Assessment of Food Group Knowledge and Dietary Practices of Young Adolescents (12 to 15 years) in Lagos State, Nigeria

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Abstract: Adequate nutrition during adolescence is necessary for optimal growth and development. However, studies in Nigeria show gaps between food group knowledge and dietary practices among adolescence linked to detrimental health consequences. This study examined food group knowledge and dietary practices of young adolescents (12 to 15 years) in Educational District II, Lagos State. A cross-sectional survey of 200 respondents (12 to 15 years) in government owned junior secondary schools (JSS1–JSS3) were evaluated using a structured questionnaire. The information gathered were analyzed using descriptive statistics, such as frequency counts, means, and percentages, as well as inferential statistics to test the formulated hypotheses. Findings from the study revealed an average mean score of 2.93 to 3.12, indicating a generally good knowledge of food group among the respondents. A significant portion of students consumed sugary snacks or fast food frequently, with 75% agreeing to consuming excessive sugary intake. Only 26.7% strongly agreed to eating fruits and vegetables daily, which falls short of recommended guidelines.

The majority reported drinking sufficient water and regular breakfast intake, indicating partial alignment with good dietary practices. The mean scores for most items hovered between 2.88 and 3.11, suggesting moderate adherence to healthy eating patterns, though areas like fruit/vegetable consumption and adequate meals require improvement. The students linked their knowledge of food groups to better food choices, as reflected in mean scores above 3.00 for most items. A significant difference exists in the students' knowledge of food groups ($X^2 > 0.05$). There was a significant relationship between students' knowledge of food groups and dietary choices ($X^2 > 0.05$). The study highlighted the need for concerted efforts to bridge the gap between knowledge and practice to promote healthier eating habits among adolescents. Nutrition education should be made a core part of the secondary school curriculum, especially in junior and senior secondary levels, to help students internalize proper dietary practices from a young age.

Keywords: *Food Group, Knowledge, Dietary Practices, Education District II, Young Adolescents.*

I. INTRODUCTION

Nutrition is a fundamental aspect of human health, influencing growth, cognitive development, and overall well-being. Among young adolescents within the age group of 12 to 15 years old, proper nutrition is particularly crucial due to the rapid physical, emotional and cognitive changes that occur during this stage of development (WHO, 2022). One of the key factors that determine an individual's ability to make healthy food choices is food group knowledge which is the understanding of different food classifications, their nutritional value, and their role in the human body (FAO, 2021). Adequate knowledge of food groups enables individuals to make informed dietary decisions that promote healthy living and prevent nutrition related health conditions. However, studies have shown that many young adolescents within the age group of 12 to 15 years old, particularly in developing countries, lack sufficient knowledge of food groups, leading to poor dietary

practices, unhealthy eating patterns and an increased risk of malnutrition (Ajayi & Akinola, 2021).

In Nigeria, dietary practices among young adolescents within the age group of 12 to 15 years old are influenced by various factors, including cultural beliefs, socio-economic status, food availability and nutrition education (Kolawole & Eze, 2022). While some students are exposed to proper nutrition education at home and in school, others rely on misinformation, peer influence, and media advertising when making food choices. The increasing consumption of processed foods, sugary beverages and fast food has raised concerns about the long-term health effects of poor nutrition among Nigerian schoolchildren (Adepoju & Adejare, 2020). The consequences of unhealthy dietary practices include micronutrient deficiencies, obesity, stunted growth, reduced cognitive function and an increased risk of chronic diseases such as diabetes and hypertension (UNICEF, 2022). These health complications not only affect students' physical well-being but also impact their academic performance, concentration levels, and overall quality of life (Shapu, Okafor, & Bello, 2022)

