



Journal of Frontiers in Multidisciplinary Research

Assessment of Awareness, Adherence and Perception of Nutritional Intervention Programmes among Pregnant Women in Gassol Local Government Area, Taraba State, Nigeria.

Muhammad Sanusi Ahmad^{1*}, Philemon Babylon¹, Abubakar Salim Aliyu² and Habila Ahmed Muazu³

¹Department of Public Health Science, Faculty of Health Science, Taraba State University, Jalingo, Nigeria

²Department of Hospital Services, Taraba State Ministry of Health, Jalingo, Nigeria

³Federal College of Education, Yola, Adamawa State, Nigeria

Abstract

Keywords	Abstract
Maternal nutrition; Nutritional intervention; Pregnancy; Maternal health; Nutrition awareness; Antenatal care	<i>Maternal nutrition is a key determinant of pregnancy outcomes and neonatal survival. Although nutritional intervention programmes have been implemented in Nigeria to improve maternal health, malnutrition remains a major public health challenge, particularly in rural communities. This study assessed the awareness, adherence, and perception of nutritional intervention programmes among pregnant women attending antenatal clinics in Gassol Local Government Area, Taraba State, Nigeria. A descriptive cross-sectional survey design was employed among pregnant women attending selected primary healthcare facilities. Data were collected using a structured, validated questionnaire covering socio-demographic characteristics, awareness of nutritional guidelines, adherence to recommended nutritional practices, perceived programme effectiveness, implementation challenges, and improvement strategies. Data were analysed using SPSS version 25. Descriptive statistics (frequencies, percentages, means, and standard deviations) summarized the data, while Chi-square analysis tested associations at a significance level of $p \leq 0.05$. The findings revealed moderate to high awareness of nutritional guidelines among most respondents, with regular adherence to recommended practices such as iron and folic acid supplementation, dietary diversification, and attendance at nutrition counselling sessions. Participants perceived the programmes as beneficial in improving maternal health, preventing anaemia, promoting fetal growth, and reducing pregnancy-related complications. However, programme effectiveness was constrained by poverty, food insecurity, inadequate nutrition knowledge, irregular supplement supply, cultural dietary practices, transportation difficulties, and limited healthcare resources. The study concludes that nutritional intervention programmes have positively influenced maternal nutrition in Gassol LGA, but their effectiveness can be enhanced through strengthened nutrition education, improved programme coverage, consistent supplement availability, and interventions addressing socioeconomic barriers.</i>

1. Introduction

Maternal nutrition is a critical determinant of maternal and fetal health throughout pregnancy. Adequate nutrition supports normal fetal growth, reduces the risk of pregnancy complications such as low birth weight, preterm birth, and maternal anaemia, and contributes to improved neonatal survival. Conversely, poor maternal nutrition increases the likelihood of adverse pregnancy outcomes and has lasting effects on child growth and development. Consequently, improving maternal nutrition remains a global public health priority (World Health Organization [WHO], 2023).

* Corresponding Author: Muhammad Sanusi Ahmad

Email Address: abunajjma@gmail.com

Pregnancy increases the body's nutritional requirements, making adequate intake of energy, protein, and essential micronutrients such as iron, folic acid, calcium, iodine, and vitamin D necessary for healthy pregnancy outcomes. Deficiencies in these nutrients have been associated with maternal morbidity, impaired fetal development, and increased risks of neonatal complications. Ensuring dietary diversity and appropriate supplementation is therefore essential during pregnancy (Keats et al., 2021).

To address maternal malnutrition, governments and international organizations have implemented various nutritional intervention programmes, including iron and folic acid supplementation, nutrition education, dietary counselling, food fortification, and balanced energy-protein supplementation. These interventions are commonly integrated into routine antenatal care services to improve maternal nutritional status and pregnancy outcomes (UNICEF, 2023).

Despite these interventions, maternal malnutrition remains a major challenge in many developing countries, including Nigeria. Poverty, food insecurity, inadequate nutrition knowledge, poor dietary practices, and limited access to quality antenatal services continue to affect the nutritional status of pregnant women, particularly in rural communities where health services are often inadequate (Federal Ministry of Health, 2022).

