

Brief Research Report



Adolescent Students' Nutritional Knowledge in Boarding Schools and Strategies for Improving their Nutritional Status

Osasona Foluso Adedoyin^{1*}

¹Department of Home Economics and Hospitality Management Education, University of Nigeria, Nsukka, Enugu State, Nigeria

***Correspondence:** Osasona Foluso Adedoyin, Department of Home Economics and Hospitality Management Education, University of Nigeria, Nsukka, Enugu State, Nigeria (Email: adedoyinfoluso@gmail.com).

Abstract: This study investigated adolescent students' nutritional knowledge in boarding schools and potential strategies for improving their nutritional status in the Ido-Osi Local Government Area of Ekiti State, Nigeria. The researcher used purposive sampling to select three government colleges and private college boarding schools in the Ido-Osi Local Government area. The sample consisted of 80 boarding house students. Data was collected using a questionnaire, and the statistical analysis involved frequency and percentages. The findings revealed that a good percentage of the boarding school students have good nutritional knowledge. The majority of students believed that both the Federal and State Government, as well as schools, parents, and communities, should work together to improve the food system in order to combat nutritional challenges in boarding schools. Thus, the study recommends that the Government, parents, schools, and communities collaborate to address any nutrition issues among adolescent students in boarding schools. This could involve initiatives such as establishing school gardens and providing support to local farmers, among other strategies. Future research should aim to enhance our understanding of adolescent students' nutritional knowledge in boarding schools and develop effective strategies to improve their nutritional status. This will contribute to the overall health and well-being of these students during their critical developmental years.

Keywords: Adolescent Students, Boarding Schools, Food System Transformation, Nutrition

1. Introduction

Malnutrition in adolescents encompasses both undernutrition and overnutrition, which includes being underweight, stunted growth, micronutrient deficiencies, and being overweight for one's age and sex. The dual burden of malnutrition in the same adolescent reflects a poor quality diet and illness during the first year of life, followed by excessive energy consumption during adolescence or later stages of life. Malnutrition is a condition that occurs when the body is deprived of the vitamins, minerals, and other nutrients it needs to maintain healthy tissues and organs (WHO, n.d.). Adolescence is the transitional period of physical and psychological development between childhood and adulthood, and an adolescent is any person between the ages of 10 and 19. This age range falls within the WHO's definition of young people, which refers to individuals between the ages of 10 and 24. Geuzaine et al. (2000) noted that during adolescence, a sense of separation from parents arises. While this sense of separation is a necessary step in the transition to self-sufficiency, it can also bring about various challenges and adjustments for many adolescents. Other characteristics of adolescent boys and girls include easily feeling hungry, becoming self-conscious, worrying about appearance, and showing concern about the future. They may also experience emotional changes, moodiness, stress and anxiety (Gadagnoto et al., 2022; Rudolph, 2002). Adolescents face different challenges and have specific needs. They crave independence and do not want to be constantly directed by parents, siblings, or other adults. They desire recognition and want to be acknowledged as individuals. Adolescents also struggle with adjustment, as they find it difficult to adapt to the physical changes in their bodies. Girls experience changes such as enlarged breasts, curved hips, and the start of menstruation, while boys grow beards and have deeper voices. These changes can make them feel uncomfortable, shy, moody, anxious, and uneasy.

Adolescents often prefer to spend time with their peer group and can be easily influenced by their peers, sometimes in negative ways such as fashion, alcoholism, and drug use. They also have psychological needs and go through behavioral and emotional changes. It is important for parents to understand the challenges faced by adolescents and provide support, show concern for their problems, provide sex education and nutritional education to address all forms of malnutrition, and help them adjust in school. A boarding school is an institution where children live on the premises while receiving formal instruction. The term "boarding" refers to lodging and meals. According to the World Food Programme (2023), school meals play an important role in fighting hunger and malnutrition. When properly designed, schools have the potential to improve the diets and nutrition knowledge and practices of millions of school children and their communities. The food system promotes sustainable local value chains and aims to improve food security and nutrition. Transformation is a process that involves changing behaviors to achieve desired outcomes. Individuals can go through a transformation process that affects their intellect and overall well-being. The FAO (2020) states that organizations can also undergo food system transformation processes through policy improvement at various levels. The growth patterns of female and male adolescents are distinct. Hormones play a significant role in the intensity of the adolescent growth spurt, affecting every organ in the body, including the brain. After two or three years of intense growth and a few more years at a slower pace, physically mature adults emerge. This stage is sensitive to malnutrition due to the physical need for nutrition, which can be affected by insufficient, excessive, or unequal energy intake, ultimately impacting the future generations of adolescents.

