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Assessment of food hygiene knowledge and practices among secondary school students in Ethiope East Local Government Area of Delta State

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Abstract
Food hygiene habits among secondary school students are still a major issue of collective health concern especially in a setting where the students are likely to take food offered by vendors, school canteens and informal businesses. Lack of knowledge and practice may expose the student to food borne diseases, thus impacting their health and school performance. This paper thus evaluated the knowledge and practices of food hygiene among secondary school students in Ethiope East Local Government Area in Delta State, Nigeria. Out of the population of approximately 1,200 students a sample of 300 was sampled through a multistage sampling method so that there was appropriate representation. The structured questionnaire was used to gather data and it was validated by experts and tested to determine its reliability. The tool not only recorded demographic but also hygiene habits. Mean and standard deviation were used to analyze the data where a benchmark of 2.50 was used to make decisions and interpretations. The findings revealed that among the 300 respondents, 44 percent were male and 56 percent were female, which means that there were more women respondents. Results on knowledge of food hygiene practices showed that the items had a mean score of more than 2.50, which indicated that the students had sufficient knowledge of good hygiene such as handwashing, safe food handling and consumption of clean water. Equally, the data on real life practices revealed that the students tended to adhere to good hygienic practices including washing hands, cleaning utensils and avoiding contaminated food. Nevertheless, the lowest mean, but within acceptable ranges, indicates that there were overall positive hygiene behaviors towards sharing of eating utensils. The researchers found out that though students show sufficient knowledge of food hygiene and overall good food hygiene practices, there should be continuous sensitization and reinforcement of good hygiene behaviours in order to reduce health risks.

Keywords: Food hygiene, Knowledge, Practices, Secondary school students, Health outcomes

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Introduction

Food is an indispensable requirement for human existence, as it provides the energy and nutrients necessary for growth, development, and maintenance of health. However, while food is central to human survival, it also has the potential to become a vehicle for disease transmission when not handled properly. The preparation, handling, storage, and consumption of food all involve processes that can either promote health or contribute to illness. When food is contaminated, it exposes consumers to a wide range of foodborne diseases, some of which may result in long-term health complications or even death. Thus, food safety and hygiene practices are integral for public health, especially in environments where large groups of people, such as schools, regularly consume food prepared by others.

Globally, foodborne diseases have emerged as a major public health concern due to their prevalence, health impact, and economic consequences. The World Health Organisation [WHO] (2018) estimates that unsafe food causes approximately 600 million cases of foodborne illnesses and

420,000 deaths every year. This means that almost one in every ten people worldwide falls ill after consuming contaminated food. Vulnerable groups, such as children, pregnant women, the elderly, and individuals with weakened immune systems, are disproportionately affected. This not only has health implications but also poses a significant burden on the global economy, including increased healthcare expenditures, productivity losses, and trade restrictions. These findings showed that food hygiene is not only a domestic or individual concern, but a global health and development issue that requires urgent attention

Nigeria, a country in the sub-Saharan African region, also contributes substantially to the global burden of foodborne illness. According to the report of EatSafe Launch in Nigeria, unsafe food results in an estimated 173 million cases of diarrhoea due to foodborne illness, and approximately 33,000 deaths yearly (Global Alliance for Improved Nutrition [GAIN], 2021). Foodborne illnesses remain widespread in the country and are exacerbated by systemic issues such as inadequate infrastructure, poor sanitation, and limited enforcement of food safety regulations (Lee & Yoon, 2021). Studies have documented frequent outbreaks of diarrhoeal diseases, typhoid fever, and food poisoning in different parts of the country, many of which are traced back to poor food handling practices (GAIN, 2021; Ehidiamhen et al, 2025). Common practices such as irregular handwashing, eating uncovered food, sharing utensils, drinking unsafe water, and consuming improperly cooked or stored meals significantly increase the risk of infection. Adolescents and young people, who often purchase meals from roadside vendors or school canteens, are particularly vulnerable. According to Okojie and Isah (2014) as well as Omemu and Aderoju (2008), a significant number of food vendors operating around Nigerian schools fail to comply with basic hygiene standards, and this has been associated with recurring outbreaks of gastrointestinal illnesses among students. These highlight the need to strengthen food hygiene education and practices, particularly within the school setting

Food hygiene refers to all practices involved in ensuring food safety from production to consumption (i.e., from farm to fork). It encompasses a wide range of practices, including personal hygiene of food handlers, proper cleaning of utensils and equipment, safe storage conditions, adequate cooking temperatures, hygienic serving practices, and appropriate waste disposal (Food and Agriculture Organisation [FAO] & World Health Organisation [WHO], 2023). Food safety, on the other hand, refers to the overall concept of protecting food from hazards that can make it unsafe for consumption. These hazards may be biological (e.g., bacteria, viruses, parasites), chemical (e.g., pesticides, food additives, contaminants), or physical (e.g., glass, metal fragments, or foreign objects). Food safety ensures that food will not cause harm to the consumer when it is prepared and eaten according to its intended use (Ncube, 2025). It involves the application of control measures, regulations, and standards at every stage of the food chain. While food hygiene focuses on the day-to-day measures to maintain cleanliness and prevent contamination, food safety involves a broader perspective, incorporating policies, regulations, risk assessment, and monitoring systems designed to guarantee that food reaching the consumer is wholesome and fit for human consumption

Secondary school students constitute one of the groups most at risk of the consequences of poor food hygiene. Adolescents, by reason of their developmental stage, have immune systems that are still maturing and may not be able to withstand repeated exposure to pathogens. Moreover, this age group often exhibits low risk perception and inconsistent adherence to hygiene practices. For instance, many students eat meals without washing their hands, drink from unsafe water sources, share utensils or cups with peers, and sometimes eat food that is improperly cooked or stored. In addition, the majority of secondary school students rely heavily on food purchased from canteens or local vendors within or around their school premises. Unfortunately, these outlets often lack basic hygiene facilities such as clean water, soap, and proper waste disposal systems. In Ethiope East Local Government Area of Delta State, anecdotal reports and health records suggest that gastrointestinal complaints such as diarrhoea and typhoid fever are common among students after eating food bought within school environments. This highlights the influence of students' food hygiene practices on their health outcomes.