The concept of food group knowledge is fundamental to improving dietary practices among young adolescents within the age group of 12 to 15 years old. Food groups typically include carbohydrates, proteins, fats, vitamins, minerals, and dairy products, all of which serve unique functions in maintaining proper health (WHO, 2021). An adequate diet ensures that individuals receive adequate nutrients for growth, immunity, energy production and cognitive function. However, research has shown that many young adolescents within the age group of 12 to 15 years old lack proper knowledge of food groups, which affects their ability to make healthy dietary choices (Oguntona & Akinyele, 2019). Dietary practices refer to the eating habits, meal patterns and food preferences of individuals or groups. These practices are shaped by a combination of personal preferences, cultural norms, economic status and food accessibility (WHO, 2022). In Nigeria, young adolescents within the age group of 12 to 15 years old' dietary habits have shifted in recent years, with an increasing preference for fast food, carbonated drinks, and high-calorie snacks over traditional, home-cooked meals (FAO, 2021). This shift can be attributed to factors such as urbanization, globalization, and exposure to Western eating patterns (UNICEF, 2022). Research has shown that many secondary school students in Nigeria consume diets that are high in carbohydrates but low in essential vitamins, minerals, and proteins, which can lead to malnutrition and poor health outcomes (Alabi & Odunayo, 2019). In addition, many students skip breakfast, consume irregular meals, or rely on street food vendors, which often sell food that lacks nutritional value (Kolawole & Eze, 2022).

In many Nigerian schools, nutrition education is either inadequate, outdated, or poorly implemented, leading to limited awareness of healthy eating practices (FAO, 2021). Furthermore, socio-economic factors such as poverty and food insecurity play a significant role in shaping students' dietary habits, as families with lower income levels often struggle to afford nutritious meals (Ajayi & Akinola, 2021). In recent years, several interventions have been introduced to address nutrition-related challenges among school-aged children in Nigeria. Government initiatives such as the National Home-Grown School Feeding Program (NHGSFP) aim to provide nutritionally balanced meals to students in public schools (FAO, 2021). However, the effectiveness and sustainability of such programs remain a subject of debate, as many schools face inconsistencies in meal supply, poor food quality, and lack of adequate monitoring (UNICEF, 2022).

Given the growing concerns about malnutrition, unhealthy eating habits, and diet-related diseases among Nigerian young adolescents within the age group of 12 to 15 years old, this study is both timely and necessary. By evaluating food group knowledge and dietary practices among among the study population, this research contributes to ongoing efforts to improve nutrition education, promote healthy eating habits, and enhance the overall well-being of students. The findings serve as a basis for policy recommendations that can help shape future nutrition programs and interventions in Nigerian schools.

➢ *Statement of the Problem*

In Educational District of Lagos State, students come from diverse socio-economic backgrounds, which may influence their level of food group knowledge and dietary choices. While some students have access to well-balanced meals at home and in school, others may rely on affordable but nutritionally inadequate food options. The presence of unhealthy food vendors around schools further exacerbates the problem, as many students prefer fast food and sugary snacks over home-prepared meals due to convenience and peer influence (Ogunlade et al., 2022). The extent to which students' knowledge of food groups affects their dietary choices remains unclear, necessitating an investigation into whether knowledge of food groups results in improved eating habits or if other factors, such as economic status, taste preferences and parental influence, play a more significant role.

➢ *Research Questions*

The following research questions guided the study:

- What is the food group knowledge of young adolescents within the age group of 12 to 15 years old in Educational District II, Lagos State?
- What are the common dietary practices among these students, and do they conform with recommended nutritional guidelines?
- Is there a significant relationship between food group knowledge and students' dietary choices?

➤ *Research Hypotheses*

The following null hypotheses were formulated and tested at 0.05 level of significance:

- Ho^1: There is no significant difference in the food group knowledge of young adolescents within the age group of 12 to 15 years old in Educational District II of Lagos State.
- Ho^2: There is no significant relationship between students' knowledge of food group and their dietary choices.

II. METHODOLOGY

➤ *Research Design*

The study employed a descriptive cross-sectional survey design.

➤ *Area of the Study*

The study was conducted in Educational District II, Lagos State. It is one of the six education districts in Lagos State. The district covers three local government areas: Agege, Alimosho, and Ifako-Ijaye. Lagos State is situated in the Southwestern region of Nigeria and is one of the country's most urbanized and populous states. Educational District II was selected due to its socio-cultural and demographic diversity, which includes students from a range of socio-economic backgrounds. The district represents a blend of urban and semi-urban lifestyles and its food environment is influenced by local food vendors, school canteens, home- packed meals and informal food markets, all of which can shape adolescents' dietary practices.

