Original Research Article

Dietary Patterns and Anthropometric Status of Non-Pregnant Mothers at General Hospital Uromi, Edo State, Nigeria

Abbreviated title: Dietary Patterns and Anthropometry of Non-Pregnant Mothers in Uromi

ABSTRACT

Aim: This study assessed the dietary patterns, anthropometric status, and health behaviors of non-pregnant mothers attending General Hospital Uromi, Edo State, Nigeria.

Study Design: A cross-sectional design was employed in this study.

Place and Duration of Study: The study was carried out at the General Hospital Uromi, Edo State, Nigeria from June 2024 to January, 2025.

Methodology: The study involved 120 non-pregnant mothers aged 18–49 years. The participants were systematically selected using a random sampling technique from the hospital outpatient registry. Data were collected through structured, interviewer-administered questionnaires capturing sociodemographic information, dietary patterns, physical activity, and health behaviors. Anthropometric measurements, including weight, height, and waist circumference, were obtained using standardized procedures, and Body Mass Index (BMI) was calculated as weight (kg) divided by height squared (m^2). Ethical approval was obtained, and informed consent was provided by all participants. Data were analyzed using SPSS version 26, with descriptive statistics such as frequencies and percentages summarizing the findings. WHO criteria were applied for BMI classification, and waist circumference thresholds were used to identify central obesity risks.

Results: Participants were mostly aged 30–39 years (49.2%), married (65.8%), and self-employed (42.5%), with 67.5% earning ₦10,000–₦50,000 monthly. Dietary diversity was poor, with grains (29.2%) and proteins (25%) dominating diets, while fruits and vegetables were minimally consumed (8.3%). Breakfast skipping was common (25%), and sugary beverages were consumed 1–2 times weekly by 50% of respondents. Overweight and obesity prevalence were high, at 30.8% and 35%, respectively, with 40% having waist circumferences of 81–90 cm. Although 64.2% reported engaging in physical activity, only 4.2% exercised daily. Hypertension (2.5%) and diabetes (4.2%) were uncommon but posed future risks given the high obesity rates.

Conclusion: The findings underscore the urgent need for interventions to address poor dietary diversity, promote physical activity, and combat obesity. Nutrition education, improved access to healthy foods, and community-based programs are recommended to enhance maternal health and reduce the burden of NCDs in this vulnerable population.

Keywords: Dietary patterns, Anthropometric status, Non-pregnant mothers, Obesity, Overweight

INTRODUCTION

Comment [jn1]: The abstract is too lenghthy. It could be a bit concise.

Comment [jn2]: Only if you could a add a line about the gap in literature specific to the location

Maternal nutrition is a critical determinant of health outcomes for both mothers and their families. Non-pregnant mothers play an essential role in household nutrition as caregivers and decision-makers, making their dietary patterns and health behaviors pivotal for overall family well-being (1). However, the global shift towards energy-dense, nutrient-poor diets has exacerbated health challenges, particularly in low- and middle-income countries (LMICs) like Nigeria, where the double burden of malnutrition persists (2). While undernutrition remains a concern, the rising prevalence of overweight and obesity among women of reproductive age has introduced new public health challenges, including the increasing risk of non-communicable diseases (NCDs) such as diabetes and cardiovascular diseases (3,4).

The dietary habits of non-pregnant mothers are shaped by a complex interplay of sociodemographic, cultural, and environmental factors. Economic constraints, limited access to diverse foods, and low levels of nutrition education contribute to poor dietary diversity in many LMICs (5,6). Furthermore, cultural norms and rapid urbanization often influence food preferences, increasing the consumption of processed and unhealthy foods (7). A growing body of evidence indicates that the nutrition transition in these countries is fueling the obesity epidemic, which contributes significantly to NCDs (8,9).

Anthropometric measures such as Body Mass Index (BMI) and waist circumference are critical tools for assessing maternal health. High BMI and central obesity are strongly associated with metabolic syndrome and other chronic health conditions (10). Despite global recognition of these issues, limited studies have focused on the dietary and health behaviors of non-pregnant mothers in rural Nigerian settings. This study aims to fill this gap by examining the dietary patterns, anthropometric status, and health behaviors of non-pregnant mothers in Uromi, Edo State.

