ISRG JOURNAL OF CLINICAL MEDICINE AND MEDICAL RESEARCH [ISRGJCMMR]

ISRG PUBLISHERS
Abbreviated Key Title: ISRG J Clinic.Medici.Medica.Res.
ISSN: 3048-8850 (Online)
Journal homepage: https://isrgpublishers.com/cmmr/
Volume – III, Issue - IV (July – August) 2026
Frequency: Bimonthly

ASSESSMENT OF NUTRITIONAL KNOWLEDGE AND PRACTICE ON THE HEALTH OF PREGNANT WOMEN IN MGBUNDUKWU HEALTH CENTER, RIVERS STATE

Udo Orukwowu

Department of Nursing Sciences, Faculty of Basic Medical Sciences, College of Medical Sciences, Rivers State University, Port Harcourt, Nigeria

| **Received:** 08.07.2026 | **Accepted:** 13.07.2026 | **Published:** 14.07.2026

***Corresponding author:** Udo Orukwowu

Abstract

The nutritional status of pregnant women can have a major influence on the health of the fetus, infant, and mother. Deficiencies in micronutrients such as calcium, iron, vitamin A, and iodine can lead to health problems in the mother and pregnancy complications that can endanger both mother and child. Low maternal weight gain during pregnancy, due to inadequate nutrition, increases the risk of preterm delivery, low birth weight, and congenital anomalies. Maternal undernutrition is a major problem, particularly in developing countries, where it also contributes to maternal mortality. This study assesses the nutritional knowledge and practice on the health of pregnant women in Mgbundukwu Health Center, Rivers State. A descriptive cross-sectional research design was employed with a population of 412. A self-structured questionnaire was used to collect data and the responses were analysed using simple percentages presented in frequencies and tables. The results revealed that out of 412 respondents, 4.2% have high level of nutritional knowledge, 4.2% adopt healthy nutritional practice and 3.7% agree that there are factors that hinder nutritional practice. This study recommends enhanced educational practice on nutrition, community-based support programs to address barriers such as cultural beliefs, cravings, and food cost that can hinder nutritional practice on the health of pregnant women in Mgbundukwu Health Center, Rivers State.

Keywords: Assessment, knowledge, practice, pregnant women, nutrition.

Introduction

The nutritional status of pregnant women can have a major influence on the health of the fetus, infant, and mother (Katenga-Kaunda et al., 2021). Deficiencies in micronutrients such as calcium, iron, vitamin A, and iodine can lead to health problems in the mother and pregnancy complications that can endanger both mother and child. Low maternal weight gain during pregnancy, due

DOI: 10.5281/zenodo.21351685

to inadequate nutrition, increases the risk of preterm delivery, low birth weight, and congenital anomalies (Koumagbeafide, 2019). Maternal undernutrition is a major problem, particularly in developing countries, where it also contributes to maternal mortality (World Health Organization, 2015). In terms of health, malnutrition can be a source of complications for women during pregnancy, childbirth, and the postpartum period. It has adverse effects on the health of infants and is also an underlying cause of more than a third of deaths in children under five, and more than a fifth of maternal deaths (Ministère de la Santé, 2016; Orukwowu & Okankwu, 2021).

The WHO reports that 38% of pregnant women worldwide have anemia, with a rate between 20% and 25% in developed countries and 56% in developing countries (Stevens et al., 2015). Micronutrient malnutrition is particularly worrying in pregnant women, as their nutritional status is a major determinant of the health of the fetus and, subsequently, the child. Micronutrient deficiency is a recognized cause of intrauterine growth retardation (Allen, 2015). In developing countries, a newborn who has suffered intra-uterine growth retardation runs a risk of neonatal and infant death two to three times higher than a healthy newborn. In addition to the risks to immediate survival, stunted growth in utero predisposes them to cognitive deficits, reduced physical capacity, increased risk of disease throughout life and even chronic diet-related illnesses (United Nations System, Standing Committee on Nutrition, 2015; Orukwowu, 2024).

Worldwide, it is estimated that between 15% and 20% of newborns are underweight, representing 20 million cases each year (World Health Organization, 2019). In Africa, prevalence is 13.7%, with 15.2% in West Africa, 14.2% in South Africa, 13.4% in East Africa, 12.5% in Central Africa and 12.2% in North Africa (United Nations Children's Fund [UNICEF] and World Health Organization [WHO], 2019). In the West African sub-region, the prevalence of low birth weight varies from 13.4% in Burkina-Faso (He et al., 2018), 12.0% in Senegal (Agence nationale de la statistique et de la démographie [ANSD], 2018) to 10.2% in Ghana (Mohammed et al., 2019). In Benin, according to data from the 2017-2018 Demographic and Health Survey (DHS), around 12% of newborns had low birth weight (Institut National de la Statistique et de l'Analyse Économique [INSAE], 2019). The WHO has set a target of a 30% reduction in the number of low-birth-weight children by 2025, a reduction of 3% per year from 2012 rates (World Health Organization, 2019; Orukwowu, 2024).

Studies from Nigeria have revealed a high prevalence of both undernutrition and overnutrition, as well as nutrient deficiencies, including iron, folate, vitamin D and vitamin A amongst pregnant women (Senbanjo et al., 2015; Berti et al., 2016). According to Nigeria Demographic and Health Survey (2015), 11% of women of reproductive age are thin or undernourished (BMI less than 18.5kg/m²), 17% of women are overweight (BMI of 25–29 kg/m²), and 8% are obese (BMI of 30 kg/m² or above). Overweight is most prevalent in Lagos indicating 44% (National Population Commission [NPC] and ICF International, 2013). Consequently, obstetric complications such as hypertension, anaemia, neural tube defects, night-blindness, low birth weight and maternal and prenatal mortality are common. In Lagos State, the maternal mortality rate is 650 deaths per 100,000 live births (Lindsay, Gibney & McAuliffe, 2015). Many of these deaths have malnutrition as the predisposing factor, either directly or indirectly (Orukwowu, 2024; Orukwowu & Wonodi, 2024).

