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Research

# Nutritional knowledge and practices among residents in Kano Metropolis, Nigeria

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## Abstract

Poor nutrition knowledge and unhealthy dietary practices contribute to the rising burden of non-communicable diseases in many low- and middle-income countries, including Nigeria. This study aimed to assess the nutritional knowledge and practices of residents in Kano Metropolis, a rapidly urbanizing region in northern Nigeria. A descriptive cross-sectional study was conducted among 420 participants (186 males, 234 females), aged 15–70 years. A validated FAO-UN questionnaire was used to collect data on socio-demographic variables and nutrition-related knowledge and practices. Data were analyzed using STATA v24.0, employing Chi-square tests to assess associations. Female participants exhibited higher levels of nutritional knowledge and healthier dietary practices than males ($p < 0.05$). This may be attributed to education exposure, particularly nutrition-related subjects in secondary schools. Participants had good awareness of balanced diets, but knowledge gaps existed in nutritional risks and harmful food choices. Most participants stated that they often did not plan for a balanced diet, often did not consume high-fiber foods, and did not exercise regularly. Women more often stated they ate nutrient dense and high protein foods and men more often used nutritional supplements. These results underscore the need for widespread nutrition education programs and the integration of nutrition curricula in schools.

## INTRODUCTION

Nutrition is a fundamental determinant of health, influencing human growth, cognitive development, and disease prevention (WHO, 2024). Non-communicable diseases (NCDs) such as diabetes, hypertension and obesity are increasingly prevalent in low- and middle-income countries (LMICs), partly due to poor nutrition knowledge and dietary behaviors (Perez-Escamilla et al. 2018). A basic human right is to be free from hunger and malnutrition, and reducing this condition is essential to both individual and societal advancement (FAO, 2024).

Nutrition Education includes any combination of educational techniques and environmental supports intended to promote the voluntary adoption of healthy eating habits (SNEB, 2024). It is provided in a variety of settings and encompasses activities at the individual, community and policy levels (SNEB, 2024).

The double burden of malnutrition is best illustrated by the situation of malnutrition in sub- Saharan Africa, where the prevalence of undernutrition and obesity are rising. Both conditions contribute to diet related disease (Giancola et. al. 2022). Africa also accounted for 24% of the world's overweight children under five in 2016, with rates rising among young women and adolescents (FAO, 2022).

With 25% of its population undernourished, Sub-Saharan Africa has the highest rate of hunger in the world (WFP, 2016). Dietary consumption influences nutritional status, which is linked to nutritional knowledge (Spronk et al. 2014). Only 25% of respondents had strong nutritional awareness, according to earlier research conducted in sub-Saharan Africa (Akinyinka et al. 2016). Furthermore, the fast urbanization and economic expansion in developing nations are constantly influencing eating practices. Poor nutritional status results from these dietary changes, which include a move toward foods higher in calorie density, a higher intake of saturated fat, and a lower intake of complex carbohydrates, dietary fiber, fruits, and vegetables (WHO/FAO, 2020).

In Nigeria, urbanization has led to shifts in dietary patterns, with increased consumption of processed foods, sugary beverages and high-fat diets (Olatona et al. 2023;

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FAO, 2024). Kano Metropolis, a major urban hub in northern Nigeria, faces unique nutritional challenges, with disparities in dietary habits, food accessibility, and health awareness (Gadanya et al. 2021).

Studies of nutritional knowledge and practices in Nigeria include one on students in secondary schools in the metropolis of Sokoto (Essien et al. 2014) and another in Lagos which explored the relationship of nutritional knowledge and dietary habits (Olatona et al. 2023). Gadanya et al. (2021) assessed the nutritional knowledge and practices of girl secondary school students in Kano State, but did not explore this in Kano State adults. The present study aims to assess the nutritional knowledge and practices among residents of Kano Metropolis, identifying gender-based differences in nutritional awareness.

## METHODS

### *STUDY AREA AND POPULATION*

This was a descriptive cross-sectional study conducted among 420 adults (5–70 years) residing in Kano Metropolis. Probability sampling was used to select participants from eight urban local government areas of Kano Metropolis. Adults aged 15+ years who provided written informed consent were included who were free from severe illnesses.