METHODOLOGY

Study Area

The study was conducted at the General Hospital Uromi, located in Uromi, Esan North-East Local Government Area of Edo State, Nigeria. Uromi is a semi-urban area predominantly inhabited by the Esan ethnic group. The hospital is a major healthcare facility providing medical services to the local population, including maternal and child health services. Its strategic location and diverse patient population made it suitable for assessing dietary patterns and anthropometric status among non-pregnant mothers.

Study Design

A cross-sectional descriptive design was employed to examine the dietary patterns, anthropometric status, and associated health behaviors of non-pregnant mothers attending the hospital. This design allowed for the collection of data at a single point in time to identify key characteristics and associations without inferring causality.

Study Population

The target population included non-pregnant mothers aged 18–49 years attending General Hospital Uromi for healthcare services. The study population comprised women visiting the hospital for routine check-ups, minor health concerns, or as caregivers for their children.

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Sample Size

The sample size was determined using the formula for a finite population:

$n = N/1 + N(e)^2$

Where:

n = required sample size

N = estimated population size (500)

e = margin of error (0.05)

The calculated sample size was 120 participants, adjusted by 10% for potential non-responses, resulting in a final sample size of 150.

Sampling Technique

A systematic random sampling method was used to select participants. A sampling frame was developed from the hospital's outpatient registry, and every third eligible mother was selected. If a selected participant declined or was unavailable, the next eligible individual on the list was approached.

Data Collection

Data were collected through two main approaches:

1. Questionnaire: A structured, interviewer-administered questionnaire was used to gather information on sociodemographics, dietary patterns, and health behaviors. Questions addressed meal frequency, food group consumption, and physical activity.

2. Anthropometric Measurements: Participants' height and weight were measured using a stadiometer and digital scale, respectively, while waist circumference was measured using a non-elastic measuring tape. Body Mass Index (BMI) was calculated as weight (kg) divided by height (m^2).

Ethical Considerations

Ethical approval was obtained from the relevant ethics committee, and informed consent was sought from all participants. They were assured of confidentiality, and participation was voluntary, with the option to withdraw at any time without consequences.

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Data Analysis

Data were coded and analyzed using SPSS (Statistical Package for the Social Sciences). Descriptive statistics, including frequencies and percentages, were used to summarize sociodemographic data, dietary patterns, and anthropometric measurements. Graphical presentations in tables, was employed to enhance data interpretation.

Comment [jn6]: The version used for SPSS should be mentioned.

RESULTS

Sociodemographic Information

The participants were predominantly aged 30–39 years (49.2%), married (65.8%), and self-employed (42.5%). The majority earned between ₦10,000 and ₦50,000 monthly (67.5%). Educational attainment showed that 40% had secondary education, while 35% had tertiary education. Most participants (83.3%) identified as Esan, reflecting the study area's ethnic composition.

Table 1: Sociodemographic Information

Age	Frequency	Percentage(%)
18-29	34	28.3%
30-39	59	49.2%
40-49	20	16.7%
50 and above	7	5.8%
Total	120	100%
Marital status	Frequency	Percentage(%)
Single	25	20.8%
Married	79	65.8%
Divorced	6	5%
Widowed	10	8.3%

Total	120	100%
Level of Education	Frequency	Percentage(%)
No formal education	7	5.8%
Primary education	23	19.2%
Secondary education	48	40%
Tertiary education	42	35%
Total	120	100%
Occupation	Frequency	Percentage(%)
Unemployed	15	12.5%
Self-employed	51	42.5%
Civil servant	36	30%
Private sector employee	18	15%
Total	120	100%
Household Monthly Income	Frequency	Percentage(%)
Less than #10,000	27	22.5%
#10,000 - #50,000	81	67.5%
#50,000 - #100,000	8	6.7%
Above #100,000	4	3.3%
Total	120	100%
Number of Children	Frequency	Percentage (%)
1 child	18	15%
2-3 children	47	39.2%
4-5 children	27	22.5%
More than 5 children	2	1.7%

None	**26**	**21.7%**
Total	**120**	**100%**
Ethnicity	**Frequency**	**Percentage(%)**
Esan	**100**	**83.3%**
Yoruba	**8**	**6.7%**
Igbo	**10**	**8.3%**
Hausa	**0**	**0%**
Others	**2**	**1.7%**
Total	**120**	**100%**

Dietary Patterns

The majority of participants consumed three meals daily (65.8%). However, dietary diversity was poor: grains (29.2%) and proteins (25%) were the most consumed food groups, while fruits and vegetables were rarely included in daily diets (8.3% each). Breakfast was the most commonly skipped meal (25%), while 50% consumed sugary beverages 1–2 times per week. Alcohol consumption was minimal, with 80.8% reporting complete abstinence. The results are shown in Table 2.