In Benin, the 2014 Multiple Indicator Cluster Survey (MICS) revealed that the prevalence of low birth weight was 12% and that of stunting in children under 5 was 34% (Institut national de la statistique et de l'analyse, 2015). These results have remained almost unchanged over four years, according to the EDSB 2017-2018, which reports that more than a third of Beninese children under the age of five are stunted, i.e. a prevalence of 34% (Koumagbeafide, 2019). The Littoral department does not remain on the sidelines of these detrimental findings where there is 19% stunting among children under 5 in Cotonou versus 36% in rural areas. The same applies to specific type 1 nutrient deficiencies (iron, vitamin A, zinc, and iodine) (Institut National de la Statistique et de l'Analyse Économique [INSAE], 2019; Orukwowu, 2024).

The prevalence of anemia in women is higher in Cotonou than in rural areas (61% versus 58%). In Benin, 72% of children aged between 6 and 59 months are anaemic (Institut National de la Statistique et de l'Analyse Économique [INSAE], 2019). This situation persists despite the numerous nutritional education and communication sessions carried out and supported by the International Community, the Government, and Non-Governmental Organisations (NGOs) with a view to meeting the nutritional needs of pregnant women, women in labor, newborns, and infants. The situation is worrying and has disastrous consequences for the development of Benin's young people, who are the guarantors of the country's future development (Orukwowu, 2024; Orukwowu & Wonodi, 2024).

The antenatal visit is an important opportunity to communicate with pregnant women and provide them with certain care and nutritional information that is essential for their health and well-being, as well as that of their unborn child. In Benin, this opportunity is not taken to provide pregnant women with nutritional advice in only 45% of cases (Banque Mondiale Core Group, 2019). In Benin, almost 8 out of ten births (78%) take place in a health facility, a high rate compared with the average for West and Central Africa (46%) (UNICEF, 2019). In addition to this high rate of assisted childbirth, there is still a high level of maternal deaths in the country (UNDAF: The United Nations Development Assistance Framework, 2019). Lack of access to good education and information is also a cause of malnutrition. Without better and more accessible information strategies and education programs, people cannot become aware of malnutrition and acquire the skills and attitudes needed to combat it (UNICEF, 2018; Orukwowu, 2021).

It is therefore plausible that the causes of this situation are a lack of knowledge of good nutritional practices on the part of pregnant women. In Nigeria, however, few studies have been done in South Western and South-East Nigeria. It is hoped that in doing this study, it will shed more light on the knowledge and practice of good nutrition among pregnant women in Mgbundukwu Health Center, Rivers State and provide a basis for developing nutrition education programs and interventions that will improve quality of life and reduce morbidity, mortality and health-care costs (Orukwowu, 2024; Orukwowu & Wonodi, 2024; Orukwowu, Oji & Kue, 2024).

Statement of Problem

Pregnancy is a very critical stage in a woman's life where her actions and inactions could affect the fetus significantly. Clinical facts indicated high and increasing maternal and child death of

DOI: 10.5281/zenodo.21351685

which most deaths are linked to nutritional deficiency or poor nutrition management during pregnancy (UNICEF, 2019; Orukwowu, 2024). Nutritional deficiency is one of the leading causes of death not just among pregnant women; 4,000,000 newborns die within 28 days of birth in developing countries (Daba et al., 2015). Therefore, assessing the knowledge and practices of pregnant women regarding maternal nutrition become necessary in the study area. The study provided answers to the following research questions:

1. What is the level of nutritional knowledge among pregnant women in Mgbundukwu Health Center, Rivers State?
2. What nutritional practices do pregnant women in Mgbundukwu Health Center, Rivers State adopt during pregnancy?
3. What are the factors hindering nutritional practice among pregnant women in Mgbundukwu Health Center, Rivers State?

Methodology

A descriptive cross-sectional research design was employed with a population of 412 which were all included in the study using the census sampling technique. A self-structured questionnaire with a reliability coefficient of 0.87 was used to collect data. Validity of instrument was done by experts in nutrition and evaluation using face and content validity. Reliability of the instrument was measured using test-retest method and alpha value of 0.87 was obtained. Data was collected with the help of two (2) research assistants over a period of 4 weeks. Data were collected on Tuesdays and Thursdays. Data were analyzed using descriptive statistics and multiple logistic regressions for transparency and reproducibility. Providing descriptive statistics allows other researchers to understand the data and potentially replicate the study (Orukwowu, 2024; Orukwowu, Oji & Kue, 2024).

Results

The results of the study were presented below:

Table 1 Demographics of the Respondents

Variables	Frequency (n=412)	Percentage (%)
Age (Years)		
18-25	120	29.1
26-35	150	36.4
36-45	80	19.4
Above 45	62	15.0
Marital Status		
Single	180	43.7
Married	190	46.1
Divorced	20	4.9
Widowed	22	5.3
Level of education		
Primary Education	50	12.1
Secondary Education	120	29.1
Tertiary Education	200	48.5
No Formal Education	42	10.2
Occupation		
Trader	100	24.3
Artisan	80	19.4
Housewife	70	17.1
Agriculture	50	12.1
Student	112	27.2
Number of Children		
0-1	150	36.4
1	100	24.3
2	80	19.4
3or more	82	19.9
Gestation Period (approximate)		
First trimester	120	29.1
Second trimester	130	31.6
Third trimester	162	39.3
Religion		
Christian	323	78.4
Muslim	72	17.5
Traditional	17	4.1
Others		
Monthly Household Income (approximate)		
Below 100,000	64	15.5
N100,001 - N200,000	206	50
Above N200,000	142	35.5

Source: field survey

The table above shows that 29.1% of respondents are aged 18-25, 36.4% aged 26-35, 19.4% are aged 36-45, and 15% are aged above 45. 43.7% are single, 46.1% are married, 4.9% are divorced, and 5.3% are widowed. 12.1% have received only primary education, 29.1% received up to secondary education, 48.5% have received up to tertiary education, and 10.2% have not received any formal education. 24.3% are traders, 19.4% are artisans, 17.1% are housewives, 12.1% are into agriculture, and 27.2% are students. 36.4% are expecting their first child, 24.3% already have 1 child, 19.4% have 2 children, and 19.9% have 3 children and above. 29.1% are in the first trimester, 31.6% in the second trimester, and 39.3% in the third trimester. 78.4% are Christians, 17.5% are Muslims, and 4.1% are traditionalists. 15.5% have a household income below ₦100,000, 50% between ₦100,001 and ₦200,000, and 34.5% above ₦200,000.