### *SAMPLING METHOD*

Stratified random sampling was conducted. All 8 local government areas (LGAs) in Kano Metropolis were included (Fagge, Gwale, Kano municipal, Nassarawa, Dala, Tarauni, Kumbotso). Then the following sampling stages were followed:

1. (Selection of wards) in each of the LGAs, a list of all political wards was drawn and then using balloting 1 ward was randomly selected.
2. (Selection of settlements). Three Settlement out of all the settlements in the wards were randomly selected.
3. (Selection of streets within the settlements). Of all streets in each ward, two were randomly selected using balloting.
4. All the houses in all these two streets were numbered. A register of all the households in each street was developed and used as the sampling frame. A systematic sampling technique was used to select the households for the study.
5. Any eligible respondents within the selected households were identified and interviewed.

### *DATA COLLECTION*

A validated FAO-UN questionnaire was administered via structured face-to-face interviews by the five research assistants from May 2024- September 2024. Variables Measured included nutrition-related knowledge (awareness of food groups, balanced diets, dietary risks) and practices (frequency of consuming specific food groups, exercise habits).

### *STATISTICAL ANALYSIS*

Data were analyzed using STATA v24.0. The tests applied included descriptive statistics to summarize demographic data and chi-square tests to assess associations between KAP variables and gender. Confidence intervals (95% CI) were reported for key findings.

### *ETHICAL APPROVAL*

The study was approved by Health Research Ethics Committee, Kano State Ministry of Health. All participants signed informed consent forms after being briefed on the study objectives, risks, and confidentiality measures.

## RESULTS

The socio-demographic characteristics of the study participants are presented in Table 1 by gender.

**Table 1. Socio-demographic characteristics of Kano metropolis residents based on gender**

| Socio-Demographic Characteristics | Categories | Female n (%) | Male n (%) | CHI²/ Fisher's Exact | P-Value |
|---|---|---|---|---|---|
| **Age** | 1-24 years | 120(51.3) | 45(24.2) | 43.367 | 0.000 |
| | 25-34 years | 96(41.0) | 105(56.5) | | |
| | 35-44 years | 6 (2.6) | 27(14.5) | | |
| | 45 and above | 12(5.1) | 9(4.8) | | |
| **Marital Status** | Single | 144(61.5) | 123(66.1) | - | 0.330 |
| | Married | 81(34.6) | 60(32.3) | | |
| | Divorced | 9(3.8) | 3(1.6) | | |
| **Educational Status** | Secondary | 24(10.3) | 18(9.7) | 0.039 | 0.844 |
| | Tertiary | 210(89.7) | 168(90.3) | | |
| **Occupational Status** | Civil servant | 72(30.8) | 69(37.1) | 23.581 | 0.000 |
| | Not employed | 21(9.0) | 9(4.8) | | |
| | Self employed | 39(16.7) | 60(32.3) | | |
| | Student | 102(43.6) | 48(25.8) | | |
| **Monthly Income** | < 50,000 | 159(68.0) | 87(46.8) | 30.073 | 0.000 |
| | 50,000-100,000 | 42(17.9) | 45(24.2) | | |
| | 100,001-150,000 | 15(6.4) | 42(22.6) | | |
| | >150,000 | 18(7.7) | 12(6.5) | | |
| **Number of Children** | 0 | 153(65.4) | 117(63.0) | - | 0.055 |
| | 1-4 | 72(30.8) | 51(27.4) | | |
| | 5-8 | 9(3.8) | 15(8.1) | | |
| | 9 and above | 0(0) | 3(1.6) | | |

Table 2 provides information on participants' nutrition knowledge, again compared by gender. 75% recognized the importance of nutrition, but only 40% understood the risks of unhealthy diets. Women were generally more aware of nutrition, adequate meals, vital nutrients, overfeeding dangers, overweight risks, and foods for growth ($p < 0.05$). There were no significant gender differences in weight-control strategies or awareness of harmful foods. However, women reported more problems relating to appetite.