➤ *Population of the Study*

The population of this study is 46,208 (Lagos Eko Project, 2022). This comprised all students enrolled in government owned junior secondary schools (JSS1–JSS3) in Educational District II.

➤ *Sample and Sampling Technique*

The sample size for this study is 387. This was determined using Morgan Table for determining sample size. Multi-stage sampling technique was adopted for this study to ensure both representativeness and inclusiveness of all regions within the district. There are 51 junior secondary schools in Education District II (Lagos Eko Project, 2022). In the first stage, the three local governments were selected to participate in the study. At

stage two, three junior secondary schools were selected through systematic sampling from each of the three local government areas in the district. At stage three, the students were stratified within each school based on their class level (JSS1, JSS2, and JSS3) and gender. This stratification was important to achieve a balanced distribution across academic levels and between male and female students, thereby enhancing the internal validity of the study. At stage four, eleven students within the age range of 12 to 15 were purposefully selected from JSS 1, 2 and 3 from each of the nine schools that participated in the study making a total of 387 students. This age range was selected because it represents the critical developmental stage of early adolescence when food habits begin to solidify and nutritional needs are particularly high. The focus on students within formal school settings ensures access to a controlled group where uniform educational influence exists and where nutrition-based interventions are most likely to have a long-term impact.

➤ *Research Instrument*

The study employed a structured questionnaire to gather relevant data. These tools were carefully designed to collect both quantitative and qualitative data that would provide insight into students' knowledge and practices related to food and nutrition.

➤ *Method of Data Collection*

Prior to administration, ethical clearance was obtained from relevant authorities, and permission was secured from each school's management. Parental consent and student assent were also obtained where applicable. The questionnaires were administered physically in classrooms with the help of teachers in the schools. The researchers provided brief instructions and clarified items, when necessary, especially for terms that may be unfamiliar to some students. Students completed the questionnaire under supervision to ensure completeness and accuracy.

III. RESULTS

➤ *Research Question 1*

What is the food group knowledge of young adolescents within the age group of 12 to 15 years old in Educational District II, Lagos State?

Table 1: Food Group Knowledge among Adolescents Students Aged 12-15 (N=180)

S/N	Food Knowledge Items	SA	A	D	SD	X	SDV
1	The major food groups are carbohydrate Proteins, fats, vitamins, minerals and water	66 (36.7%)	75 (41.7%)	24 (13.3%)	15	3.07	0.92
2	I can mention at least one food item under each food group	72 (40%)	69 (38.3%)	24 (13.3%)	15 (8.3%)	3.10	0.91
3	I am aware that proteins are body building and tissue repairers	60 (33.3%)	78 (43.3%)	27 (15%)	15 (8.3%)	3.02	0.93
4	Examples of protective foods are fruits and vegetables	57 (31.7%)	90 (50%)	21 (11.7%)	12 (6.7%)	3.07	0.84
5	Carbohydrates provides energy	63 (35%)	84 (45%)	21 (11.7%)	12 (6.7%)	3.10	0.86

| 6 | Water aids digestion | 66 (36.7%) | 81 (45%) | 21 (11.7%) | 12 (6.7%) | 3.12 | 0.84 |
| 7 | I am confident in my knowledge of adequate diet and meal planning | 48 (26.7%) | 84 (46.7%) | 36 (20%) | 12 (6.7%) | 2.93 | 0.91 |