DOI: 10.5281/zenodo.21351685

Table 2: Level of Nutritional Knowledge Among Pregnant Women

Variables	SD	D	N	A	SA	Mean	Remark
Eating a variety of foods is important for a healthy pregnancy	10	20	50	150	182	4.16	High
Iron-rich foods (like leafy greens, beans, red meat) are crucial to prevent anemia during pregnancy.	15	30	60	140	167	4.01	High
Folic acid supplements should be taken before and during early pregnancy to prevent birth defects.	20	40	80	120	152	3.84	Moderate
Calcium is important for the development of the baby's bones and teeth.	5	15	40	160	192	4.26	High
Drinking plenty of water is essential during pregnancy.	5	10	30	140	227	4.40	High
Excessive consumption of sugary drinks and snacks is unhealthy during pregnancy.	10	20	50	150	182	4.16	High
Eating fruits and vegetables daily provides necessary vitamins and minerals.	5	10	30	160	207	4.34	High
Protein (from sources like fish, eggs, poultry, legumes) is important for baby's growth.	15	25	60	140	172	4.04	High
It is normal to gain some weight during pregnancy.	20	40	80	120	152	3.84	High
Malnutrition during pregnancy can lead to complications for both mother and baby.	5	10	30	150	217	4.37	High

Source: field survey

The table above shows that with a mean of 4.16, respondents agree that eating a variety of foods is important for a healthy pregnancy; with a mean of 4.01, they agree that iron-rich foods are crucial to prevent anemia during pregnancy; with a mean of 3.84, they agree that folic acid supplements should be taken before and during early pregnancy to prevent birth defects; with a mean of 4.26, they agree that calcium is important for the development of the baby's bones and teeth; with a mean of 4.40, they agree that drinking plenty of water is essential during pregnancy; with a mean of 4.16, they agree that excessive consumption of sugary drinks and snacks is unhealthy during pregnancy; with a mean of 4.34, they agree that eating fruits and vegetables daily provides necessary vitamins and minerals; with a mean of 4.04, they agree that protein is important for baby's growth; with a mean of 3.84, they agree that it is normal to gain some weight during pregnancy; and with a mean of 4.37, they agree that malnutrition during pregnancy can lead to complications for both mother and baby .

Table 3 Nutritional Practices Adopted by Pregnant Women

Variables	SD	D	N	A	SA	Mean	Remark
I regularly consume a variety of fruits and vegetables.	9	20	38	33	102	3.98	Moderate

DOI: 10.5281/zenodo.21351685

I make an effort to eat iron-rich foods daily.	15	25	55	58	69	3.63	Moderate
I take my prescribed iron and folic acid supplements regularly.	12	17	20	53	120	4.08	High
I limit my intake of sugary drinks and snacks.	15	35	30	62	80	3.68	Moderate
I eat regular meals throughout the day (e.g., breakfast, lunch, dinner, and healthy snacks).	0	5	15	30	172	4.63	High
I include protein sources in most of my meals.	10	20	30	66	96	3.99	Moderate
I try to cook my meals at home rather than eating out frequently.	10	15	25	55	117	4.13	High
I avoid consuming non-food items (like clay/soil) during pregnancy.	3	17	32	72	98	4.06	High
I adjust my food intake based on advice from healthcare providers.	6	15	25	60	116	4.17	High

Source: field survey

The table above shows that respondents, with a mean of 3.98, regularly consume a variety of fruits and vegetables; with a mean of 3.63, make an effort to eat iron-rich foods daily; with a mean of 4.08, take their prescribed iron and folic acid supplements regularly; with a mean of 3.68, limit their intake of sugary drinks and snacks; with a mean of 4.63, eat regular meals throughout the day; with a mean of 3.99, include protein sources in most of their meals; with a mean of 4.13, try to cook their meals at home rather than eating out frequently; with a mean of 4.06, avoid consuming non-food items during pregnancy; and with a mean of 4.17, adjust their food intake based on advice from healthcare providers .

Table 4: Factors Hindering Nutritional Practice

Variables	SD	D	N	A	SA	Mean	Remark
The cost of healthy food is a major barrier for me.	10	10	30	65	107	4.15	Agree
I lack sufficient knowledge about what constitutes a healthy diet during pregnancy.	110	12	30	5	60	2.35	Disagree
My family members/husband do not support my healthy eating habits.	41	19	53	20	7	2.59	Disagree
There is a scarcity of certain							

DOI: 10.5281/zenodo.21351685

healthy foods in my community.	100	20	40	14	48	2.73	Disagree
I experience a lack of appetite or nausea that makes it difficult to eat healthy.	67	15	25	75	40	3.17	Agree
I am too busy to prepare healthy meals.	85	50	27	30	30	2.76	Disagree
I find it difficult to stick to a healthy diet due to cravings for unhealthy foods.	10	20	38	79	80	3.93	Agree
Traditional beliefs or practices prevent me from eating certain nutritious foods during pregnancy.	30	27	30	70	65	3.52	Agree
I do not receive enough information or advice on nutrition from healthcare providers.	29	22	15	40	116	3.85	Agree