In Gassol Local Government Area of Taraba State, pregnant women face several challenges that may limit the effectiveness of nutritional intervention programmes. These include irregular availability of nutritional supplements, transportation barriers, socioeconomic constraints, and cultural beliefs that influence dietary practices during pregnancy. Such factors may reduce adherence to recommended nutritional guidelines despite the availability of intervention programmes (Food and Agriculture Organization, 2022).

The effectiveness of nutritional intervention programmes depends not only on their availability but also on the awareness, adherence, and perceptions of beneficiaries. Pregnant women who understand the benefits of proper nutrition and consistently follow recommended practices are more likely to experience positive pregnancy outcomes. Assessing these factors is therefore important for strengthening maternal nutrition programmes and improving service delivery (World Health Organization, 2023).

Although several studies have examined maternal nutrition in Nigeria, limited evidence exists on the awareness, adherence, and perception of nutritional intervention programmes among pregnant women in Gassol Local Government Area of Taraba State. This study was therefore conducted to assess these factors in order to provide evidence that can guide policymakers and healthcare providers in improving maternal nutrition interventions within the study area (National Population Commission & ICF, 2019).

2. Materials and Methods

2.1 Study Area

This study was carried out in Gassol Local Government Area (LGA) of Taraba State, North-Eastern Nigeria. Gassol LGA was selected because of the implementation of maternal nutrition intervention programmes through primary healthcare facilities and the persistent nutritional challenges experienced among pregnant women despite these interventions.

Gassol LGA has its administrative headquarters at Mutum-Biyu and lies approximately between latitude 8°30' N and 9°15' N and longitude 10°30' E and 11°15' E. The Local Government Area shares boundaries with Ardo-Kola and Jalingo LGAs to the north, Bali LGA to the west, Ibbi LGA to the south, and Lau LGA to the east.

The area is predominantly rural, with farming, fishing, livestock production, and petty trading serving as the major occupations of residents. The population comprises Fulani, Jukun, Hausa, Mumuye, Tiv, and other ethnic groups whose cultural practices influence maternal nutrition and health-seeking behaviours. Healthcare services are provided through primary healthcare centres, private clinics, and referral hospitals where antenatal care services include nutrition education, iron and folic acid supplementation, maternal nutrition counselling, malaria prevention, and routine maternal health services.

2.2 Research Design

This research employed a descriptive cross-sectional survey design. The design enabled the collection of information from pregnant women attending antenatal clinics at a single point in time. This approach allowed the researcher to assess respondents' awareness, adherence, and perceptions of nutritional intervention programmes and identify factors affecting programme implementation within the study area.

2.3 Study Population

The study population consisted of pregnant women attending antenatal clinics in selected primary healthcare facilities in Gassol Local Government Area during the study period. Eligible participants included pregnant women who had attended at least one antenatal clinic visit and voluntarily consented to participate in the

study. Women who were critically ill or unable to provide reliable responses during data collection were excluded from the study.

2.4 Instrument for Data Collection

Data were collected using a structured interviewer-administered questionnaire and a Key Informant Interview (KII) guide. The questionnaire was developed by the researcher after reviewing relevant literature on maternal nutrition and nutritional intervention programmes and was validated by experts in Public Health and Research Methodology. It consisted of sections covering respondents' socio-demographic characteristics, awareness of nutritional guidelines, adherence to recommended nutritional practices, and perceptions of nutritional intervention programmes.

A Key Informant Interview (KII) guide was used to obtain qualitative information from selected healthcare professionals involved in the implementation of maternal nutrition programmes, including antenatal care providers, nutrition focal persons, and primary healthcare managers. The KII explored implementation challenges of nutritional intervention programmes and strategies for improving programme effectiveness.