Table 3 presents data on participants' nutrition-relevant practices.75% ate protein-rich foods regularly, but only 30% planned balanced meals consistently. Physical activity was more common among men ($p < 0.05$). Consumption of fiber-rich foods was not high but there was no difference by gender ($p > 0.05$).

**Table 2. Nutritional knowledge of Kano metropolis residents**

| S/N | Questions | Options | Female | Male | CHI²/ Fisher's Exact | P-Value |
|---|---|---|---|---|---|---|
| 1. | Are you aware about the importance of Nutrition? | yes | 225 | 171 | - | 0.008 |
| | | no | 3 | 0 | | |
| | | maybe | 6 | 15 | | |
| 2. | Are you aware of consumption of adequate diet? | yes | 228 | 171 | - | 0.000 |
| | | no | 6 | 3 | | |
| | | maybe | 0 | 12 | | |
| 3. | Are you aware of the main food nutrients that you should consume daily (balanced diet); i.e. proteins, carbohydrates, fats, minerals and vitamins? | yes | 228 | 168 | - | 0.005 |
| | | no | 3 | 6 | | |
| | | maybe | 3 | 12 | | |
| 4. | Are you aware of the sources of main food groups that you should eat 3 main meals a day? | yes | 204 | 150 | 4.814 | 0.090 |
| | | no | 24 | 24 | | |
| | | maybe | 6 | 12 | | |
| 5. | Are you aware about the risk of overfeeding? | yes | 207 | 159 | - | 0.002 |
| | | no | 27 | 18 | | |
| | | maybe | 0 | 9 | | |
| 6. | Are you aware of potentially harmful foods? | yes | 177 | 150 | 1.951 | 0.377 |
| | | no | 39 | 27 | | |
| | | maybe | 18 | 9 | | |
| 7. | Are you aware of the risk of overweight? | yes | 207 | 162 | - | 0.039 |
| | | no | 15 | 21 | | |
| | | maybe | 12 | 3 | | |
| 8. | Are you aware of the foods for growth and development? | yes | 225 | 162 | - | 0.002 |
| | | no | 6 | 12 | | |
| | | maybe | 3 | 12 | | |
| 9. | Are you aware that the best source of information for nutrition is in the hospital? | yes | 159 | 114 | 5.826 | 0.054 |
| | | no | 45 | 54 | | |
| | | maybe | 30 | 18 | | |
| 10. | Do you have any problems with your appetite, like not feeling hungry or feeling hungry all the time? | yes | 90 | 60 | 6.601 | 0.037 |
| | | no | 135 | 108 | | |
| | | maybe | 9 | 18 | | |
| 11. | Have you tried to lose weight or control your weight by vomiting, taking a diet, pills or laxatives, or not eating? | yes | 69 | 60 | 0.602 | 0.740 |
| | | no | 159 | 120 | | |
| | | maybe | 6 | 6 | | |

**Table 3. Nutrition-related practices of Kano metropolis residents**

| S/N | Questions | Options | Female | Male | CHI²/ Fisher's Exact | P-Value |
|---|---|---|---|---|---|---|
| 1. | How often do you eat food substances that contain carbohydrate like starchy foods? | Always | 117 | 90 | - | 0.469 |
| | | Often | 54 | 51 | | |
| | | Sometimes | 51 | 33 | | |
| | | Rarely | 6 | 9 | | |
| | | Never | 6 | 3 | | |
| 2. | How often do you eat bodybuilding foods like milk, egg, or beans | Always | 102 | 51 | - | 0.000 |
| | | Often | 72 | 63 | | |
| | | Sometimes | 60 | 60 | | |
| | | Rarely | 0 | 9 | | |
| | | Never | 0 | 3 | | |
| 3. | How often do you eat fats and oil food substance from plant source? | Always | 51 | 51 | - | 0.089 |
| | | Often | 84 | 54 | | |
| | | Sometimes | 84 | 60 | | |
| | | Rarely | 12 | 12 | | |
| | | Never | 3 | 9 | | |
| 4. | How often do you eat food substances that are rich in vitamins like fruits, vegetables, fortified milk, fortified margarine, eggs, liver and fish? | Always | 69 | 48 | - | 0.001 |
| | | Often | 69 | 63 | | |
| | | Sometimes | 96 | 63 | | |
| | | Rarely | 0 | 9 | | |
| | | Never | 0 | 3 | | |
| 5. | How often do you drink eight and more glasses of fluids daily? | Always | 99 | 81 | - | 0.073 |
| | | Often | 48 | 39 | | |