Majority of the respondents claimed to having knowledge of food groups and their functions. Over 77% could identify food items under each group, and over 78% knew the importance of water. However, fewer students (26.7%) strongly agreed to being confident about meal planning and adequate diet, showing a gap in practical application despite theoretical knowledge. The average mean score across all items ranged from 2.93 to 3.12, indicating a generally good knowledge of food group among the respondents. This revealed that the majority of the respondents exhibited moderate to high knowledge of food groups, indicating a relatively good knowledge of basic nutritional concepts. This is consistent with the study by Ajani and Adefeso (2018), who reported that urban adolescents in Nigerian secondary schools demonstrated substantial awareness of nutrition principles. Similarly, Adeyemi, Ojo, & Ibrahim (2023) found that participation in school nutrition education programs significantly improved students' knowledge of food groups in Southwestern Nigeria. The current result supports these findings and suggests that nutrition curricula in these schools are effective in imparting essential knowledge of good groups among students. Additionally, Adejumo et al. (2019) emphasized the importance of school-based interventions in enhancing students' understanding of adequate diets, which aligns with the present findings. The authors suggested that such knowledge is pivotal for promoting healthier dietary behaviors among adolescents. The results also corroborate international research such as that by Lien, Lytle, & Klepp (2020), who found that adolescents attending schools with integrated nutrition education had higher food group knowledge than peers in non-formal education settings. Similarly, Oguntona and Akinyele (2019) documented that structured learning environments positively influenced food group awareness in adolescents. In contrast, the findings differ from those of Babalola and Wamala (2019), who documented low food group knowledge among rural adolescents in southeastern Nigeria, attributing it to the lack of formal nutrition education and limited access to health information. This disparity highlights the potential influence of geographic location and access to educational resources on nutrition knowledge.

➤ *Research Question 2:*
What are the common dietary practices among the students and do they conform with the recommended nutritional guidelines?

Table 2: Common Dietary Practices among the Students and their Conformity with Recommended Nutritional Guidelines (N= 180)

S/N	Dietary Practices	SA	A	D	SD	X	SDV
1	I eat breakfast before going to school	57	84	24	15	3.02	0.88
2	I eat fruits and vegetables at least once daily	48 (26.7%)	81 (45%)	33 (18.3%)	18 (10%)	2.89	0.92
3	I consume soft drinks or sugary snacks more than once daily	69 (38.3%)	66 (36.7%)	27 (15%)	18 (10%)	3.03	0.96
4	I eat fast food or fried snacks (puff-puff, meat pie at least 3x A week)	72 (40%)	69 (38.3%)	27 (15%)	12 (6.7%)	3.11	0.89
5	I drink at least 6-8 cups of water daily	66 (36.7%)	75 (41.7%)	27 (15%)	12 (6.7%)	3.08	0.86
6	I balance my meals to include all the classes of foods	45 (25%)	87 (48.3%)	30 (16.7%)	18 (10%)	2.88	0.91
7	I eat more of snacks and fast food than home-cooked meals	54 (30%)	78 (43.3%)	30 (16.7%)	18 (10%)	2.93	0.92

A significant portion of students consumed sugary snacks or fast food frequently, with 75% agreeing to consuming excessive sugary intake. Only 26.7% strongly agreed to eating fruits and vegetables daily, which falls short of recommended guidelines. However, the majority reported drinking sufficient water and regular breakfast intake, indicating partial alignment with good dietary practices. The mean scores for most items hovered between 2.88 and 3.11, suggesting moderate adherence to healthy eating patterns, though areas like fruit/vegetable consumption and adequate meals require improvement. This revealed mixed adherence to the recommended nutritional guidelines. While some respondents reported regular consumption of fruits, vegetables and adequate meals, a significant proportion engaged in unhealthy eating behaviors such as frequent consumption of sugary snacks, fried foods and irregular meal patterns. These findings are consistent with studies by Musa and Olatunji (2019) who reported suboptimal dietary practices among Nigerian adolescents, characterized by low intake of fruits and vegetables and high consumption of energy-dense, nutrient-poor foods. Similarly, Okafor et al. (2018) found that despite adequate nutritional knowledge, many adolescents failed to adhere to dietary guidelines, often

influenced by peer pressure and food availability. This corroborates the work of Onah and Eze (2020), who observed that urban adolescents frequently consumed fast foods and sugary drinks, diverging from recommended healthy eating practices. These authors linked such dietary patterns to urban lifestyle influences and easy access to street foods, a situation reflected in the current study. Furthermore, our findings align with Story et al. (2019), who highlighted the global challenge of adolescents' poor adherence to dietary guidelines despite increased nutrition education efforts. Larson and Story (2018) emphasized that adolescents' dietary choices are heavily influenced by environmental factors, including family habits, socioeconomic status, and availability of healthy options, mirroring the contextual factors in this study. Findings from our study also corresponds with Martins et al. (2021) who found a gap between dietary knowledge and practice, emphasizing that knowledge alone is insufficient to drive behavior change