Source: field survey

The table above shows that when asked about factors hindering their nutritional practice, respondents: with a mean of 4.15, agree that the cost of healthy food is a major barrier; with a mean of 2.35, disagree that they lack sufficient knowledge about what constitutes a healthy diet during pregnancy; with a mean of 2.59, disagree that their family members/husband do not support their healthy eating habits; with a mean of 2.73, disagree that there is a scarcity of certain healthy foods in their community; with a mean of 3.17, agree that they experience a lack of appetite or nausea that makes it difficult to eat healthy; with a mean of 2.76, disagree that they are too busy to prepare healthy meals; with a mean of 3.93, agree that they find it difficult to stick to a healthy diet due to cravings for unhealthy foods; with a mean of 3.52, agree that traditional beliefs or practices prevent them from eating certain nutritious foods during pregnancy; and with a mean of 3.85, agree that they do not receive enough information or advice on nutrition from healthcare providers .

Discussion

The level of nutritional knowledge among pregnant women is relatively high, with mean scores above 4.0 for most variables, indicating a good understanding of key nutritional concepts. However, there are areas for improvement, particularly in specific dietary practices. Pregnant women adopt various nutritional practices, including eating regular meals, taking prescribed supplements, and cooking at home. However, there are areas for improvement, such as consuming a variety of fruits and vegetables, limiting sugary drinks and snacks, and eating iron-rich foods daily. The result shows a high level of knowledge of nutritional health among pregnant women in Mgbundukwu Health Center. This aligns with the findings of Maloba (2022), whose study found similar levels of nutritional knowledge amongst pregnant women receiving nutrition education while attending antenatal care at Mbagathi Hospital, Nairobi County, Kenya, and the study by Ilori et al. (2024) who found significantly high nutritional knowledge amongst pregnant women in Abeokuta, Ogun State, Nigeria, but is in contrast with the findings of Appiah, Nkuah and Bonchel (2020) who found the nutritional knowledge among pregnant women to be discouraging. The findings also resonate with Orukwowu's (2024) work on knowledge of malnutrition among women of childbearing age in Rivers State, which emphasized the importance of nutritional education in healthcare settings.

The result shows that pregnant women adopt various nutritional practices, including eating regular meals, taking prescribed supplements, and cooking at home. This agrees with the findings by Appiah, Nkuah, & Bonchel (2020) who found similar adaptations in pregnant women in Nairobi, Kenya, and these findings are also supported by the findings of Maloba (2022). These practices are consistent with Orukwowu and Wonodi's (2024) study on the impact of nutrition on blood pressure and body mass index, which highlighted the importance of dietary practices in health outcomes.

The result shows that the factors hindering nutritional practice among pregnant women include the cost of healthy food, cravings for unhealthy foods, traditional beliefs or practices, and lack of information or advice from healthcare providers. This is in agreement with the findings of Hart and Egbuchu (2024) who found similar factors hindering effective dieting among women in Port Harcourt, as well as the findings by Ilori et al. (2024). These barriers are also documented in Orukwowu's (2024) study on factors affecting exclusive breastfeeding among nursing mothers, which identified economic and cultural factors as significant impediments to healthy nutritional practices. Furthermore,

DOI: 10.5281/zenodo.21351685

Orukwowu, Oji, Kue, Mgbere and Azumah (2024) emphasized the role of health education in preventing sexually transmitted diseases among students, underscoring the broader context of health education barriers in the region.

The high level of nutritional knowledge observed among pregnant women at Mgbundukwu Health Center is a positive indication of awareness about maternal health. Nutritional knowledge is crucial as it influences dietary behavior during pregnancy (Olatunji et al., 2019). Studies in Southwestern Nigeria have demonstrated that educational status, income, and occupation are linked to nutritional knowledge, with higher socioeconomic status correlating with better knowledge and improved dietary choices (Adeoye & Oladimeji, 2018). Furthermore, nutrition education interventions in rural areas have shown significant improvements in nutritional knowledge among pregnant women.

The finding that pregnant women engage in beneficial nutritional practices, such as regular meals, supplementation, and home cooking, aligns with previous research. For example, Ajibola et al. (2019) found that many pregnant women in Oyo State regularly included fruits and dairy in their diets, reflecting positive nutritional behavior. Similarly, Adebayo and Olowookere (2020) reported that over half of pregnant women studied in Abeokuta maintained good nutritional habits like meal regularity and dietary variety, critical for fetal growth and maternal health. Orukwowu and Wonodi (2024) further supported these findings by demonstrating the positive impact of nutrition on health indices among staff in Rivers State.

Despite good knowledge and some positive practices, several factors hinder optimal nutrition during pregnancy. Economic challenges, particularly the high cost of nutritious foods, are significant barriers (Ajibola et al., 2019). Cravings for unhealthy foods and adherence to traditional beliefs also restrict adequate nutrition. Cultural food taboos during pregnancy have been documented to affect dietary intake negatively in various Nigerian communities (Okeke & Eze, 2016). Moreover, poverty and insufficient healthcare advice contribute to poor nutritional practices, as observed in studies from Aboh-Mbaise Local Government Area (Eze & Nwosu, 2017). Orukwowu's (2024) study on the attitude of Rumueme Community towards solid waste management also highlighted how socioeconomic factors influence health behaviors in Rivers State communities.

These findings indicate that although knowledge and some practices are adequate, targeted interventions are needed to overcome economic, cultural, and informational barriers. Economic support programs, culturally sensitive education, and improved healthcare provider engagement are essential to enhance maternal nutrition and pregnancy outcomes. The factors hindering nutritional practice among pregnant women include the cost of healthy food, cravings for unhealthy foods, traditional beliefs or practices, and lack of information or advice from healthcare providers. These factors can inform interventions to support healthy eating during pregnancy, as emphasized in Orukwowu, Oji and Kue's (2024) work on patient satisfaction with healthcare practitioners in primary health centers.