Malnutrition in adolescent students, especially those in boarding schools, is associated with deficiencies in muscular strength and working capacity, poor educational performance, increased

susceptibility to infection, and an increased risk of chronic non-communicable diseases and disability (United Nations Development Programme, 2019). Inadequate diet during this period can result in decreased learning ability, delayed sexual maturity, micronutrient deficiencies, lack of concentration, and impaired cognitive performance, which undermines physical and economic growth, limits the body's ability to absorb nutrients, and perpetuates poverty. Worldwide, 10% of adolescents are overweight and 2-3% are obese. The percentages of overweight and obese adolescent boys aged 15-19 are 29% and 59%, respectively. Overweight/obesity is now the fifth leading risk for mortality worldwide (WHO, 2021). Estimates from the WHO suggest that non-communicable chronic diseases will account for approximately three-quarters of all deaths in the developing world by 2020. Malnutrition in adolescents contributes to an increase in diseases, disability, and the intergenerational effects of malnutrition.

According to Kola-Raji et al. (2017), nutritional status significantly contributes to attendance, concentration, and academic achievements of students. Adolescents who do not find the school environment comfortable, especially due to poor nutrition, are more susceptible to truancy, gangsterism, and other social norms. To address this issue, many parents send their children to boarding schools, where the schools are responsible for their accommodation and meals. These schools are expected to provide balanced nutrition, moral discipline, and quality education, for which parents pay higher fees compared to day students who return home daily. Unfortunately, many of these boarding schools, especially those owned by the government, have deteriorated in terms of providing balanced and adequate nutrition due to poor food systems in the state (Nwadiimkpa & Onyeaso, 2023). The WHO (2021) states that our food systems are broken and threaten the health of both people and the planet. Unsustainable practices have been degrading soils for decades, and the expansion of agriculture is the primary driver of habitat loss globally. Current agricultural and food systems also drive inequality and hunger (Obayelu & Obayelu, 2020). While there is sufficient global food production to feed the world, 10% of the population goes hungry due to unequal distribution and access to food. The structure of the food system is not set to improve, as global food demand is expected to increase by 50% by 2050, negatively impacting land and soil degradation. Food production also accounts for a quarter of global greenhouse gas emissions (United Nations Development Programme, 2021). The FAO (2015) has reiterated that climate change is already affecting food security and that any warming beyond 1.5°C above preindustrial averages will have increasingly severe impacts on the food system.

The Federal Government, in collaboration with the United Nations, is working to improve Nigeria's food systems. Osibanjo (2021) stated that this effort aims to address hunger, combat malnutrition, and reduce diet-related diseases. The government and the UN have conducted public dialogues at national and sub-national levels, leading to the presentation of Nigeria's food systems mapping report to state governments across the six geopolitical zones. Osibanjo also mentioned that Nigeria is considering an "Operation Feed Yourself" initiative to tackle malnutrition. The initiative, a collaboration between the federal and state governments under the National Economic Council (NEC), will encourage the establishment of urban farmers and small home gardens as part of efforts to address malnutrition and related challenges. In Ekiti State, the Governor has initiated a program called "Ekiti to Become the Nation's Food Basket" to focus on agriculture and rural development. The governor emphasized the importance of agriculture in the state's drive towards economic development, stating that strong determination is needed to achieve significant agricultural production and combat malnutrition in the state (Samson, 2018). The Dolati et al. (2021) emphasized

the need to ensure that all boarding school students have access to school meals and are healthy and ready to learn.