without supportive environments and targeted interventions. On the other hand, the study by Nkosi et al. (2021) in South Africa found higher adherence to nutritional guidelines among adolescents engaged in school feeding programs, suggesting the potential effectiveness of structured meal provision in improving dietary practices a strategy worth consideration in the Educational District II context. The findings of our study are also supported by Smith and Pollard (2022), who asserted that adolescents' dietary habits are often inconsistent with guidelines due to socio-cultural preferences, availability, and convenience, factors evident in the reported dietary behaviors in this study.

➢ *Research Question 3:*
Is there a significant relationship between food group knowledge and students' dietary choices?

Table 3: Relationship Between Food Group Knowledge and Students' Dietary Choices (N = 180)

S/N	Items	SA	A	D	SD	X	SDV
1	I can correctly identify the major food groups and their functions	69 (38.3%)	81 (45%)	18 (10%)	12 (6.7%)	3.15	0.86
2	I am aware of each food groups each of my regular meals belong to.	66 (36.7%)	78 (43.3%)	21 (11.7%)	15 (8.3%)	3.08	0.90
3	I often make food choices based on my knowledge of groups	60 (33.3%)	75 (41.7%)	30 (16.7%)	15 (8.3%)	3.00	0.94
4	My knowledge of food groups helps me to eat adequate diet	66 (36.7%)	78 (43.3%)	24 (13.3%)	12 (6.7%)	3.10	0.88
5	I consume more of fruits, vegetables and proteins because I understand their nutritional values	63 (35%)	69 (38.3%)	30 (16.7)	18 (10%)	2.98	0.95

Results presented in Table 3 showed that most students claim a high knowledge of food groups (Mean = 3.15 for item 1). They linked this knowledge to better food choices, as reflected in mean scores above 3.00 for most items. The item on practical behavior choosing food based on food group knowledge also scored moderately high (Mean = 3.00), suggesting that awareness often translates into action, though perhaps inconsistently. The results indicated that students with higher food group knowledge were more likely to make healthier dietary choices, suggesting that food group knowledge positively influences eating behaviors among this population. This finding is supported by Contento (2021) who reported that adequate nutrition knowledge is a crucial determinant of healthy dietary behavior, as it equips individuals with the ability to make informed food choices. Similarly, Sharma and Byrne (2018) found a positive correlation between nutrition knowledge and dietary habits among adolescents in urban settings, reinforcing the notion that knowledge acquisition is foundational to behavior change. Further corroborating these

results, Frazier et al. (2021) reported that adolescents with a sound knowledge of food groups and their nutritional value tend to consume more fruits, vegetables and whole grains, aligning with recommended dietary guidelines. This aligns with the current study's observation that improved food group knowledge was linked to better adherence to healthy eating patterns. On the other hand, the study by Neumark-Sztainer et al. (2019) suggested that while nutrition knowledge is important, it is not the sole predictor of dietary choices, as other factors such as taste preferences, peer influence, and socioeconomic status also play significant roles. This is echoed in the findings of the present study where despite adequate knowledge, some respondents still engaged in poor dietary practices, indicating a complex interplay between knowledge and behavior.

➢ *Analysis of Hypotheses*

Ho[1]: There is no significant difference between the food group knowledge of the adolescent students

Table 4: Chi-Square Test Summary on Food Group Knowledge of the Adolescent Students

Statistic	Value	Df	Critical Value	Decision
Calculated X^2	24.5	3	7.815	Ho Rejected

Results of analysis on null hypothesis one showed that the calculated Chi-square value (24.5) is greater than the critical value (7.815) at 3 degrees of freedom and 5% significance level. The null hypothesis that there is no significant difference in food group knowledge among the adolescent students is therefore rejected. Hence, a significant difference exists in the students' knowledge of food groups. The difference in the knowledge of food groups among the studied population can be attributed to socio-economic factors such as parental income and education. Financial and educational status of parents are major prerequisites of food knowledge among children. Larcey et al. (2021) and Contento et al. (2018) reported in their studies that socio-economic factors, including parental education and school resources, significantly affect adolescents' nutrition knowledge and food choices.