***Table 3. Continued***

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Sometimes | 72 | 51 | | |
| | | Rarely | 9 | 15 | | |
| | | Never | 6 | 0 | | |
| 6. | How often do you plan and keep to a balance food menu? | Always | 60 | 45 | 4.384 | 0.357 |
| | | Often | 51 | 33 | | |
| | | Sometimes | 78 | 57 | | |
| | | Rarely | 30 | 36 | | |
| | | Never | 15 | 15 | | |
| 7. | How often do you eat food substances rich in fiber/roughages like skin of fruits, wheat and grain? | Always | 27 | 27 | - | 0.200 |
| | | Often | 84 | 63 | | |
| | | Sometimes | 114 | 81 | | |
| | | Rarely | 9 | 15 | | |
| | | Never | 0 | 0 | | |
| 8. | How often do you eat fried foods and other fattening foods or high calorie foods some of which are animal fats, butter and starchy foods? | Always | 18 | 18 | - | 0.185 |
| | | Often | 54 | 48 | | |
| | | Sometimes | 132 | 105 | | |
| | | Rarely | 24 | 15 | | |
| | | Never | 6 | 0 | | |
| 9. | How often do you exercise? | Always | 60 | 57 | - | 0.000 |
| | | Often | 24 | 45 | | |
| | | Sometimes | 114 | 69 | | |
| | | Rarely | 36 | 12 | | |
| | | Never | 0 | 3 | | |
| 10. | How often do you take vitamins and mineral supplements? | Always | 15 | 42 | 51.734 | 0.000 |
| | | Often | 39 | 27 | | |
| | | Sometimes | 93 | 72 | | |
| | | Rarely | 33 | 39 | | |
| | | Never | 54 | 6 | | |

## DISCUSSION

Participants in our study, adults in Kano, Nigeria, had good nutritional knowledge and reasonable consumption of a balance diet. This may be attributed to their relatively high level of education. This result is similar to that found in western Nigeria among the civil servants (Akinmoladun et al. 2021). However, poor nutritional knowledge was found among adults in urban Lagos State (Olatona et al. 2023) as did mothers in south-west Nigeria where only 19.5% had good knowledge (Akinyinka et al. 2016).

Women in our sample had better nutritional knowledge ($p<0.005$). This aligns with Akinmoladun et al. (2021) in western Nigeria, where females exhibited greater nutritional awareness. Nutritional knowledge was found to be linked to dietary habits and nutritional status, at least among the elderly (*J*eruszka -Brekak et al. 2020). Knowledge of proper nutrition is essential as the first stage in changing the dietary patterns and practices (Olatona et al. 2023).

Participants had relatively good dietary practices among those we measured. This too may be attributed to their educational background, as well as their high level of knowledge and the settings of the study population. The main gender differences were women more often consuming nutrient dense and protein-rich foods, and men more often taking nutritional supplements. Both were often did not consume high-fiber foods or get exercise.

These results should be interpreted with caution because self-reported data may introduce recall bias. In addition, the lack of dietary intake verification may have restricted the accuracy of our findings.

## CONCLUSION

This study highlights moderately positive nutritional knowledge and practices of Kano Metropolis adults, with females exhibiting higher awareness than their male counterparts. Findings highlight the need for integrated nutrition education programs targeting all demographic groups. Gender-based nutritional education programs should be developed to address gaps identified here. Government policies promoting healthier food choices in urban areas should be increased. Future studies should incorporate dietary assessments to validate self-reported data.

## AUTHOR CONTRIBUTIONS

NSS was involved in the conception, project administration, supervision, writing original draft and resources. AMU was involved in data curation, investigation, methodology, validation and writing (review & editing). SA was also involved in formal analysis, software, visualization. All the authors gave approval for the publication of the final version.

## CONFLICT OF INTEREST

The authors declare that they have no other potential conflicts of interest.

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