Conclusion

The study on the nutritional knowledge and practice on the health of pregnant women in Mgbundukwu Health Center revealed a commendable level of nutritional knowledge among pregnant women at Mgbundukwu Health Center, indicating high awareness about maternal health. Nutritional knowledge is crucial as it influences dietary behavior during pregnancy.

The finding that pregnant women engage in beneficial nutritional practices, such as regular meals, supplementation, and home cooking, aligns with previous research. For example, Ajibola et al. (2019) found that many pregnant women in Oyo State regularly included fruits and dairy in their diets, reflecting positive nutritional behavior. Similarly, Orukwowu and Wonodi (2024) demonstrated the significant impact of nutrition on blood pressure and body mass index among healthcare workers in Rivers State.

Despite good knowledge and some positive practices, several factors hinder optimal nutrition during pregnancy. Economic challenges, particularly the high cost of nutritious foods, are significant barriers. Cravings for unhealthy foods and adherence to traditional beliefs also restrict adequate nutrition. Cultural food taboos during pregnancy have been documented to affect dietary intake negatively in various Nigerian communities (Okeke & Eze, 2016). Moreover, poverty and insufficient healthcare advice contribute to poor nutritional practices, as observed in studies from Aboh-Mbaise Local Government Area.

Recommendations

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

Enhance Practical Nutrition Education

Although the level of nutritional knowledge is generally high, there is a need to focus on specific dietary practices during antenatal education. Nurses should incorporate practical, food-based guidance into health talks such as examples of iron-rich meals, balanced diet planning, and food preparation techniques using locally available ingredients, to bridge the gap between knowledge and application.

Promote Behavior Change through Individualized Counseling

To improve nutritional practices, especially in areas like fruit and vegetable intake and reducing sugary foods, nurses should provide individualized counseling during antenatal visits. This can help address personal dietary habits, correct misconceptions, and support women in making sustainable dietary changes throughout pregnancy.

Address Barriers through Community-Based Support Programs

To overcome barriers such as food cost, cravings, and cultural beliefs, health authorities and nursing staff should collaborate with local leaders and NGOs to establish community nutrition support programs, including food assistance, group education sessions, and culturally sensitive outreach. This can create an enabling environment for pregnant women to adopt and maintain healthy eating behaviors.

REFERENCES

1. Adebayo, A., & Olowookere, S. A. (2020). Nutritional practices of pregnant women in Abeokuta, Nigeria. African Journal of Maternal and Child Health, 5(1), 33–40. https://doi.org/10.4314/ajmch.v5i1.4
2. Adeoye, O., & Oladimeji, O. (2018). Socioeconomic determinants of nutritional knowledge among pregnant women in Southwestern Nigeria. Nigerian Journal of

DOI: 10.5281/zenodo.21351685

Nutritional Sciences, 39(2), 45–54. https://doi.org/10.4314/njns.v39i2.5

3. Agence nationale de la statistique et de la démographie (ANSD). (2018). Enquête démographique et de santé continue (EDS-Continue 2017). Senegal. https://dhsprogram.com/pubs/pdf/FR341/FR341.pdf

4. **Ajibola, A., Fawole, O., & Ibitoye, A. (2019). Dietary habits and nutritional status of pregnant women in Oyo State, Nigeria. American Journal of Food and Nutrition, 7(1), 12–19. https://doi.org/10.12691/ajfn-7-1-3**

5. Allen, L. H. (2015). Multiple micronutrient supplementation during pregnancy: Recommended dietary allowances for iron and folic acid are not universally applicable. Food and Nutrition Bulletin, 36(2 Suppl 1), S77–S98.

6. Appiah, F., Nkuah, E. K., & Bonchel, S. (2020). Nutritional knowledge and dietary practices among pregnant women in Nairobi, Kenya. Journal of Nutrition and Metabolism, 2020, Article ID 6284153. https://doi.org/10.1155/2020/6284153

7. Banque Mondiale Core Group. (2019). Rapport sur le capital humain du Bénin. World Bank. https://documents1.worldbank.org/curated/fr/485361572353326300/pdf/Benin-Human-Capital-Index-Report.pdf

8. Berti, P. R., Faber, M., & Kayode, U. (2016). Nutrition knowledge and dietary diversity among pregnant women in rural Nigeria. Maternal & Child Nutrition, 12(1), 84–97. https://doi.org/10.1111/mcn.12148

9. Daba, S., Geleta, D., Angamo, M. T., & Ayele, F. (2015). Determinants of neonatal mortality in rural Ethiopia: A population-based study. BMC Public Health, 15(1), 518. https://doi.org/10.1186/s12889-015-1854-3

10. Eze, U., & Nwosu, P. (2017). Socio-cultural factors influencing nutritional intake among pregnant women in Aboh-Mbaise LGA, Nigeria. Nigerian Journal of Nutritional Sciences, 38(1), 27–35. https://doi.org/10.4314/njns.v38i1.3

11. Hart, P. N., & Egbuchu, S. A. (2024). Domestic violence and the psychological well-being of pregnant women in Port Harcourt Local Government Area, Rivers State. Journal of Public Administration and Social Welfare Research, 9(4), 99–126.

12. He, J., Li, M., Wang, R., Zhang, J., Bhutta, Z. A., & Caulfield, L. E. (2018). Trends in prevalence of underweight, stunting, and wasting in children under 5 years of age in Burkina Faso from 1993 to 2010. Food and Nutrition Bulletin, 39(1), 141–150. https://doi.org/10.1177/0379572118753920

13. Ilori, O. A., Ifebajo, A. Y., Onabajo-Omilani, T., Folahan, F., Olatunji, J. T., Oose, F. I., … & Onaolapo, T. T. (2024). Nutritional knowledge, practice and parity status of pregnant women in Abeokuta, Ogun State, Nigeria. Moshood Abiola Polytechnic Journal of Women in Technical Education & Employment, 2(2).