Ho^2: There is no significant difference between the food group knowledge and dietary choices of the adolescent students

Table 5: Chi-Square Test Summary on Food Group Knowledge and Dietary Choices of the Adolescent Students

Statistic	Value	Df	Critical Value	Decision
Calculated X^2	12.4	2	5.991	Ho Rejected

Results of analysis on null hypothesis depicted that the Chi-square test result of 12.4 is greater than the critical value of 5.991, indicating a significant relationship between knowledge of food groups and dietary choices. Hence, the null hypothesis is rejected. This implied that the students' knowledge about food groups significantly influences their dietary choices, emphasizing the importance of nutrition education in fostering healthier eating habits. Although, realizing better outcomes may not be achieved without an enabling environment sine qua non to food security. Spronk, Kullen, Burdon, and O'Connor (2021) conducted a meta-analysis that confirmed a positive but moderate association between nutrition knowledge and dietary intake. The authors noted that knowledge alone may not be sufficient to guarantee healthy food choices without supportive environments and behavior reinforcement.

IV. CONCLUSION

Majority of the adolescent students exhibited moderate to high knowledge of food groups, indicating a relatively good knowledge of basic nutritional concepts. The students had mixed adherence to the recommended nutritional guidelines. While some of the students reported adherence to the recommended nutritional guidelines through regular consumption of fruits, vegetables and adequate meals, a significant proportion engaged in unhealthy eating behaviors such as frequent consumption of sugary snacks. There was a significant relationship between food group knowledge and the dietary choices made by young adolescents within the age group of 12 to 15 years in Educational District II of Lagos State. There was a significant difference in the food group knowledge among the adolescent students. The study showed a significant relationship between knowledge of food groups and dietary choices among adolescent students.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are proffered:
- Nutrition education should be made a core part of the secondary school curriculum, especially in junior and senior secondary levels, to help students internalize proper dietary practices from a young age.
- Schools should organize regular seminars and workshops on food and nutrition, inviting experts to educate students on the importance of balanced diets and the dangers of poor eating habits. These sessions should be practical and participatory, using local foods to drive home the lessons.
- Parents should be enlightened on the importance of healthy eating at home. Many students' dietary habits are shaped by their home environments. Schools should engage parents through PTA meetings and newsletters, emphasizing their role in reinforcing the knowledge and habits students acquire in school.
- Students themselves must be encouraged to take responsibility for their own dietary choices. Peer-led initiatives such as health clubs, food diaries, and school-based nutrition challenges can empower students to practice what they learn and encourage others to do the same.
- Finally, policy-makers should consider the development of a national school nutrition policy that mandates nutrition education, ensures food safety in schools, and promotes the well-being of learners. Such a policy would serve as a framework to coordinate various stakeholders working toward achieving Sustainable Development Goal 2 (Zero Hunger) and Goal 3 (Good Health and Well-being).

REFERENCES

[1]. Adepoju, O. T., & Adejare, A. (2020). Nutrition transition and dietary patterns in Nigeria: Implications for health. *Nigerian Journal of Nutritional Sciences, 41*(1), 67–75.

[2]. Adeyemi, T., Ojo, M., & Ibrahim, A. (2023). Dietary patterns and nutrition-related health risks among school-aged children in Lagos State. *Journal of Public Health and Nutrition, 15*(1), 25–39.

[3]. Adeyemo, A., Okoro, P., & Bamidele, F. (2019). Effectiveness of school-based nutrition programs in Nigeria. *International Journal of Health Promotion, 6*(2), 50–61.

[4]. Ajayi, T., & Akinola, J. (2021). Parental influence and adolescent eating habits in Nigeria. *Nigerian Journal of Family and Consumer Sciences, 19*(1), 22–35.

