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Knowledge Practice Gap in Maternal Nutrition Among Pregnant Women Attending Antenatal care in Ihiagwa, Owerri West Nigeria: A Cross-Sectional Study

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Abstract- ***Maternal nutrition remains a critical determinant of pregnancy outcomes, particularly in low- and middle-income countries where preventable complications continue to contribute to maternal and neonatal morbidity and mortality. This study assessed the nutritional knowledge and uptake of required nutrition practices among pregnant women attending antenatal services at Ihiagwa Primary Health Centre, Imo State, Nigeria. A descriptive cross-sectional design was adopted, and 404 pregnant women were recruited using a convenience sampling technique. Data were collected using a semi-structured questionnaire and analyzed with SPSS version 22.0. Findings revealed that 98.0% (396) of respondents had heard about good nutrition during pregnancy. However, despite this high level of awareness, dietary practices were suboptimal. Although 67.6% reported eating three meals daily, the most commonly consumed foods were starch-based, including bread (23.4%), rice (19.8%), and pasta (19.1%), indicating limited dietary diversity. Statistical analysis showed significant associations between nutritional knowledge and socio-demographic factors such as age (p = 0.004), parity (p = 0.003), and educational level (p = 0.0073). While awareness of good nutrition was high among pregnant women attending antenatal services at Ihiagwa Primary Health Centre, knowledge depth and practical implementation remained inadequate. Nutritional counseling and targeted dietary education during antenatal visits should be strengthened to improve maternal nutritional practices and pregnancy outcomes.***

Keywords: Maternal Nutrition, Pregnancy, Antenatal Care, Nutritional Practice

I. INTRODUCTION

Maternal nutrition plays a central role in determining the health outcomes of both mother and child [1]. Adequate nutrition during pregnancy supports fetal growth, prevents complications such as anemia and low birth weight and reduces the risk of maternal mortality [1,2]. Globally, poor maternal nutrition has been associated with adverse pregnancy outcomes, including intrauterine growth restriction, preterm birth and increased infant mortality [1,3].

Pregnancy significantly increases nutritional requirements due to physiological changes, increased maternal blood volume, and fetal development. Nutrients such as protein, iron, folic acid, calcium, vitamins, and adequate energy intake are essential during this period. However, in many developing settings, socioeconomic challenges, food insecurity, cultural practices, and limited nutrition education hinder optimal dietary practices among pregnant women [4].

In Nigeria, maternal malnutrition remains a public health concern. Factors such as poverty, low educational attainment, and limited access to quality antenatal counseling contribute to poor dietary practices [4,]. Although many women may have heard about the importance of good nutrition in pregnancy, awareness does not always translate into adequate dietary behaviour [5].

Despite the importance of maternal nutrition, there is limited evidence on the nutritional knowledge and dietary practices of pregnant women in Ihiagwa, Imo State. This study was therefore conducted to determine the level of nutritional knowledge and uptake of required nutrition practices among pregnant women attending antenatal services at Ihiagwa Primary Health Centre.

II. METHODOLOGY

A descriptive cross sectional study design was employed to assess nutritional knowledge and uptake of recommended nutrition practices among pregnant

women attending antenatal services at Ihiagwa Primary Health Centre.

The study was conducted at Ihiagwa Primary Health Centre, located in Ihiagwa town, Owerri West Local Government Area of Imo State, Nigeria (5.4006° N, 7.0122° E). The facility provides primary healthcare services to Ihiagwa and surrounding communities including Umuelem, Umuchima, Mboke, Nnkaramochie, Iriamogu, Aku/Umuokwo, Ibuzo, and Umuezeawula. The population is predominantly Igbo. The centre offers essential drug services, antenatal care, immunization, laboratory services, public health services, referral services, and operates units such as the labour ward, public health unit, nursing unit, paediatric ward, and administrative unit.

The study population comprised pregnant women aged 15 years and above attending antenatal clinics at Ihiagwa Primary Health Centre during the study period.

Pregnant women aged 15 years and above who attended antenatal services during the study period and provided informed consent were included. Women who were critically ill, mentally challenged, or declined participation were excluded.