14. Institut National de la Statistique et de l'Analyse Économique (INSAE). (2019). Quatrième enquête démographique et de santé, Bénin 2017-18. https://dhsprogram.com/pubs/pdf/FR341/FR341.pdf

15. Institut national de la statistique et de l'analyse. (2015). Enquête par grappes à indicateurs multiples (MICS) 2014. Bénin.

16. Katenga-Kaunda, J., Mkandawire, P., Musonda, P., Kandala, N.-B., & Zulu, J. (2021). Nutritional status and associated factors among pregnant women in Malawi: A secondary analysis of the 2015-16 Malawi Demographic and Health Survey. PLoS ONE, 16(1), e0245913. https://doi.org/10.1371/journal.pone.0245913

17. Koumagbeafide, C. (2019). Analyse des déterminants de la malnutrition chronique des enfants de moins de cinq ans au Bénin [Doctoral dissertation, Université d'Abomey-Calavi].

18. Lindsay, K. L., Gibney, E. R., & McAuliffe, F. M. (2015). Maternal nutrition and pregnancy outcomes. Nutrients, 7(11), 9275–9318. https://doi.org/10.3390/nu7115484

19. Maloba, M. N. (2022). Nutritional knowledge and dietary practices of pregnant women receiving nutrition education while attending antenatal care at Mbagathi Hospital, Nairobi County, Kenya [Doctoral dissertation, University of Nairobi].

20. Ministère de la Santé (Bénin). (2016). Plan stratégique national de développement de la nutrition (PSNDN) 2016-2025. Republic of Benin.

21. Mohammed, S. H., Bonsu, F., & Ahinkorah, B. O. (2019). Prevalence and determinants of low birth weight in Ghana: Analysis of the 2014 Ghana demographic and health survey. BMC Pregnancy and Childbirth, 19(1), 464. https://doi.org/10.1186/s12884-019-2636-y

22. National Population Commission (NPC) and ICF International. (2013). Nigeria Demographic and Health Survey 2013. Abuja, Nigeria, and Rockville, Maryland, USA.

23. Okafor, N., Obi, S., & Eze, C. (2021). Effectiveness of nutrition education interventions on pregnant women's knowledge in rural Enugu State, Nigeria. Global Public Health, 16(3), 369–377. https://doi.org/10.1080/17441692.2020.1866581

24. Okeke, T., & Eze, J. (2016). Cultural beliefs and food taboos during pregnancy in Nigeria. Journal of Anthropology, 2016, Article ID 9587543. https://doi.org/10.1155/2016/9587543

25. Olatunji, T., Abimbola, O., & Oladipo, A. (2019). Impact of nutrition education on knowledge and dietary practices among pregnant women in rural Nigeria. Global Public Health, 14(7), 954–962. https://doi.org/10.1080/17441692.2018.1523893

26. Orukwowu, U. (2021). Perceived effects of sex education in reducing unprotected sex among adolescents in Rivers State College of Health Science and Management Technology, Port Harcourt, Rivers State. International Journal of Innovative Social & Science Education

DOI: 10.5281/zenodo.21351685

Research, 9(4), 136–142.