2.5 Data Analysis

The data obtained from the questionnaires were coded and entered into the Statistical Package for the Social Sciences (SPSS) version 25 for analysis. Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize respondents' socio-demographic characteristics and study variables. Cross-tabulation was used to compare awareness and adherence across selected demographic variables, while Pearson Chi-square was used to determine the association between respondents' awareness, adherence, and perceptions of nutritional intervention programmes. Logistic regression analysis was performed to identify predictors of adherence where appropriate. All analyses were conducted at $p \leq 0.05$ level of statistical significance.

2.6 Ethical Consideration

Ethical approval for this study was obtained from the appropriate Health Research Ethics Committee before commencement of data collection. Administrative permission was obtained from the Gassol Local Government Health Authority and the management of the selected healthcare facilities. Written informed consent was obtained from all participants before enrolment into the study. Participation was voluntary, confidentiality was maintained throughout the study, and respondents were informed of their right to withdraw from the study at any time without any consequences.

3. Results

3.1 Socio-demographic Characteristics of Respondents

A total of 399 pregnant women participated in the study, giving a response rate of 100%. Table 1 presents the socio-demographic characteristics of the respondents. Most respondents were aged 25–34 years (43.6%), followed by those aged 15–24 years (31.8%), while 24.6% were aged 35 years and above. Most respondents were married (86.2%), whereas 8.5% were single and 5.3% were divorced or widowed. Regarding educational attainment, 34.8% had secondary education, 29.6% had tertiary education, 23.3% had primary education, while 12.3% had no formal education. Most respondents were self-employed (38.6%), followed by housewives (31.1%), civil servants (20.3%), and students (10.0%). In terms of parity, 41.4% had one to two previous pregnancies, 35.6% had three to four pregnancies, and 23.0% had five or more pregnancies.

Table 1: Socio-demographic Characteristics of Respondents (N = 399)

Variable	Frequency	Percentage (%)
Age (years)		
15–24	127	31.8
25–34	174	43.6
≥35	98	24.6
Total	399	100.0
Marital Status		
Married	344	86.2
Single	34	8.5
Divorced/Widowed	21	5.3
Total	399	100.0
Educational Level		
No Formal Education	49	12.3
Primary	93	23.3
Secondary	139	34.8
Tertiary	118	29.6
Total	399	100.0
Occupation		
Housewife	124	31.1
Civil Servant	81	20.3
Self-employed	154	38.6
Student	40	10.0
Total	399	100.0
Parity		
1–2	165	41.4
3–4	142	35.6
≥5	92	23.0
Total	399	100.0

3.2 Awareness of Nutritional Guidelines among Pregnant Women

Table 2 shows respondents' awareness of recommended nutritional guidelines during pregnancy. Most respondents indicated that they were aware of nutritional guidelines (Mean = 4.18 ± 0.81). High awareness was also observed regarding the importance of consuming balanced diets (4.34 ± 0.69), taking iron and folic acid supplements (4.41 ± 0.66), receiving nutrition education during antenatal care (4.09 ± 0.88), eating fruits and vegetables daily (4.15 ± 0.83), and maintaining adequate water intake during pregnancy (4.36 ± 0.72). The overall grand mean of 4.25 indicates a high level of awareness among pregnant women attending antenatal clinics in Gassol Local Government Area.

Table 2: Awareness of Nutritional Guidelines (N = 399)

Statement	Mean	SD	Decision
Aware of nutritional guidelines	4.18	0.81	High
Balanced diet is important	4.34	0.69	High
Importance of iron and folic acid	4.41	0.66	High
Receive nutrition education during ANC	4.09	0.88	High
Importance of fruits and vegetables	4.15	0.83	High
Importance of adequate water intake	4.36	0.72	High
Grand Mean	4.25		High Awareness

3.3 Adherence to Nutritional Guidelines

Table 3 presents respondents' adherence to recommended nutritional practices. Most respondents reported regularly taking prescribed iron and folic acid tablets (4.11 ± 0.89), consuming balanced meals (4.05 ± 0.91), attending scheduled antenatal clinics (4.29 ± 0.73), avoiding alcohol consumption (4.52 ± 0.61), avoiding cigarette smoking (4.67 ± 0.55), and consuming fruits and vegetables frequently (3.98 ± 0.94). The overall grand mean of 4.27 indicates a high level of adherence to nutritional recommendations among the respondents.