A. Sample Size Determination

The sample size was calculated using Cochran's formula for single population proportion:

$$n = \frac{Z^2 Pq}{d^2}$$

Using a prevalence (P) of 14 percent from a previous study, 95 percent confidence level (Z = 1.96), and 5 percent margin of error, the minimum sample size was calculated as 385. After adjusting for a 10 percent non response rate, the final sample size was 406 participants.

B. Sampling Technique

A non-probability convenience sampling technique was used to recruit eligible pregnant women attending antenatal clinic until the required sample size was achieved. Convenience sampling was appropriate because the study population was relatively small and limited to pregnant women attending antenatal clinic at Ihiagwa Primary Health Centres during the study period. The clinic operates on scheduled days with a manageable number of attendees, making it feasible to recruit all eligible and consenting women consecutively until the required sample size was achieved. Since the study focused on a facility based population rather than the wider community, this approach was practical, time efficient, and suitable for achieving the study objectives.

C. Data collection Instrument and Procedure

Data were collected using an interviewer administered semi structured questionnaire developed from the study objectives. The instrument comprised four sections covering socio demographic characteristics, nutritional knowledge, dietary practices, and factors influencing uptake of recommended nutrition practices. Data were collected through face-to-face interviews with the assistance of a trained field assistant.

Face and content validity of the questionnaire were assessed by the project supervisor and two public health experts. Reliability was determined using the test retest method among 10 percent of the sample in a similar setting outside the study area. Internal consistency was assessed using Cronbach alpha.

Data were analyzed using Statistical Package for the Social Sciences version 22. Descriptive statistics including frequencies and percentages were computed. Chi square test was used to determine associations between variables. Statistical significance was set at $p < 0.05$.

Ethical approval was obtained from the Department of Public Health, Federal University of Technology Owerri. Informed consent was obtained from all participants. Confidentiality and anonymity were ensured throughout the study.

III. RESULTS

Table 1 below shows the socio-demographic characteristics of respondents. Among the respondents, The majority of respondents were aged 25 to 34 years (47.6%), followed by 35 to 44 years (31.9%), while only 5.4% were aged 15 to 24 years and 15.1% were 45 to 49 years; none were aged 50 years or above. Most participants were Christians (87.4%) and predominantly of Igbo ethnicity (84.0%).

The marital status, 92.6% were married, 4.2% were single, while smaller proportions were separated, widowed, or reported other categories. Furthermore,44.6% had 4-6 children, and 39.6% had 1-3 children while 10.1% more than six children.Over 70% of the respondents' spouses had at least a tertiary or secondary education. Occupationally, majority of the respondents were mainly traders (35.2%), 23.5% v civil servants. Over half of the respondents (51.9%) reported dissatisfaction with their income

Socio-Demographic Characteristics of the Respondents

Characteristics	Frequency (n=404)	Percentage (%)
Age		
15-24	22	5.4
25-34	192	47.6
35-44	129	31.9
45-49	61	15.1
Total	404	100
Religion		
Christianity	353	87.4
Muslim	32	7.9
Traditional	7	1.7
Others	12	3.0
Total	404	100
Ethnicity		
Igbo	341	84
Hausa	6	1.5
Yoruba	31	7.7
Fulani	0	0.0
Others	26	6.4
Total	404	100
Marital status		
Married	374	92.6
Single	17	4.2
Separated	8	2.0
Widowed	5	1.2
Total	404	100
Number of Children (Parity)		
None	23	5.7
1-3	160	39.6
4-6	180	44.6
>6	41	10.1
Total	404	100
Educational level		
Informal education	116	28.7
Primary	99	24.5
Secondary	13	3.2
Tertiary	176	43.6
Total	404	100
Educational level of Husband		
Informal education	44	10.8
Primary	73	18.1
Secondary	138	34.3
Tertiary	149	36.8
Total	404	100
Occupation		
Student	53	13.1
Farmer	64	15.8
Trader	142	35.2
Civil servant	95	23.5
Unemployed	47	11.7
Others	3	0.7
Total	404	100
Are you satisfied with your monthly income?		
Yes	194	48.0
No	210	51.9
Total	404	100

