit abnormal levels. Although the majority of the respondents maintain adequate vitamin C levels, the notable percentage with deficiencies could contribute to the high prevalence of anaemia observed in the haemoglobin findings.

Table 2c: Participants' Haemoglobin Levels (HBL) in flood prone and non-flood prone communities

	Non flood-prone		Flood-prone		Total	
HBL	**N**	**%**	**N**	**%**	**Cases**	**%**
Anaemia (<11.0g/dL)	148	76.3	150	86.2	298	80.7
Normal (≥11g/dL)	46	23.7	24	13.8	70	19.3
Total	194		174		368	100

From the result in table 2c above it can be seen that 298(80.7%) of the participants are anaemic while 70(19.3%) were not. And the pregnant women in flood prone communities had higher prevalent of anaemia 150(86.2%) compared to 148(76.3%) for pregnant women in non-flood prone communities.

$H0_1$: There is no significant relationship between nutritional status and dietary practice of pregnant women in flood prone and non-flood prone communities in Rivers State.

Table 3: Relationship between Nutritional Status and Dietary Practice

	Dietary Practice									
HBL	Poor (<60%)		Good (≥60%)		Total		df	X^2	P-value	Cramer's V
Normal (≥11g/dL)	52	18.8%	19	20.7%	71	19.3%	2	1.74	0.42	0.07
Mild Anaemia (9-10.9g/dL)	156	56.5%	45	48.9%	201	54.6%				
Moderate to Severe Anaemia (≤ 8.9.g/dL)	68	24.6%	28	30.4%	96	26.1%				
Total	276		92		368	100%				

The table shows no significant relationship between nutritional status (haemoglobin levels) and dietary practices among pregnant women in flood-prone and non-flood-prone communities ($\chi^2 = 1.74$, $p = 0.42$, Cramer's V = 0.07). While poor dietary practices are common across all nutritional categories, they do not show a clear influence on haemoglobin levels. For instance, 156(56.5%) of women with mild anaemia and 68(24.6%) with moderate to severe anaemia had poor dietary practices, but similar trends were observed among those with good dietary practices.

Discussion

The poor dietary practice found in this result aligned with findings of previous studies as there are fewer studies who reported good dietary practice among majority of pregnant women. In Ethiopia, Wondmeneh (2022) [16] reported 73% of poor dietary practice while Alemayehu and Tesema (2015) [3] found 59.9% of poor dietary practice among pregnant women. Yalewdeg *et al*. (2020) [18] as well found 65% of poor dietary practice among his study participants. Hailu and Woldemichael (2019) [8] also reported inadequate dietary practice in 52.3% of pregnant women. Others who reported poor dietary habit among pregnant women includes Kanikwu *et al*. (2021), Diddana (2019) -54.8%, Berhane *et al*. (2022)- 71% and Nana and Zema (2018) [4, 7, 9, 12] who reported 60.7% of poor dietary practice. Most of the reported studies were conducted in developing and third world countries where family income cannot as it were guarantee good living standard and large family size is common as well. This could possibly explain the similarities in the findings. It was not surprising to the researcher that the dietary practice in the area was poor giving that the area is more rural than urban put together. And their feeding habits are influenced by availability and factors such as

culture and knowledge. From the dietary recall the pregnant women in the area of study consumed more of carbohydrate food than any other food group. Grains, starchy tubers and roots constitute staple foods in the area. Meanwhile, fruits, nuts and seed are not seen or valued as real food by most rural dwellers and this could be the reason for the trend as found in this study.

What was a bit surprising is that there was little or no difference in the dietary practice of both the women in the flood and non-flood prone communities. It is common to assume that people living in flood-prone areas would naturally suffer some level of food insecurity which will consequently affect their dietary practices. The implication is that both areas have access to certain food groups and share common practices in diet. Also, the poor dietary practice threatens maternal and child health since good dietary habits can influence mother's nutrition which should be at optimum during pregnancy. The habit of poor consumption of fruits, nut and seeds is unhealthy and may lead to deficiency in vital nutrients as these food groups are rich in vitamins and minerals and supplies essential micro nutrients to the body to function optimally especially in pregnancy. Furthermore, this poor dietary practice may be linked to poor antenatal care attendance by the pregnant women in the area leading to inadequate health education given to the pregnant women in antenatal care clinics. Perhaps, issues of nutrition, what to eat or not are not well understood. The pregnant women in the study areas should be encouraged to consume as much as possible fruits. From the discussion, it follows that the issue of poor dietary practice among pregnant women continues to persist and have become an issue calling for serious attention.