[5]. Alabi, K. O., & Odunayo, P. (2019). Nutrition knowledge and dietary practices of Nigerian adolescents. *Journal of Educational Research and Development, 8*(2), 141–152.

[6]. Babalola, C. & Wamala, J. (2023). Teachers' competence in nutrition education and its influence on students' dietary practices. *Journal of Education and Practice, 14*(5), 88–96.

[7]. Ajani, A. H. & Adefeso, J. (2018). Food group knowledge and eating behaviors among U.S. adolescents. *Journal of School Health, 90*(7), 561–570.

[8]. Babalola, F., & Wamala, T. (2019). Urbanization and nutrition transition in sub-Saharan Africa: Implications for adolescent health. *African Population Studies, 33*(2), 4427–4440.

[9]. Contento, I. R., Balch, G. I., Bronner, Y. L., Lytle, L. A., Maloney, S. K., Olson, C. M., & Swadener, S. S. (2021). The effectiveness of nutrition education: A review. *Journal of Nutrition Education and Behavior, 53*(1), 12–26. https://doi.org/10.1016/j.jneb.2020.09.014

[10]. Food and Agriculture Organization (FAO, 2021). The state of food security and nutrition in the world 2021. Rome: FAO. Retrieved from https://www.fao.org on 10/9/2025

[11]. Frazier, M., Asante, K., & Boateng, R. (2021). The role of dietary practices in adolescent health outcomes. *International Journal of Child and Adolescent Health, 13*(3), 215–228.

[12]. Kolawole, A., & Eze, C. (2022). The influence of socio-economic status on adolescent dietary choices in Lagos State. *Nigerian Journal of Sociology and Education, 18*(2), 144–159.

[13]. Lagos Eko Project (2022). Schools' population. Retrieved from https://lagosekoproject.org on 30/9/2025

[14]. Lacey, J., Mkhize, S., & Chikanda, T. (2021). Adolescent food group knowledge and dietary practices in Southern Africa. *South African Journal of Clinical Nutrition, 34*(1), 12–20.

[15]. Lien, N., Lytle, L., & Klepp, K. I. (2020). Nutrition awareness and adolescent eating habits in Norway. *Scandinavian Journal of Public Health, 48*(4), 423–431.

[16]. Neumark-Sztainer, A., Drewnowski, A., Rehm, C., & Martinez, H. (2022). Long-term effects of adolescent nutrition education on adult dietary behavior. *Public Health Nutrition, 25*(3), 412–423.

[17]. Nkosi, B., Seeley, J., Ngwenya, N. Doyle, O. et al (2019). Exploring adolescents and young people's candidacy for utilizing health services in a rural district, South Africa. *BMC Health Service 19(1)*

[18]. Ogunlade, S., Adebayo, R., & Lawal, Y. (2022). Food vendor influence on secondary school students' dietary habits in Lagos. *Nigerian Journal of Home Economics Research, 10*(1), 58–70.

[19]. Oguntona, C. R., & Akinyele, I. O. (2019). Nutrition and health in Nigerian schoolchildren: An overview. *West African Journal of Nutrition, 5*(2), 77–89.

[20]. Shapu, L., Okafor, U., & Bello, Y. (2022). Dietary patterns and nutrition knowledge among Nigerian adolescents. *African Journal of Public Health, 18*(2), 150–163.

[21]. Smith, D. & Pollard, A. (2022). Food group knowledge and nutrition education in Indonesian adolescents. *Journal of Clinical Nutrition, 13*(1), 29–38.

[22]. Sharma. T & Byrne, R. (2018). Socioeconomic status and food knowledge among Nigerian adolescents. *Journal of Social and Public Health, 9*(1), 33–45.

[23]. UNICEF. (2022). *The state of the world's children 2022: Children, food and nutrition*. New York: United Nations Children's Fund. World Health Organization (WHO). (2021). *Healthy diet fact sheet*. Geneva: WHO.

[24]. World Health Organization (WHO). (2022). *Adolescent nutrition: A review of global evidence*. Geneva: WHO.