Table 2 below summarizes findings on the nutritional knowledge of the respondents. The findings showed that 98.0% of the respondents reported they had heard about good nutrition in pregnancy, while 2.0% (8) had not. When asked how they heard about good nutrition in pregnancy, 23.5% (95) reported the Primary Health care centres 19.1 (77) from Newspaper/Magazines, 18.8% (76) others, 14.8% (60) from Television/Radio, while 9.4% (38). Majority of the respondents 90% (363) reported it was advisable to eat more food during pregnancy, while 10% (41) said 'no'. 26.4% (107) of the women opined they doubled their caloric intake while pregnant, 17.5% (71) increased by 700 calories daily, 16.5% (67) 300 calories, 11.5% (47) 500 calories daily, and 13.0% (53) halved their caloric intake. 14.8% (60) of the women did not increase their caloric intake during pregnancy. When the women were asked concerning limited consumption of food during pregnancy, 42.5% (172) mentioned chocolate, 26.2% (106) coffee and chocolate, 14.7% (59) of the

women said "certain types of fish", and 16.4% (67) listed all options. 29.1% (118) of the women reported that the statement 'taking less than 200mg of caffeine is okay during pregnancy' was true, 23.5% (95) agreed with the statement 'medium rare steak is okay as long as it is professionally prepared', 18.7% (76) said it was true that most drugs/medicines are okay during pregnancy as long as they are legal, 18.5% (75) also affirmed that it was okay to to eat all types of fish during pregnancy, and 9.9% (40) reported it was true that eggs with a runny yolk are okay during pregnancy because the white had been cooked. 86.3% (349) of the respondents had heard or read that taking the vitamin folic acid can help prevent some birth defects, while 13.7% (55) reported otherwise. 55.6% (225) of the women opined that the reason some health experts recommend taking folic acid was to prevent birth defects, 29.3% (119) said "to make strong bones", and 14.9% (60) reported 'to prevent blood pressure'. When the women were asked for reasons they thought should make them take multivitamins in pregnancy, 24.7% (100) reported that it helped keep the baby healthy, 20.6% (83) reported it was good for the general health, 19.0% (77) said "encouragements from friends and family", 17.4% (71) reported encouragements from health care workers, 9.7% (39) reported 'someone who does not eat the right foods', and 8.3% (34) reported it prevented heart disease.

Nutritional Knowledge among Pregnant Women Attending Antenatal Services

Variables	Frequency (n=404)	Percentage (%)
Aware of Good Nutrition in Pregnancy		
Yes	396	98.0
No	8	2.0
Total	404	100
Information source on good nutrition in pregnancy		
Healthcare provider	95	23.5
Magazines/Newspaper	77	19.1
Family/Friends	38	9.4
Radio/Television	60	14.8
Book	58	14.4
Others	76	18.8
Total	404	100
Eat more food during pregnancy?		
Yes	363	90
No	41	10
Total	404	100
increase caloric intake for Pregnant mothers		
300 calories daily	67	16.6
500 calories daily	47	11.6
700 calories daily	71	17.5
Halve their caloric intake	53	13.1
Double their caloric intake	107	26.4
None	60	14.8
Total	404	100
Foods consumed in limited quantities		
Certain types of fish	59	14.6
Chocolate	172	42.5
Coffee and chocolate	106	26.2
All of the above	67	16.7
Total	404	100
Most drugs/medicines are okay during pregnancy as long as they are legal	76	18.7
Less than 200mg of caffeine is okay during pregnancy	118	29.1
Eggs with a runny yolk are okay during pregnancy because the white has been cooked	40	9.9
All types of fish are okay to eat during pregnancy	75	18.5
Medium rare steak is okay as long as it is professionally prepared	95	23.5
Folic acid can help prevent some birth defects		
Yes	349	86.3
No	55	13.7
Total	404	100

Folic acid makes strong bones	119	29.3
Folic acid prevents birth defects	225	55.6
Folic acid prevent blood pressure	60	14.9
Benefits of multivitamins in pregnancy		
Someone who does not eat the right foods	39	9.7
It prevents heart disease	34	8.3
It's good for the general health	83	20.6
It helps keep the baby healthy	100	24.7
Encouragements from family and friends	77	19.0
Encouragements from health care workers	71	17.4
Total	404	100

Table 3 below summarized nutritional practices of the respondents. The assessment of dietary practices showed that most respondents (67.6%) consumed three meals daily, while 18.2% ate more than three times per day. Multivitamin use was suboptimal, with only 33.8% reporting daily intake. However, adherence to folic acid supplementation was relatively high, as 63.1% reported daily use. Food consumption patterns revealed a predominance of starch-based foods, particularly bread (23.4%), rice(19.8%), and pasta (19.1%) with relatively lower emphasis on protein-rich foods, fruits, and vegetables.