Table 2: Dietary Patterns

How many meals do you eat in a day	Frequency	Percentage(%)
One meal	0	0%
Two meals	19	15.8%
Three meals	79	65.8%
More than three meals	22	18.3%
Total	120	100%
Do you include the following food groups in your daily diet	Frequency	Percentage(%)
Grains	35	29.2%
Vegetables	10	8.3%
Fruits	10	8.3%

Proteins	30	25%
Dairy products	5	4.2%
Fats and oils	15	12.5%
Sugary foods	15	12.5%
Total	120	100%
How often do you consume fruits	Frequency	Percentage(%)
Daily	4	3.3%
3-5 times a week	40	33.3%
1-2 times a week	62	51.7%
Rarely	14	11.7%
Never	0	0%
Total	120	100%
How often do you consume vegetables	Frequency	Percentage(%)
Daily	5	4.2%
3-5 times a week	30	25%
1-2 times a week	60	50%
Rarely	25	20.8%
Never	0	0%
Total	120	100%
How often do you consume fast food or processed food	Frequency	Percentage(%)
Daily	1	0.8%
3-5 times a week	8	6.7%
1-2 times a week	51	42.5%
Rarely	58	48.3%

Never	2	1.7%
Total	120	100%
Do you skip any of the following meals regularly	Frequency	Percentage(%)
Breakfast	30	25%
Lunch	24	20%
Dinner	3	2.5%
None	63	52.5%
Total	120	100%
How often do you drink sugary beverages	Frequency	Percentage(%)
Daily	2	1.7%
3-5 times a week	7	5.8%
1-2 times a week	60	50%
Rarely	47	39.2%
Never	4	3.3%
Total	120	100%
How often do you consume alcohol	Frequency	Percentage(%)
Never	97	80.8%
Occasionally	23	19.2%
Weekly	0	0%
Daily	0	0%
Total	120	100%

Anthropometric Measurements

Anthropometric assessments revealed high prevalence rates of overweight (30.8%) and obesity (35%), with only 23.3% of participants falling within the normal BMI range. Central obesity was prevalent, with 40% of participants having waist circumferences between 81–90 cm. This indicated a significant risk of metabolic complications (Table 3).

Table 3: Anthropometric Measurements

What is your BMI	Frequency	Percentage(%)
Underweight: BMI <18.5	1	0.8%
Normal weight: BMI 18.5 - 24.9	28	23.3%
Overweight: BMI 25 - 29.9	37	30.8%
Obesity(class 1): BMI 30 - 34.9	42	35%
Obesity(class 2): BMI 35 - 39.9	12	10%
Obesity(class 3): BMI ≥ 40	0	0%
Total	120	100%
What is your waist circumference	Frequency	Percentage(%)

60 - 70cm	**12**	**10%**
71 - 80cm	**40**	**33.3%**
81 - 90cm	**48**	**40%**
91 - 100cm	**16**	**13.3%**
101 - 110cm	**4**	**3.3%**
Total	**120**	**100%**

Health and Physical Activity

Regarding physical activity, 64.2% of participants reported engaging in regular physical activity, but only 4.2% exercised daily. Chronic conditions such as hypertension (2.5%) and diabetes (4.2%) were relatively uncommon, though the high rates of obesity suggest potential long-term health risks. Additionally, 53.3% of participants had received nutrition counseling, yet gaps between knowledge and practice persisted, as reflected in the poor dietary diversity. The detail is shown in Table 4.