School gardens serve as a learning platform to promote better nutrition, develop life skills, and increase environmental awareness. Growing and preparing food from the garden at school, combined with nutrition education, can establish and enforce school policies and practices that improve health and nutrition, increase students' preferences for fruits and vegetables, and provide healthy meals and snacks. This improves children's health and nutritional well-being, enabling them to grow when combined with nutrition education. Qualified personnel can teach and guide children, integrating food and nutrition education with other subjects. Involving parents in students' nutrition education and spurring community participation through school garden projects, school feeding programs can provide cost-effective nutrition interventions and opportunities to practice healthy eating habits. These programs help fight malnutrition and keep students in school (FAO, 2005). Malnutrition is a significant public health concern, particularly among adolescent students in boarding schools. In the Ido-Osi Local Government Area of Ekiti State, malnutrition among this population appears to be a growing issue. Thus, this study investigated adolescent students' nutritional knowledge in boarding schools and potential government strategies for improvement in the Ido-Osi Local Government Area of Ekiti State, Nigeria.

1.1. Statement of Problem

Adolescents face challenges related to overeating, undereating, and consistently making poor food choices, which can lead to obesity. On the other hand, some adolescents develop problems with unhealthy eating habits without meeting the minimum nutritional requirements for healthy growth and development. Nutritional deficiencies and poor eating habits established during adolescence can have long-term consequences, such as delayed sexual maturation, stunted growth, osteoporosis, hyperlipidemia, and obesity. Unsustainable food production poses a threat to food security. For example, issues like soil erosion and water shortages can impact food production. Climate change also has the potential to affect food production, as do factors like insufficient feeding for animals and high prices for agricultural inputs. The recent scarcity of fuel in the country and insufficient productive chains, along with supply and recipient issues, further contribute to the challenges faced in food production. Furthermore, some farmers lack agricultural knowledge, exacerbating the situation. As a result, some boarding schools may experience food insecurity, which could result in students receiving insufficient or unhealthy meals (Chen et al., 2018). Malnutrition among Nigerian boarding school students in particular is a significant public health concern. The quality and quantity of food that these students consume plays a crucial role in their nourishment and weight (Nnaemezie et al., 2013). Boarding school adolescents in Ido-Osi local government area of Ekiti State suffer from different forms of malnutrition, such as being overweight or underweight, which affects their growth and overall well-being. These students often skip meals and have an inadequate diet. Moreover, it can be challenging for parents to ensure that their children receive a balanced diet when they are not actively involved in planning and preparing their meals.

1.2. Purpose of the Study

This study's main purpose is to investigate adolescent students' nutritional knowledge in boarding schools and potential strategies for improvement of their nutritional status in the Ido-Osi Local Government Area of Ekiti State, Nigeria. Specific purposes are to investigate:

- (a) Adolescent students' nutritional knowledge in boarding schools.
- (b) Potential strategies for improvement of nutritional status of students in boarding schools.

1.3. Research Questions

The following research questions guided the study:

- (a) What are adolescent students' nutritional knowledge in boarding schools?
- (b) What are potential strategies for improving students' nutritional status in boarding schools?

2. Materials and Methods

The study was a descriptive survey involving public and private secondary schools, comprising male and female adolescent students aged 12-15 years in the Ido-Osi local government area of Ekiti State. A purposive sampling technique was used to select the sample for the study. A total of 80 students, randomly selected from three government colleges and one private school boarding house, were included in the study. The questionnaire method was used to collect data, and the data obtained from the study were subjected to statistical analysis using frequency count and percentages.

3. Results and Discussion

3.1. Research Question 1: What are adolescent students' nutritional knowledge in boarding schools?

Table 1: Adolescent students' nutritional knowledge in boarding schools

S/N	Items Description	Yes (%)	No (%)
1.	Serving the meal regularly helps to prevent malnutrition	8(12.5%)	2(2.5%)
2.	Adding fruits and vegetables regularly to the school meals is healthy	8 (10%)	2(2.5%)
3.	A well fed students performed better in academics.	8(10%)	2(2.5%)
4.	Good nutrition promote good health	7(8.75%)	3(3.73%)
5.	Underweight leads to lack of concentration in the classroom	8(2.5%)	2(2.5%)
6.	Overweight leads to obesity in adolescence stage of life.	40(25%)	4(5%)
7.	Good nutrition promote healthy living	10(12.5%)	3(3.73%)
8.	Nutrition education should be inculcated in the school curriculum	80(12.5%)	3(3.73%)
	Total	73.75%	26.25%

From Table 1, it can be observed that most students responded positively to the questions regarding their nutritional knowledge in boarding schools. The results showed highest affirmation rate of 73.75% among the students in Ido-Osi Local Government Area of Ekiti State.