Table 3 shows nutritional practices of the respondents.

Variable	Frequency	Percentage
Meal frequency per day		
Once	0	0.0
Twice	57	14.1
Thrice	274	67.8
More than three times	73	18.1
Total	404	100
Heard about good nutritional practice in pregnancy		
Before I became pregnant	48	11.9
During my pregnancy	242	59.9
After my pregnancy last was over	113	28.0
Total	404	100
Multivitamins intake per week		
One to three times a week	177	43.7
Four to six times a week	63	15.6
Every day of the week	137	33.8
I did not take a multivitamin at all	27	6.6
Total	404	100
Folic acid intake		
I did not take folic acid at all	5	3.2
One to three times a week	20	13.3
Four to six times a week	30	20.2
Every day of the week	92	63.1
Total	404	100
Hygiene and sanitation		
Yes	349	86.4
No	0	0
Not always	58	13.47
Total	404	100

Table 4 shows the mean daily food intake of the respondents

Table 4: Mean daily servings of selected foods by food group among respondents

Food group	Food item	Mean servings/day	Frequency	Percentage (%)
Cereals and grain products	Bread	5	95	23.4
	Rice	7	80	19.8

Food group	Food item	Mean servings/day	Frequency	Percentage (%)
	Pasta	5	77	19.1
	Breakfast cereals	4	72	17.7
Roots and tubers	Potatoes	3	40	9.9
	Yam and tuber crops	3	33	8.0
	Fried potatoes (chips)	4	22	5.4
Legumes and plant proteins	Legumes	4	20	4.8
Vegetables	Vegetables	5	65	16.1
Fruits	Fresh fruits	4	74	18.3
Animal source foods	Poultry	5	65	16.2
	Fish and seafood	4	39	9.5
	Cheese	2	14	3.4
Sugary and ultra processed foods	Sweets, chocolates and jam	2	19	4.7
	Sugar sweetened beverages	5	12	2.8

*Values represent mean servings consumed per day and the proportion of respondents rconsuming each food item

Table 5 showing association between Knowledge and Socio-Demographic Factors

There was a statistically significant relationship between age (p = 0.0045), Parity (p = 0.00268) and educational level (p = 0.0073) and nutritional knowledge among the respondents.

Table 5 showing association between Knowledge and Socio-Demographic Factors

Socio Demographic characteristics	level of nutritional knowledge		X2	P-value
	Good(%)	Poor (%)		
Age	354(87.5)	50(12.5)	2.00	0.004*
Marital Status	209(51.8)	195(48.2	0.74	0.301
Number of Children (Parity)	384(95.1)	20(4.9)	0.83	0.002*
Occupation	236(58.3)	168(41.7)	6.32	0.295
Level of Education	324(80.2)	80(19.8)	7.00	0.007*

IV. DISCUSSION

This study assessed the nutritional knowledge and uptake of recommended nutrition practices among pregnant women attending antenatal services at Ihiagwa Primary Health Centres. The findings showed very high awareness of good nutrition during pregnancy but suboptimal dietary practices. Significant associations were observed between nutritional knowledge and selected socio demographic factors, particularly age, parity and educational level. These results highlight a observable knowledge practice gap in maternal nutrition within the study setting.

The socio demographic characteristics of respondents (Table 1) indicated that most women were within the active reproductive age group of 25 to 34 years and predominantly married. Tis aligns with previous studies in Nigeria and other low- and middle-income countries (LMICs) where the majority of pregnant women fall within this reproductive age bracket and are married (6, 7). However, the relatively high

proportion of women with informal or low education in this study contrasts with findings from some urban Nigerian settings that reported higher tertiary education levels among antenatal attendees (8). Educational attainment is widely recognized as a key social determinant of maternal health behaviours because it improves health literacy and decision making capacity (9). The notable level of income dissatisfaction among respondents further suggests underlying economic vulnerability that may influence food choices and diet quality during pregnancy.