Table 3: Adherence to Nutritional Guidelines

Statement	Mean	SD	Decision
Take iron and folic acid supplements	4.11	0.89	High
Eat balanced meals daily	4.05	0.91	High
Attend scheduled ANC visits	4.29	0.73	High
Consume fruits and vegetables	3.98	0.94	High
Avoid alcohol	4.52	0.61	Very High
Avoid smoking	4.67	0.55	Very High
Grand Mean	4.27		High Adherence

3.4 Perceived Impact of Nutritional Intervention Programmes

Table 4 presents respondents' perceptions regarding the effectiveness of nutritional intervention programmes. Most respondents agreed that the programmes improve maternal health (4.36 ± 0.68), reduce maternal anaemia (4.24 ± 0.77), improve fetal growth (4.31 ± 0.71), reduce pregnancy complications (4.12 ± 0.81), and improve birth outcomes (4.20 ± 0.79). The grand mean of 4.25 indicates an overall positive perception of the effectiveness of nutritional intervention programmes.

Table 4: Perceived Impact of Nutritional Intervention Programmes

Statement	Mean	SD	Decision
Improve maternal health	4.36	0.68	Agree
Reduce maternal anaemia	4.24	0.77	Agree
Improve fetal growth	4.31	0.71	Agree
Reduce pregnancy complications	4.12	0.81	Agree
Improve birth outcomes	4.20	0.79	Agree
Grand Mean	4.25		Positive Perception

3.5 Challenges Affecting Nutritional Intervention Programmes

Table 5 presents respondents' perceptions of the challenges affecting nutritional intervention programmes. The high cost of nutritious foods (86.2%) was the most frequently reported challenge, followed by poverty (82.7%), irregular supply of nutritional supplements (74.9%), food insecurity (71.4%), cultural food restrictions (64.9%), and long distance to health facilities (59.6%). These findings indicate that economic and health system factors remain major barriers to effective implementation of nutritional intervention programmes.

Table 5: Challenges Affecting Programme Implementation (N = 399)

Challenge	Yes n (%)	No n (%)
High cost of nutritious foods	344 (86.2)	55 (13.8)
Poverty	330 (82.7)	69 (17.3)
Irregular supplement supply	299 (74.9)	100 (25.1)
Food insecurity	285 (71.4)	114 (28.6)
Cultural food restrictions	259 (64.9)	140 (35.1)
Long distance to health facility	238 (59.6)	161 (40.4)

3.6 Suggestions for Improving Nutritional Intervention Programmes

Table 6 shows respondents' suggestions for improving nutritional intervention programmes. The majority recommended strengthening nutrition education during antenatal care (91.2%), followed by improving the availability of nutritional supplements (89.5%), increasing government support for vulnerable pregnant women (88.7%), reducing the cost of nutritious foods (86.7%), and strengthening community awareness campaigns (84.5%). These findings suggest strong support for interventions that improve programme accessibility and sustainability.

Table 6: Suggested Improvement Strategies

Recommendation	Frequency	Percentage (%)
Strengthen nutrition education	364	91.2
Improve supplement availability	357	89.5
Government nutritional support	354	88.7
Reduce food costs	346	86.7
Community awareness campaigns	337	84.5

4. Discussion

This study assessed the awareness, adherence, and perceptions of nutritional intervention programmes among pregnant women attending antenatal clinics in Gassol Local Government Area of Taraba State, Nigeria. The findings indicate that respondents had a high level of awareness of recommended nutritional guidelines during pregnancy, demonstrated good adherence to recommended nutritional practices, and generally perceived existing nutritional intervention programmes as effective in improving maternal and fetal health. However, the study also identified several socioeconomic and health system barriers that continue to limit programme effectiveness, including poverty, the high cost of nutritious foods, food insecurity, irregular availability of nutritional supplements, cultural dietary restrictions, and poor access to healthcare services.