Table 4: Health and Physical Activity

Do you engage in regular physical activity or exercise	Frequency	Percentage(%)
Yes	77	64.2%
No	43	35.8%
Total	120	100%
If yes, how often do you exercise	Frequency	Percentage(%)
Daily	5	4.2%
3-5 times a week	10	8.3%
1-2 times a week	37	30.8%
Rarely	25	20.8%

None	43	35.8%
Total	120	100%
Do you have any existing medical conditions	Frequency	Percentage(%)
Hypertension	3	2.5%
Diabetes	5	4.2%
Heart disease	1	0.8%
Others	3	2.5%
None	108	90%
Total	120	100%
Are you currently taking any medication for weight management or any other chronic condition	Frequency	Percentage(%)
Yes	8	6.7%
No	112	93.3%
Total	120	100%
Have you received any nutrition counselling or dietary advice from a healthcare professional in the past year	Frequency	Percentage(%)
Yes	64	53.3%
No	56	46.7%
Total	120	100%

DISCUSSION OF RESULTS

The findings revealed that most participants were aged 30–39 years (49.2%), married (65.8%), and self-employed (42.5%). These results align with previous studies, which indicate that middle-aged women in LMICs are often engaged in self-employment due to economic constraints and limited formal job opportunities (11,12). The high prevalence of low-income earners (67.5%) highlights economic barriers that restrict access to diverse, nutritious foods (13).

Despite most participants consuming three meals daily (65.8%), dietary diversity was poor, with grains (29.2%) and proteins (25%) dominating diets, while fruits and vegetables were underrepresented (8.3%). This aligns with findings by Nwaokoro et al. (2022), who reported similar trends of limited fruit and vegetable consumption in Nigeria, often due to affordability and accessibility issues (6). The observed breakfast skipping rate of 25% mirrors global trends, where breakfast omission is linked to poor energy

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regulation and increased obesity risks (14). The moderate consumption of sugary beverages (50% consuming 1–2 times weekly) poses significant health risks, as frequent intake of these drinks is associated with weight gain and metabolic disorders (15).

Anthropometric data showed high rates of overweight (30.8%) and obesity (35%), with only 23.3% of participants having a normal BMI. These findings are consistent with studies by Adeloye et al. (2021), who reported rising obesity rates among Nigerian women, attributed to urbanization, dietary transitions, and physical inactivity (16). Central obesity was also prevalent, with 40% of participants having waist circumferences between 81–90 cm, indicating moderate metabolic risks. Central obesity, a stronger predictor of metabolic syndrome than BMI alone, increases the risk of cardiovascular diseases and type 2 diabetes (10,17).

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Although 64.2% of participants reported engaging in regular physical activity, only 4.2% exercised daily. This low level of consistent physical activity reflects findings by Bigman et al. (2022), who identified physical inactivity as a growing concern in Nigeria, especially among women (18). The high prevalence of overweight and obesity in this study suggests that the reported physical activity levels may be insufficient to offset caloric intake (19).

The prevalence of hypertension (2.5%) and diabetes (4.2%) was relatively low; however, these conditions are likely to increase over time due to the high rates of obesity. Studies have established that obesity significantly elevates the risk of NCDs, including hypertension and diabetes, especially in LMICs undergoing nutrition transitions (20,21).

While the study provides valuable insights, several limitations must be acknowledged. First, the reliance on self-reported dietary patterns and physical activity levels may introduce reporting bias. Participants may have underreported unhealthy behaviors or overestimated physical activity. Second, the cross-sectional design limits the ability to establish causal relationships between dietary patterns, physical

activity, and anthropometric outcomes. Longitudinal studies are needed to better understand these dynamics (22).

Additionally, the study's focus on a single hospital in Uromi limits the generalizability of findings to other regions with differing sociodemographic and cultural contexts. Future research should include a larger, more diverse sample to enhance representativeness (23). Finally, while the study highlights poor dietary diversity, it does not assess micronutrient deficiencies, which are critical for understanding the broader implications of maternal nutrition (24).

CONCLUSION

The study revealed significant nutritional and health challenges among non-pregnant mothers in Uromi, including poor dietary diversity, high prevalence of overweight (30.8%) and obesity (35%), and limited physical activity. Central obesity, a key metabolic risk factor, was prevalent among participants. Sociodemographic factors, such as low income and moderate education levels, influenced poor dietary practices. Despite receiving nutrition counseling, participants demonstrated limited adoption of healthier dietary behaviors, underscoring the need for more practical and targeted interventions.

If left unaddressed, these trends may lead to an increase in non-communicable diseases such as hypertension and diabetes, emphasizing the urgent need for public health strategies to promote better nutrition and active lifestyles.

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