In line with this study findings are Rahman *et al*. (2013) [14] found 24.75% moderate malnourished and 66.25% malnourished. Also, Dausayi *et al*. (2019), and Palupi *et al*. (2019) [5, 13] found high malnutrition among majority of pregnant women in their studies. In contrast to this study findings are the findings of Dhanashree *et al.* (2020) [6] who found 72.5% normal MUAC (i.e., 27.5% low MUAC), Venkataraman *et al*. (2022) [15] found 59.3% normal MUAC, Diddana (2019) [7]- 81% well-nourished and 19% malnourishment, and Lama *et al*. (2018) [11]- 24% acute malnutrition and greater majority having good nutritional status. Also, in Nigeria, Adeogun and Adeoti (2019) [1] found that 67% of their study population were not malnourished, and Akpotu and Diorgu (2021) [2] as well found 27.8% of pregnant women to be malnourished with MUAC of less than 23cm while as much 72.2% were adequately nourished with MUAC of 23 and above. The difference in the findings could be as a result of the slight variations in cut off mark chosen by individuals on MUAC.

In this study however, there were more pregnant women from flood prone community who had inadequate nutritional status unlike their counterpart from non-flood prone community who had more persons with adequate nutritional status. This result is an indication that pregnant women from flood prone areas are more likely to suffer malnutrition than those from non-flood prone areas. The reason for this is not far-fetched. Flood is a major cause of lack of food, and where this is so and prevalent, the nutrition of the people in such areas are affected. Furthermore, the HBL test finding is not just an indicator of inadequate nutritional status among the pregnant women but also an indicator that they are anaemic going by the position of the World Health Organization which stipulated that a group can be said to be anaemic, when the prevalence is ≥40% for all types of anaemia or >2% for severe anaemia (Ayensu *et al*., 2020).

This study result corroborates the findings of past scholars. Rahman *et al*. (2013) [14] found more than 65% of subjects who were anaemic of which 20% had severe and 39.5% had mild anaemia and only 34.5% had normal HBL. Dhanashree *et al*. (2020) [6] found high prevalence of anaemia with 53.4% mild, 23.3% moderate and 2.9% severe anaemia. Adeogun and Adeoti (2019) [1] found a high level of anaemia among pregnant women in Nigeria. They stated that of about 90% with anaemia, 11.8% had severe anaemia, 48.8% mild anaemia and 31.8% anaemia. Again, the percentage difference for HBL between pregnant women in flood prone and non-flood prone like the MUAC suggest that pregnant women in flood prone communities have a higher chance of becoming anaemic.

It is normal to think that with the high prevalence of pregnant women with anaemia would reflect as much in poor nutritional status as measured by MUAC. But this was not so. The wide discrepancy on the result of the MUAC and HBL is suggestive of the fact that, the average normal nutrition level found using MUAC may have been affected by the natural fat arms of women from Southern Nigeria. Also, the natural weight gain by pregnant women could be another reason for this result. Being fat does not automatically make one nutritionally healthy. The consumption of more energy food can lead to fat accumulation around the arm, thigh and abdomen. More so, the high level of anaemia may have been occasioned by their poor dietary practice especially low intake of food rich in iron and vitamins A and some gynaecological or obstetric conditions for pregnant women like haemodilution where there is an increase in the blood volume leading to reduced blood cell concentration or parasitaemia. It follows therefore, that laboratory testing like HBL is a better test for nutritional status and should be utilised by physicians and healthcare providers to check nutritional status especially among pregnant women. More so, the over 80% of anaemia among the pregnant women to varying degrees reflecting poor nutritional status is a potential risk to maternal and foetal health.

Conclusion

The study revealed that the dietary practices of pregnant women were generally poor across both flood-prone and non-flood-prone communities. A large proportion of the respondents consumed mostly starchy foods such as grains, tubers, and roots, with limited intake of fruits, vegetables, dairy products, and other nutrient-rich foods. This pattern suggests a diet that provides energy but lacks essential vitamins and minerals needed for healthy pregnancy outcomes. The findings further showed that while half of the women had a normal nutritional status based on Mid-Upper Arm Circumference, nearly the same proportion were found to be nutritionally inadequate, indicating widespread nutritional imbalance among pregnant women. The results on haemoglobin levels revealed a high rate of anaemia, with more than four out of every five pregnant women affected to varying degrees. The condition was more common among women in flood-prone communities. Although most of the participants maintained normal vitamin C levels, the presence of deficiencies among some respondents may have contributed to the high anaemia rates recorded. The findings

showed that there was no significant relationship between dietary practices and haemoglobin levels. This suggests that while many pregnant women exhibited poor dietary habits, other factors such as infection, environmental stress, and healthcare access might have contributed to their poor nutritional outcomes. The study indicates that pregnant women's diets are inadequate in quality and diversity, which has implications for both maternal and child health. Improving nutrition education, promoting balanced diets, and strengthening healthcare support systems may help address the nutritional gaps observed among pregnant women and reduce the risk of anaemia and related health challenges.

Recommendations

Based on the findings of the study, it was recommended that:

1. Health authorities and community health workers should increase nutrition education for pregnant women, focusing on the importance of balanced diets that include fruits, vegetables, proteins, and dairy products to improve overall nutritional status.
2. Regular screening for anaemia and other nutrition-related conditions should be carried out during antenatal visits, with appropriate supplements and guidance provided to ensure better maternal health and pregnancy outcomes.