The high level of awareness observed among respondents suggests that nutrition education delivered during antenatal care has been effective in improving knowledge of appropriate dietary practices during pregnancy. Most respondents were aware of the importance of balanced diets, iron and folic acid supplementation, adequate fruit and vegetable consumption, sufficient water intake, and regular attendance at nutrition counselling sessions. This finding is consistent with the study by Alemu et al. (2022), who reported high nutritional knowledge among pregnant women receiving routine antenatal nutrition education in Ethiopia. Similarly, the World Health Organization (2023) emphasized that integrating nutrition counselling into antenatal care remains one of the most effective approaches for improving maternal nutritional knowledge and promoting healthy pregnancy outcomes. The high awareness reported in this study may reflect improvements in antenatal care utilization and the commitment of healthcare workers to providing maternal nutrition education. Nevertheless, awareness alone may not guarantee behavioural change where economic and food access challenges persist.

The study further demonstrated a high level of adherence to recommended nutritional guidelines. Respondents reported regular intake of iron and folic acid supplements, consistent attendance at antenatal clinics, frequent consumption of balanced diets, increased intake of fruits and vegetables, and avoidance of alcohol and tobacco during pregnancy. These findings support those of Nguyen et al. (2022), who found that regular antenatal attendance significantly improved adherence to recommended maternal nutritional practices. Likewise, Bhutta et al. (2023) reported that integrated maternal nutrition interventions combining nutrition counselling with micronutrient supplementation substantially improve compliance with recommended dietary practices during pregnancy. Despite this encouraging level of adherence, some respondents indicated that financial hardship and irregular availability of supplements affected their ability to consistently maintain healthy dietary practices, suggesting that adherence is influenced by both knowledge and socioeconomic conditions.

Respondents also expressed positive perceptions regarding the effectiveness of nutritional intervention programmes. Most agreed that the programmes improve maternal health, reduce anaemia, promote fetal growth, decrease pregnancy-related complications, and improve birth outcomes. These findings are consistent with the World Health Organization (2023), which reported that maternal nutrition interventions, including iron-folic acid supplementation and nutrition counselling, significantly reduce maternal anaemia, low birth weight, preterm birth, and neonatal mortality. Similarly, Black et al. (2021) concluded that comprehensive maternal nutrition programmes produce significant improvements in maternal nutritional status and neonatal survival, particularly in low-resource settings. The favourable perceptions observed among respondents may be attributed to the health benefits experienced during antenatal care, including improved maternal wellbeing and pregnancy progression.

Despite these positive findings, respondents identified several important challenges affecting the implementation of nutritional intervention programmes. The most commonly reported barriers included poverty, high food costs, food insecurity, irregular supply of nutritional supplements, cultural food taboos, and long distances to healthcare facilities. These findings agree with the Global Nutrition Report (2024), which identified poverty and household food insecurity as major obstacles to achieving optimal maternal nutrition across low- and middle-income countries. Similarly, FAO (2023) reported that increasing food prices have negatively affected dietary diversity among pregnant women, while Ahmed et al. (2022) found that financial constraints and poor access to healthcare services significantly limited compliance with

maternal nutrition interventions in northern Nigeria. These findings suggest that although awareness and adherence are relatively high, structural socioeconomic barriers continue to undermine programme effectiveness.

Respondents also proposed several strategies for improving maternal nutrition programmes. The most highly recommended interventions included strengthening nutrition education during antenatal care, ensuring uninterrupted availability of nutritional supplements, increasing government support for vulnerable pregnant women, reducing the cost of nutritious foods, and expanding community nutrition awareness campaigns. These recommendations are consistent with the World Health Organization (2023), which advocates continuous nutrition counselling alongside reliable micronutrient supplementation throughout pregnancy. Similarly, UNICEF (2023) recommends strengthening community-based nutrition education, improving supply chain management, and expanding social support programmes to improve maternal nutritional outcomes. The findings further support the recommendation by Bhutta et al. (2023) that successful maternal nutrition programmes require coordinated efforts involving the health, agriculture, education, and social protection sectors.