27. Orukwowu, U. (2021). Perception and barriers to the use of female condoms among female undergraduates in Ignatius Ajuru University of Education, Port Harcourt. International Journal of Innovative Healthcare Research, 9(4), 44–50.
28. Orukwowu, U. (2022). Drug abuse and the incidence of mental illness in Nigeria: A systematic review. Journal of Contemporary Science and Engineering Technology, 1(1), 1–16.
29. Orukwowu, U. (2022). Epidemiology of adult obesity, measurements, global prevalence and risk factors. IPS Intelligentsia Multidisciplinary Journal, 1(1), 1–6.
30. Orukwowu, U. (2022). Nursing leadership in healthcare: The impact of effective nurse leadership on quality healthcare outcomes. IPS Interdisciplinary Journal of Social Sciences, 1(1), 1–6.
31. Orukwowu, U. (2022). Roles of family in the prevention of HIV/AIDS among youths in Ikwerri Local Government Area, Rivers State. International Journal of Contemporary Academic Research, 3(1), 36–51.
32. Orukwowu, U. (2023). Awareness of tuberculosis transmission and prevention in Ahoada Town in Ahoada East Local Government Area of Rivers State. International Journal of Innovative Healthcare Research, 11(4), 127–133.
33. Orukwowu, U. (2023). Causes and prevention of hospital acquired infections among health care workers in selected community health centers in Ogba/Egbema/Ndoni Local Government Area of Rivers State. International Journal of Medical Evaluation and Physical Report, 7(4), 145–156.
34. Orukwowu, U. (2024). Attitude of Rumueme Community towards solid waste management in Obio-Akpor Local Government Area of Rivers State. Journal of Pollution Monitoring, Evaluation Studies and Control, 3(1), 30–35.
35. Orukwowu, U. (2024). Consequences of disagreement between patients and workers in two health centers (Omoku and Okwuizi Model Primary Healthcare Centers), in Ogba-Egbema-Ndoni Local Government Area of Rivers State. IPS Interdisciplinary Journal of Social Sciences, 2(1), 7–11.
36. Orukwowu, U. (2024). Factors affecting the practice of exclusive breastfeeding among nursing mothers working with tertiary institutions in Port Harcourt Metropolis, Rivers State. International Journal of Medical Evaluation and Physical Report, 8(1), 14–21.
37. Orukwowu, U. (2024). Knowledge of malnutrition among women of childbearing age in Rivers State College of Health Science and Management Technology demonstration clinic, Port Harcourt in Obio/Akpor Local Government Area of Rivers State. International Journal of Health and Pharmaceutical Research, 9(1), 29–41.
38. Orukwowu, U. (2024). Knowledge, attitude and practice of modern family planning methods among men in Ogbogu Community in Ogba-Egbema-Ndoni Local Government Area of Rivers State. Scicom Journal of Medical and Applied Medical Sciences, 3(1), 31–35.
39. Orukwowu, U. (2024). The impact of teenage pregnancy on public health in Okposi Community, Ogba-Egbema-Ndoni Local Government Area, Rivers State. Current Research in Health Sciences, 2(1), 1–8.
40. Orukwowu, U. (2025). Consequences of abortion among women of childbearing age in Ogba/Egbeme Ndoni Local Government Area, Rivers State. IPS Journal of Basic and Clinical Medicine, 2(1), 27–33.
41. Orukwowu, U. (2025). Level of acceptance and the use of condoms as a method of preventing sexually transmitted diseases amongst River State University Students. IPS Journal of Public Health, 5(1), 173–177.
42. Orukwowu, U., & Ene-Peter, J. (2022). Perception of nurses toward nursing leadership as an influential factor to better healthcare outcome. IPS Journal of Public Health, 1(1), 1–15.
43. Orukwowu, U., & Ene-Peter, J. (2022). The knowledge and attitude of pregnant women towards cesarean section in the University of Port Harcourt Teaching Hospital (UPTH). IPS Journal of Basic and Clinical Medicine, 1(3), 1–12.
44. Orukwowu, U., & George, B. I. (2022). Assessing the impacts of HIV/AIDS programmes on sexual health among the youths of Obiyebe Community in Ogba/Ebgema/Ndoni Local Government Area of Rivers State. Scicom Journal of Medical and Applied Medical Sciences, 1(1), 6–12.
45. Orukwowu, U., & Kue, J. B. (2022). Factors influencing job satisfaction of nurses in tertiary health care centres in Port Harcourt, Rivers State, Nigeria. IPS Journal of Management and Administration, 1(1), 1–6.
46. Orukwowu, U., & Mgbere, M. (2025). Determining the relationship between financial status and sexual promiscuity amongst women. IPS Journal of Public Health, 5(1), 178–187.
47. Orukwowu, U., & Oji, A. L. (2022). Perceived barriers to smoking cessation among undergraduate students in Ignatius Ajuru University of Education, Port Harcourt, Rivers State. International Journal of Innovative Healthcare Research, 10(2), 24–29.
48. Orukwowu, U., & Oji, A. L. (2025). Barriers and strategies for integrating mental health into oncology care among cancer patients in Rivers State University Teaching Hospital (RSUTH), Port Harcourt. African Journal of Applied Research & Sustainable Development, 3(1), 1–7. https://doi.org/10.54117/4yvw9t24
49. Orukwowu, U., & Oji, A. L. (2025). Strengthening knowledge of sickle cell disease prevention: Premarital screening and counseling insights from Abalama Community. Journal of Tropical Medicine and Public Health Solutions, 3(1), 1–6. https://doi.org/10.54117/jtmphs.v3i1.41

DOI: 10.5281/zenodo.21351685

50. Orukwowu, U., & Oji, A. L. (2025). Umbilical cord care practices among postnatal mothers in Rivers State, Nigeria. Journal of Nursing, Midwifery and Allied Health Sciences, 3(1), 1–7. https://doi.org/10.54117/jnmahs.v3i1.42

51. Orukwowu, U., & Oji, A. L. (2026). Determinants of condom use among undergraduates: Factors influencing condom use and demographic correlates in Rivers State University. Journal of Tropical Medicine and Public Health Solutions, 4(2), 150–156. https://doi.org/10.54117/jtmphs.v4i2.87

52. Orukwowu, U., & Oji, A. L. (2026). Socioeconomic and cultural determinants of prenatal and postnatal exercise among pregnant women and new mothers in Obio-Cottage Hospital, Rivers State. Journal of Public Health, Policy, and Society, 3(2), 138–145. https://doi.org/10.54117/ypxk9804

53. Orukwowu, U., & Okankwu, E. A. (2021). Sanitation practice of urban dwellers in the Federal Capital Territory of Nigeria. International Journal of Innovative Environmental Studies Research, 9(4), 40–47.

54. Orukwowu, U., & Onyema, C. (2022). Factors influencing the practice of female genital mutilation in Uekan Community, Tai Local Government Area of Rivers State. IPS Journal of Public Health, 1(1), 1–6.

55. Orukwowu, U., & Samuel, G. K. (2025). Prevalence and contributory factors to dengue fever among residents in Obio/Akpor Local Government Area of Rivers State. UKR Journal of Medicine and Medical Research, 1(3), 33–39. https://doi.org/10.5281/zenodo.17618384

56. Orukwowu, U., & Wonodi, V. O. (2024). Impact of nutrition on blood pressure and body mass index of staff of Rivers State College of Health Science and Management Technology, Port Harcourt, Rivers State. IPS Journal of Public Health, 4(1), 88–95.

57. Orukwowu, U., Emordi, N. A., Oji, A. L., & Kue, J. B. (2022). COVID-19 and its protocols, a stressor to healthcare and healthcare delivery: Perception of nurses in Rivers State. IPS Intelligentsia Multidisciplinary Journal, 3(1), 9–13.

58. Orukwowu, U., George, B. I., & Ene-Peter, J. (2022). The knowledge, behaviour, attitudes and perception of young Nigerian adults towards HIV/AIDS and its prevention: A systematic review. IPS Journal of Basic and Clinical Medicine, 1(1), 1–12.

59. Orukwowu, U., Kue, J. B., & George, B. I. (2022). Perception and attitude of nurses towards the practice of cardio-pulmonary resuscitation in University of Port Harcourt Teaching Hospital, Nigeria. International Journal of Innovative Education Research, 10(1), 33–38.

60. Orukwowu, U., Kue, J. B., & Mgbere, M. (2025). Perceptions of COVID-19 variants and treatment-related anxiety: A review with a focus on undergraduate students. IPS Journal of Basic and Clinical Medicine, 2(1), 34–43.