References

1. Adeogun A, Adeoti C. Assessment of nutritional status of pregnant women attending antenatal care centers in Odo-Otin Local Government Area of Osun State, Nigeria. Pan African Journal of Life Sciences,2019:3:115-122. DOI: 10.36108/pajols/9102/30(0110)116
2. Akpotu E, Diorgu F. Nutrition status of pregnant women in selected internally displaced persons camp in Delta State, Nigeria. International Journal of Pregnancy and Child Birth,2021:7:30-34. DOI: 10.15406/ipcb.2021.07.00223
3. Alemayehu MS, Tesema EM. Dietary Practice and Associated Factors among Pregnant Women in Gondar Town North West, Ethiopia. International Journal of Nutrition and Food Sciences,2015:4:707-712. DOI: 10.11648/j.ijnfs.20150406.27
4. Berhane A, Fikadu T, Belachew T. Dietary practice among cohort pregnant women who gave birth to neonates with and without neural tube defect: a comparative cross-sectional study. Journal of Nutritional Science, 2022, 11.
5. Dausayi SD, Yunusa UM, Yunusa I. Nutritional status of pregnant women attending antenatal care services in Primary Health Care Management Board Kano State, Nigeria. Nigerian Journal of Nutritional Sciences,2019:40:79-86.
6. Dhanashree RK, Ashwini N, Mubashir A. Assessment of Nutritional Status in Pregnant Women. International Journal of Health Sciences and Research,2020:10:77-81.
7. Diddana TZ. Factors associated with dietary practice and nutritional status of pregnant women in Dessie town, northeastern Ethiopia. BMC Pregnancy and Childbirth,2019:19:517. https://doi.org/10.1186/s12884-019-2649-0
8. Hailu S, Woldemichael B. Dietary diversity and associated factors among pregnant women attending antenatal care at public health facilities in Bale Zone, Southeast Ethiopia. Nutrition and Dietary Supplements,2019:11:1–8. DOI: 10.2147/NDS.S179265
9. Kanikwu PN, Jimmy JA, Emesowum AC. Nutrition in pregnancy and pregnancy outcome in two primary health centres, Okpanam. Journal of Nursing and Social Sciences Related to Health and Illness,2021:23:25–32. DOI: 10.32725/kont.2021.004
10. Kuche D. Factors associated with dietary practices and nutritional status among pregnant women in Wondo Genet district, 2014.
11. Lama N, Lamichhane R, Shreejana KC, Bhandari GP, Wagle RR. Determinants of nutritional status of pregnant women attending antenatal care in Western Regional Hospital, Nepal. International Journal of Community and Medicine and Public Health,2018:5:5045-5051. DOI: 10.18203/2394-6040.ijcmph20184776
12. Nana A, Zema T. Dietary practices and associated factors during pregnancy in northwestern Ethiopia. BMC Pregnancy and Childbirth,2018:18:183.
13. Palupi IK, Susetyowati RM, Faza F. Feeding practices and nutritional status among children under five years of age in Sleman district, Yogyakarta, Indonesia. Pakistan Journal of Nutrition,2019:18:888-894. DOI: 10.3923/pjn.2019.888.894
14. Rahman H, Islam M, Karim R, Ud-Daula A, Hossain I, Hossain S, *et al*. A study on nutritional status of pregnant woman in South-West region of Bangladesh. International Research Journal of Pharmaceutical and Applied Sciences,2013:3:54-58.
15. Venkataraman IR, Manisha HM, Sonakshi M, Manuel GG, Puneeth GK, Harsha C. Study on Assessment of Nutritional Status of Pregnant Women Leading to Malnutrition. International Journal of Pharmaceutical Sciences Review and Research,2022:14:79-85. DOI: 10.47583/ijpsrr.2022.v75i01.014
16. Wondmeneh TG. Dietary diversity practice and its influencing factors among pregnant women in Afar region of Ethiopia: mixed method study. BMC Pregnancy and Childbirth,2022:22:291. https://doi.org/10.1186/s12884-022-04641-y
17. World Health Organization. Nutrition and food safety. WHO, 2024. https://www.who.int/teams/nutrition-and-food-safety/global-targets-2025
18. Yalewdeg M, Birhane M, Adissu Y. Dietary practices and their determinants among pregnant women in Gedeo zone, southern Ethiopia: a community-based cross-sectional study. Nutrition and Dietary Supplements,2020:12:267.
19. Zerfu TA, Umeta M, Baye K. Dietary habits, food taboos, and perceptions towards weight gain during pregnancy in Arsi, rural central Ethiopia: a qualitative cross-sectional study. Journal of Health, Population and Nutrition,2016:35:22. DOI: 10.1186/s41043-016-0059-8
20. Zhang C, Chu H, Pei YV, Zhang J. Laboratory effects of COVID-19 infection in pregnant women and their newborns: a systematic review and meta-analysis. Frontiers in Global Women's Health,2021:2:647072