3.2. Research Question 2: What are potential strategies for improving students' nutritional status in boarding schools?

Table 2: Potential strategies for improving students' nutritional status in boarding schools

S/N	Items Description	Yes (%)	No (%)
1.	School meals should be made free for boarding school students	6(7.5%)	4(51%)
2.	Government policies should support free school meals	7*8.75%)	3(3.75%)
3.	Government should establish school garden	8(10%)	2(2.5%)
4.	Improving food system transformation will prevent malnutrition	7(11.25%)	1(1.25%)
5.	Community participation via school garden is helpful	8(10%)	2(2.5%)
6.	Parents collaborate with government to improve food system transformation	7(8.75%)	3(3.75%)
7.	Serving of healthy meals and mild-day snacks help students to learn better	8(10%)	2(2.5)
8.	Government to support farmers in the country by empowering the farms help food system transformation	8(10%)	2(2.5%)
Total		76.25%	23.75%

Table 2 shows that students also responded positively to the question about the strategies to improve nutritional status of students in boarding schools. The results showed highest affirmation rate of 76.25% among the students in Ido-Osi Local Government Area of Ekiti State.

The findings of the study revealed that the majority of students demonstrated positive nutritional knowledge in the boarding schools. The majority of students also responded positively to the strategies that could improve their nutritional status in boarding schools. According to Eze et al. (2018), boarding schools and government can provide good meals to assist secondary school boarders maintain a healthy nutritional status, which is essential for their overall well-being and school success. Recent research by Omenyi et al. (2023) emphasized the need for school principals and government policies to support education laws regarding the feeding of school boarders. According to Nicholaus et al. (2020), to ensure that boarding school students receive the necessary nutrients for growth and development, it is crucial to encourage them to consume a diet rich in fruits, vegetables, and protein. Also, the authors stressed the importance of monitoring these students' eating habits to help ensure they are getting adequate amounts of required micronutrients. It is also beneficial to encourage these boarding school students to try new foods and avoid monotonous diets that may lack essential nutrients (Nicholaus et al., 2020). According to Boarding Bites (2023), boarding school students be encouraged to make better food choices through prospective planning of meals, engaging them at home in grocery shopping and preparation of meals, and teaching them how to make a list of healthy meals. Furthermore, education of parents is a crucial step in promoting an understanding of the significance of a balanced diet and improving nutritional status for boarding school students' health and well-being (Umoke et al., 2020). For Wilbraham and Monson Academy (2020), proper nutrition can also help foster healthy living among boarding school students. Allenby (2014) also noted that in boarding schools, teaching students the association between nutrition and

achievement in the classroom, on the sports field, and in their daily lives is important. It is vital for students to be encouraged to pay attention to their body's hunger and fullness signals and discuss the significance of a balanced diet with their parents or guardians (Boarding Bites, 2023). Given the findings and supporting literature, it is agreeable that this research sheds light on the nutritional knowledge of adolescent students in boarding schools. It also provides insights into perspectives on strategies that could employ by schools, government and the community to promote the nutritional status of boarding school students. The implication is that understanding the nutritional knowledge of boarding school students and the expected roles required of schools, government and the community can be valuable in devising effective interventions to address malnutrition among this population, while also contributing to broader initiatives aimed at combating malnutrition among them. By implementing a food system transformation, the researcher believes that we may have the potential to improve the nutritional status of these students.

Further research should be conducted to explore the factors that influence adolescents' nutritional knowledge in boarding schools. This will help identify the specific areas that need improvement and guide the development of targeted interventions. Also, investigating the role of parents, teachers, and the school environment in shaping students' nutritional knowledge can provide valuable insights for designing effective educational programs. Furthermore, it is important to examine the relationship between nutritional knowledge and actual dietary behavior among boarding school students. This will help determine whether there is a gap between knowledge and practice and inform the development of interventions that promote healthy eating habits. Future research should also focus on evaluating the effectiveness of different strategies for improving the nutritional status of adolescent students in boarding schools. This can include interventions such as nutrition education programs, school-based healthy food initiatives, and collaborations with food service providers to provide nutritious meals. Moreover, understanding the barriers and facilitators to implementing these strategies in boarding schools is vital. Factors such as cost, availability of healthy food options, and the influence of peer groups may impact the success of interventions. Identifying these factors can inform the development of strategies that are feasible and sustainable in the boarding school setting.