Findings on nutritional knowledge (Table 2) showed that nearly all respondents had heard about good nutrition in pregnancy, with healthcare providers being the major information source. This is consistent with recent studies in sub-Saharan Africa reporting high awareness levels among antenatal clinic attendees (10, 11). Nevertheless, important knowledge gaps were observed regarding appropriate caloric increase and food safety. Similar inconsistencies between awareness and depth of knowledge have been reported in Nigeria (12). The persistence of partial knowledge despite high exposure may reflect the limited depth and practical orientation of routine antenatal nutrition counselling, which is often constrained by time and staffing limitations (13). Behaviour change frameworks emphasize that awareness alone is insufficient to drive dietary behaviour without supportive skills and enabling environments (14).

The assessment of nutritional practices (Table 3) revealed that although most women consumed three meals daily, adherence to recommended micronutrient supplementation was inconsistent, particularly for multivitamins. Comparable studies across LMICs have documented similar patterns where meal frequency appears adequate but diet quality and supplement adherence remain suboptimal (15,16). However, the relatively high daily use of folic acid in this study contrasts with findings from some rural African settings where adherence was considerably lower (17). This difference may reflect effective folic acid distribution during antenatal visits in the study facility. The observed knowledge practice gap may be explained by behavioural and structural barriers such as food affordability, cultural food beliefs and limited dietary self efficacy, which have been widely documented among pregnant women in LMICs (18).

Analysis of mean daily food intake (Table 4) demonstrated a clear predominance of cereal based and starchy foods, with comparatively lower intake of protein rich foods, fruits, and vegetables. This pattern aligns with the 2022 Nigeria National Food Consumption and Micronutrient Survey, which reported low dietary diversity among women of reproductive age (19). Similar dietary reliance on staples has also been reported in other Nigerian studies (20). However, the moderate fruit consumption observed in this study is somewhat higher than reports from some northern Nigerian populations where fruit intake was markedly low (21). The heavy reliance on staples is likely economically driven, as carbohydrate rich foods are generally more affordable and culturally preferred. Such dietary monotony may predispose pregnant women to micronutrient inadequacies despite adequate caloric intake, consistent with global maternal nutrition evidence (22)

The association analysis (Table 5) showed that age, parity, and educational level were significantly related to nutritional knowledge, while marital status and occupation were not. Similar associations have been reported in recent studies where older and more educated women demonstrated better maternal nutrition knowledge (10,11). In contrast, Gideon et al. (2020) reported no significant association between parity and nutrition knowledge. The positive association observed in this study may be explained by experiential learning, as multiparous women are more likely to have repeated exposure to antenatal counselling and prior pregnancy experience. Education likely enhances comprehension of health information and improves maternal health seeking behaviour, a relationship consistently documented in maternal health literature (9). The lack of association with occupation suggests that employment status alone may not adequately capture socioeconomic influence in this largely informal economy setting.

Overall, these findings underscore a critical gap between awareness and effective dietary behaviour among pregnant women in the study area. However, several limitations should be considered. The cross-sectional design limits causal inference, and the

convenience sampling technique may reduce generalizability beyond the study facility. Self-reported dietary practices are also subject to recall and social desirability bias. Future research should employ longitudinal and mixed method designs to better understand behavioural drivers of maternal diet. Intervention studies testing structured, behaviour focused nutrition education within antenatal care are recommended. Practical, counselling and improving access to diverse, nutrient rich foods may help br/idge the persistent knowledge practice gap observed in this population

V. CONCLUSION

The study revealed that although awareness of good nutrition in pregnancy is high among pregnant women attending antenatal services at Ihiagwa Primary Health Centre, detailed knowledge and practical dietary implementation remain inadequate. Socio-demographic factors significantly influence nutritional knowledge and practice. There is a need to bridge the gap between awareness and dietary practices.

VI. RECOMMENDATIONS

Health care providers should integrate structured and practical nutrition education sessions should into routine antenatal care. Dietary diversity should be prioritize on including proteins, fruits, vegetables and other micronutrient-rich foods. Nutrition education to young and first-time mothers should be prioritized.

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