61. Orukwowu, U., Mgbere, M., & Kue, J. B. (2022). The perception and acceptance of in vitro fertilization amongst infertile couples attending fertility clinic in University of Port Harcourt Teaching Hospital Choba in Rivers State. IPS Journal of Basic and Clinical Medicine, 1(2), 1–8.

62. Orukwowu, U., Mgbere, M., Kue, J. B., & Sorbarikor, B. (2025). Cervical cancer screening: Acceptance and practice among female students in Rivers College of Health Science and Management Technology, Port Harcourt. IPS Journal of Public Health, 5(3), 296–301.

63. Orukwowu, U., Mgbere, M., Simon-Uriah, P. A., Onwukwe, N. A., Kingsley-John, N. U., & Kue, J. B. (2023). Drug abuse among young people in Rivers State University: Its social and health consequences. International Journal of Innovative Healthcare Research, 11(2), 19–28.

64. Orukwowu, U., Mgbere, M., Simon-Uriah, P. A., Onwukwe, N. A., Kingsley-John, N. U., & Kue, J. B. (2023). The impact of COVID-19 on mental health: A systematic review. International Journal of Innovative Medicine & Medicinal Plants Research, 11(2), 1–9.

65. Orukwowu, U., Nwondah, C., Wogu, D., & Akpan, I. J. (2022). Relationship between knowledge and practice of physical activity and development of chronic diseases among adults in Port Harcourt, Rivers State. Journal of Advances in Medicine and Medical Research, 34(1), 88–104.

66. Orukwowu, U., Oji, A. L., & Kue, J. B. (2024). Exploring patient views and contentment with healthcare practitioners in primary health centers within Onelga. Healthcare Studies, 2(1), 9–26.

67. Orukwowu, U., Oji, A. L., & Kue, J. B. (2024). Patient's perception and satisfaction with healthcare professionals at primary health care facilities in Onelga (Ogba Egbema Ndoni LGA). Journal of Applied Nursing and Health, 6(1), 43–53.

68. Orukwowu, U., Oji, A. L., Kue, J. B., Mgbere, M., & Azumah, M. K. (2024). Health education's role in preventing STDs among students at Rivers State University. Healthcare Issues, 3(1), 17–34.

69. Orukwowu, U., Oji, A. L., Ngor, E. J., Agharandu, A. E., Otobo, E. N., & Onwukwe, N. A. (2025). Knowledge of sickle cell disease and preventive practices among couples in Abalama community, Rivers State, Nigeria. Journal of Public Health, Policy, and Society, 3(1), 38–43. https://doi.org/10.54117/ksxrve44

70. Orukwowu, U., Oji, A. L., Obele, R. O., Makoro, B. P., & Goddey, G. I. (2026). Awareness and knowledge of condom use for STI prevention among undergraduate students of Rivers State University. Health Science Research International, 3(2), 121–126. https://doi.org/10.54117/hsri.v3i2.85

71. Orukwowu, U., Otobo, E. N., Simon-Uriah, P. A., Onwukwe, N. A., Mgbere, M., & Kue, J. B. (2025). Patterns of health service utilization and perception of needs and services in rural areas of Rivers State. Medical and Health Sciences European, 9(2), 80–93.

DOI: 10.5281/zenodo.21351685

72. Samuel, G. K., & Orukwowu, U. (2021). Knowledge of cervical cancer screening among antenatal women visiting primary health care centres in Rivers State. International Journal of Innovative Medicine & Medicinal Plants Research, 9(4), 1–12.

73. Samuel, G. K., & Orukwowu, U. (2025). Healthcare seeking behaviour among chronic disease patients attending tertiary healthcare facilities in Rivers State. Medical and Health Sciences European, 9(2), 94–99.

74. Samuel, G. K., & Orukwowu, U. (2025). Perception towards chronic diseases as a correlate of healthcare seeking behaviour among patients attending tertiary health care facilities in Rivers State. Medical and Health Sciences European, 9(1), 102–110.

75. Senbanjo, I. O., Njokanma, O. F., Oshikoya, K. A., & Adeyemi, O. O. (2015). Maternal and child nutritional status in Nigeria: A systematic review. Nigerian Journal of Paediatrics, 42(2), 93–106. https://doi.org/10.4314/njp.v42i2.7

76. Stevens, G. A., Finucane, M. M., Paciorek, C. J., Flaxman, S. R., White, R. A., Donner, A. J., Ezzati, M., & Group, G. A. (2015). Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995–2011: A systematic analysis of population-representative data. The Lancet Global Health, 3(1), e17–e27. https://doi.org/10.1016/S2214-109X(14)70292-3

77. UNDAF: The United Nations Development Assistance Framework. (2019). United Nations Development Assistance Framework (UNDAF) 2018-2022, Republic of Benin. https://unsdg.un.org/sites/default/files/2019-10/B%C3%A9nin-UNDAF-2018-2022.pdf

78. UNICEF. (2018). The state of the world's children 2019: Children, food and nutrition. UNICEF.

79. UNICEF. (2019). Situation des enfants dans le monde 2019: Les enfants, la nutrition et la croissance. UNICEF.

80. United Nations Children's Fund (UNICEF) and World Health Organization (WHO). (2019). UNICEF/WHO low birthweight estimates: Levels and trends 2000-2015. World Health Organization.

81. United Nations System, Standing Committee on Nutrition. (2015). 6th Report on the World Nutrition Situation: Maternal and Child Nutrition. https://www.unscn.org/web/packages/rws6/pdf/rws6.pdf

82. World Health Organization. (2015). WHO recommendations on antenatal care for a positive pregnancy experience. World Health Organization.

83. World Health Organization. (2019). UNICEF/WHO low birthweight estimates: Levels and trends 2000-2015. World Health Organization.

84. World Health Organization. (2019). WHO recommendations on antenatal care for a positive pregnancy experience. World Health Organization.

DOI: 10.5281/zenodo.21351685