4. Conclusion

Majority of the students demonstrated positive nutritional knowledge in the boarding schools. The majority of students also responded positively to the strategies that could improve their nutritional status in boarding schools. Thus, it is essential to provide boarding house students in Ido-Osi local government area with adequate nutrition, a balanced diet, and properly prepared food. The responsibility of preventing malnutrition lies with the government, school management, and parents of the students. Malnutrition can only be prevented through a transformation of our food system. It is crucial for the government, parents, students, teachers, and students themselves to work together to combat malnutrition in boarding schools among adolescents. By doing so, we can ensure that all boarding schools across the state have a sufficient supply of food.

Acknowledgements

The author would like to thank the students for participating in this study.

Conflict of Interest

The author declare no conflict of interest.

Author Contributions

The study's conceptualization, methodology, writing, data collection, analysis and revision were solely performed by OFA.

Data Availability Statement

The dataset used for this study is available on request. For further inquiries can consult the authors.

Funding Information

This study was not funded by any organization.

References

- Allenby, S. (2014, June 11). Boarding School Nutrition: Fueling the Adolescent Brain. <https://blogs.proctoracademy.org/boarding-school-nutrition-fueling-the-adolescent-brain>
- Boarding Bites (2023, April 21). The ultimate guide to boarding school nutrition: top tips for healthy eating, meal planning, and snack solutions for your student. <https://boardingbites.co.uk/blogs/boarding-school-tips/nutritional-tips-for-boarding-school>
- Chen, Q., Pei, C., & Zhao, Q. (2018). Eating more but not better at school? Impacts of boarding on students' dietary structure and nutritional status in rural Northwestern China. *Sustainability*, 10(8), 2753. <https://doi.org/10.3390/su10082753>
- Dolati, S., Namiranian, K., & Abdollahi, Z. (2021). Global Assessing Quality of Nutrition in Boarding Schools: A Review. *Nutrition and Food Sciences Research*, 8(4), 5-11.
- Eze, N. M., Okwume, U. G., Eseadi, C., Udenta, E. A., Onyeke, N. G., Ugwu, E. N., Akubue, B. N., Njoku, H. A., & Ezeanwu, A. B. (2018). Acceptability and consumption of tofu as a meat alternative among secondary school boarders in Enugu State, Nigeria: Implications for nutritional counseling and education. *Medicine*, 97(45), e13155. <https://doi.org/10.1097/MD.00000000000013155>
- FAO. (2005). Setting up and running a school garden – A manual for teachers, parents and communities. Rome. <https://www.fao.org/3/a0218e/a0218e.pdf>
- FAO. (2015). Climate change and food security: risks and responses. Rome. <https://www.fao.org/3/i5188e/I5188E.pdf>
- FAO. (2020). FAO COVID-19 Response and Recovery Programme -Food systems transformation: Building to transform during response and recovery. Rome. <https://doi.org/10.4060/cb0281en>
- Gadagnoto, T. C., Mendes, L. M. C., Monteiro, J. C. D. S., Gomes-Sponholz, F. A., & Barbosa, N. G. (2022). Emotional consequences of the COVID-19 pandemic in adolescents: challenges to public health. *Revista da Escola de Enfermagem da USP*, 56, e20210424. <https://doi.org/10.1590/1980-220X-REEUSP-2021-0424>
- Geuzaine, C., Debry, M., & Liesens, V. (2000). Separation from parents in late adolescence: The same for boys and girls?. *Journal of Youth and Adolescence*, 29(1), 79-91. <https://doi.org/10.1023/A:1005173205791>
- Kola-Raji, B. A., Balogun, M. R., & Odugbemi, T. O. (2017). A comparative study of nutritional