Overall, the findings of this study have important implications for maternal and child health programming in Nigeria. Although pregnant women attending antenatal clinics in Gassol Local Government Area demonstrated high awareness, good adherence, and positive perceptions of nutritional intervention programmes, socioeconomic inequalities remain major barriers to achieving optimal maternal nutrition. These findings suggest that nutrition education alone is insufficient without complementary interventions that address poverty, food insecurity, healthcare accessibility, and consistent availability of nutritional supplements. Strengthening antenatal nutrition counselling, improving supply chain systems, expanding community-based nutrition education, and implementing nutrition-sensitive social protection programmes will enhance the effectiveness of maternal nutrition interventions and contribute to improved maternal and neonatal health outcomes in Gassol Local Government Area and similar settings.

5. Conclusion

This study assessed the awareness, adherence, and perceptions of nutritional intervention programmes among pregnant women attending antenatal clinics in Gassol Local Government Area of Taraba State, Nigeria. The findings revealed that respondents generally had a high level of awareness of recommended nutritional practices and demonstrated good adherence to nutritional guidelines, including regular antenatal attendance, iron and folic acid supplementation, and healthier dietary practices. Participants also perceived nutritional intervention programmes as effective in improving maternal health, reducing anaemia, promoting fetal growth, and enhancing pregnancy outcomes. Despite these positive findings, the effectiveness of the programmes continues to be constrained by poverty, food insecurity, the high cost of nutritious foods, irregular availability of nutritional supplements, cultural dietary restrictions, and limited access to healthcare services. The study therefore concludes that while maternal nutrition intervention programmes have made significant contributions to improving maternal nutrition in Gassol Local Government Area, addressing the underlying socioeconomic and health system challenges is essential to maximize programme effectiveness and achieve better maternal and neonatal health outcomes.

6. Recommendations

Based on the findings of this study, the following recommendations are made:

1. Strengthen nutrition education during antenatal care. Healthcare providers should provide consistent, culturally appropriate nutrition counselling during every antenatal visit to improve pregnant women's knowledge and adherence to recommended dietary practices.
2. Ensure continuous availability of nutritional supplements. Government and relevant stakeholders should strengthen the supply chain to guarantee uninterrupted access to iron, folic acid, calcium, and other essential micronutrient supplements in all primary healthcare facilities.
3. Improve access to nutritious foods for vulnerable pregnant women. Nutrition-sensitive social protection programmes, including food assistance, livelihood support, and agricultural interventions, should be expanded to reduce food insecurity and improve maternal nutrition.
4. Strengthen community awareness and healthcare capacity. Community-based nutrition education should be intensified while providing regular training for healthcare workers to enhance effective nutrition counselling, behaviour change communication, and monitoring of maternal nutrition programmes.

7. Study Limitations

Although the study provides valuable evidence regarding nutritional intervention programmes among pregnant women in Gassol Local Government Area, several limitations should be acknowledged.

First, the cross-sectional design limits the ability to establish causal relationships between awareness, adherence, and maternal health outcomes. Longitudinal studies would provide stronger evidence regarding the long-term effectiveness of nutritional interventions.

Second, information obtained from respondents was based on self-report and may have been influenced by recall bias or social desirability bias, particularly regarding adherence to nutritional recommendations.

Third, the study was conducted among pregnant women attending antenatal clinics in selected primary healthcare facilities. Consequently, the findings may not adequately represent pregnant women who do not utilize antenatal care services or those receiving care in private health facilities.

Despite these limitations, the study provides important baseline information that can guide policy formulation, programme improvement, and future maternal nutrition research in Taraba State and similar settings.

Acknowledgements

The authors sincerely appreciate all pregnant women who voluntarily participated in this study. Gratitude is also extended to the management and staff of the selected primary healthcare facilities in Gassol Local Government Area for granting permission and providing support during data collection. The contributions of the research assistants and experts who reviewed the study instrument are also gratefully acknowledged.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this manuscript.

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