- status of adolescents from selected private and public boarding secondary schools in Ibadan, South Western Nigeria. *Journal of Medicine in the Tropics*, 19(1), 49-55. https://doi.org/10.4103/jomt.jomt_43_16
- Nicholaus, C., Martin, H. D., Kassim, N., Matemu, A. O., & Kimiywe, J. (2020). Dietary Practices, Nutrient Adequacy, and Nutrition Status among Adolescents in Boarding High Schools in the Kilimanjaro Region, Tanzania. *Journal of nutrition and metabolism*, 2020, 3592813. <https://doi.org/10.1155/2020/3592813>
- Nnaemezie, N.O., Ezekwe, C.F., Nwankwo, S.N., Ifediora, U.L., Bosah, C.N. (2013). Nutritional Health Problems of Boarding House Students in Idemili North Local Government Area of Anambra State Nigeria. *Texila International Journal of Public Health*, 8(2), Art. No. 20. <https://doi.org/10.21522/TIJPH.2013.08.02.Art020>
- Nwadiwaka, O. J., & Onyeaso, A. O. (2023). Constraints to Environmental Hygiene Practices Among Boarding Students in Awka-South LGA of Anambra State. *Journal of Advances in Education and Philosophy*, 7(8), 323-331. <https://doi.org/10.36348/jaep.2023.v07i08.011>
- Obayelu, A. E., & Obayelu, O. A. (Eds.). (2020). *Developing Sustainable Food Systems, Policies, and Securities*. IGI Global.
- Omenyi, A. S., Nwankwo, I. N., & Okafor, F. N. (2023). Principals' implementation of education laws on feeding of boarding school students in mission-owned secondary schools in Anambra state, Nigeria. *African Journal of Educational Management, Teaching and Entrepreneurship Studies*, 10(1), 193-202.
- Osibanjo, Y. (2021, June 29). Consolidatory Dialogue For UN Food Systems Summit On 29/06/2021. Keynote address by his excellency, prof. Yemi Osinbajo, SAN, GCON, vice president, Federal Republic of Nigeria at the Consolidatory Dialogue for the UN Food Systems Summit held on Tuesday, 29th June, 2021. <https://www.yemiosinbajo.ng/consolidatory-dialogue-for-un-food-systems-summit-on-29-06-2021/>
- Rudolph, K. D. (2002). Gender differences in emotional responses to interpersonal stress during adolescence. *Journal of Adolescent Health*, 30(4), 3-13. [https://doi.org/10.1016/S1054-139X\(01\)00383-4](https://doi.org/10.1016/S1054-139X(01)00383-4)
- Samson, W. (2018, November 11). Ekiti to become nation's food basket, says Fayemi. Vanguard Media Limited, Nigeria. <https://www.vanguardngr.com/2018/11/ekiti-to-become-nations-food-basket-says-fayemi/>
- Umoke, M., Umoke, P. C. I., Onyeke, N. G., Victor-Aigbodion, V., Eseadi, C., Ebizie, E. N., Obiweluzo, P. E., Uzodinma, U. E., Chukwuone, C. A., Dimelu, I. N., Uwakwe, R. C., Uba, M. B. I., Elom, C. O., & Folorunsho, R. O. B. (2020). Influence of parental education levels on eating habits of pupils in Nigerian primary schools. *Medicine*, 99(43), e22953. <https://doi.org/10.1097/MD.00000000000022953>
- United Nations Development Programme. (2019, October 16). Responding to the Challenge of Non-Communicable Diseases. <https://www.undp.org/publications/responding-challenge-non-communicable-diseases>
- United Nations Development Programme. (2021, October 4). Transforming food systems – from the ground up. <https://www.undp.org/blog/transforming-food-systems-ground>
- Wilbraham and Monson Academy (2020, November 13). Tips for staying healthy at boarding school. <https://www.wma.us/about/titan-blog/post/~board/titan-blog/post/tips-for-staying-healthy-at-boa>

rding-school

WHO. (n.d.). Malnutrition. https://www.who.int/health-topics/malnutrition#tab=tab_1

WHO. (2021, June 9). Obesity and overweight. <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>

WHO. (2021, December 7). Food systems for health: information brief. <https://www.who.int/publications/i/item/9789240035263>

World Food Programme (2023, March 21). The State of School Feeding Worldwide 2022. <https://www.wfp.org/publications/state-school-feeding-worldwide-2022>

Publisher: Department of Home Economics and Hospitality Management Education, University of Nigeria, Nsukka 41001, Nigeria

© 2023 the Author(s), licensee Department of Home Economics and Hospitality Management Education, University of Nigeria, Nsukka, Nigeria. This is an open access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>)