The consequences of poor food hygiene among students are multifaceted. In the immediate term, contaminated food may cause acute illnesses such as diarrhoea, vomiting, and abdominal pain, which can lead to dehydration and hospitalisation in severe cases. When such episodes are recurrent, they can contribute to malnutrition, stunted growth, and weakened immunity in adolescents, thereby compromising their overall development. Furthermore, poor health has a direct impact on academic performance, as sick students are more likely to be absent from school, less attentive in class, and unable to achieve their full academic potential. The implications also extend to the broader community: secondary schools are social environments where students interact closely with one another, making them fertile grounds for the rapid spread of infections. A single case of foodborne illness can quickly escalate into an outbreak that affects entire classrooms, schools, and surrounding communities, thereby placing additional strain on healthcare facilities and public health systems.

Beyond the immediate health and educational consequences, poor hygiene practices among adolescents have long-term implications for society. Habits formed during adolescence often persist into adulthood. If secondary school students are not adequately educated about safe food hygiene practices, they may carry poor habits into their families and communities later in life, perpetuating cycles of preventable illness and poor health outcomes. In Delta State, and particularly within Ethiope East Local Government Area, challenges relating to water supply, sanitation, and waste disposal exacerbate the food hygiene practices. Many schools have limited access to clean water, soap, and proper waste disposal facilities, thereby creating environments that encourage unsafe food hygiene practices. Given these realities, there is a clear need to investigate food hygiene practices among secondary school students in Ethiope East Local Government Area and their influence on health. By focusing on the students, rather than external factors such as food vendors, this study aims to identify the knowledge and specific hygienic practices that contribute to good or poor health outcomes. The findings are expected to provide valuable guidance for researchers, students, teachers, parents, and policymakers in promoting safer food hygiene practices, with the ultimate goal of improving student health, academic performance, and long-term well-being

Objectives

1. Assess the level of knowledge of food hygiene among secondary school students.

2. Assess food hygiene practices among secondary school students.

Research Questions

1. What is the level of knowledge of food hygiene among secondary students?

2. What are the food hygiene practices adopted by secondary school students?

Method

This study employed a descriptive survey research design to examine the influence of food hygiene practices on the health of secondary school students in Ethiope East Local Government Area of Delta State, Nigeria. The descriptive survey design was considered appropriate because it allows for the systematic collection of data from a defined population in order to describe existing conditions, behaviours, and relationships without manipulating any variables. It is particularly useful in studies that seek to understand opinions, attitudes, and practices as they naturally occur. In this context, the design enabled the researcher to gather relevant information from students about their food hygiene habits and how such practices affect their health outcomes. The study was conducted in Ethiope East Local Government Area, with its administrative headquarters in Isiokolo. The area comprises several communities, including Abraka, Isiokolo, Okpara Inland, and Okpara Waterside, and is notable for its concentration of educational institutions. The presence of markets, restaurants, food vendors, and school canteens exposes students to diverse food handling practices, making the area suitable for investigating issues related to food hygiene. The choice of this location was informed by its accessibility, the high population of students, and the likelihood of varied hygiene practices influencing students' health.

The population of the study consisted of approximately 1,200 senior secondary school students (SS1–SS3) drawn from both public and private schools in the area. These students were selected because they demonstrate a higher level of independence in their feeding habits and frequently obtain food from external sources such as vendors and canteens. Additionally, their level of cognitive maturity enables them to understand and respond accurately to research instruments, thereby ensuring the reliability of the data collected. A sample size of 300 students was selected to ensure adequate representation of the population. The study adopted a multistage sampling technique, beginning with stratification of schools into public and private categories to ensure balanced representation. Schools were then selected through balloting, giving each an equal chance of inclusion. Finally, students were proportionately selected from SS1, SS2, and SS3 classes to maintain balance across class levels.

Data for the study were collected using a self-structured questionnaire titled "Influence of Food Hygiene Practices on the Health of Secondary School Students Questionnaire (IFHPHSSQ)." The instrument was divided into two sections: demographic information and items measuring food hygiene practices and their influence on health. Responses were structured on a four-point Likert scale ranging from Strongly Agree to Strongly Disagree. To ensure validity, the questionnaire was subjected to expert review in the areas of Health Education and Measurement and Evaluation. Their feedback helped refine the instrument for clarity, relevance, and adequacy. Reliability was established using the test-retest method, where the instrument was administered twice to a group of students outside the study area, yielding a correlation coefficient of at least 0.70, indicating acceptable consistency. Data collection involved obtaining permission from school authorities and administering the questionnaire with the assistance of research aides. Respondents were assured of confidentiality, and completed questionnaires were collected immediately. Data analysis was conducted using descriptive statistics, specifically mean and standard deviation, with a benchmark mean score of 2.50 used as the criterion for decision-making.

Results

Demographic Data

Table 1: Frequency of Respondents by Genders

Gender	Frequency (F)	Percentage (%)
Male	131	44
Female	169	56
Total	**300**	**100**

Table 1 indicates that 131 respondents (44%) were male and 169 respondents (56%) were female, showing a higher representation of female respondents in the study.

Table 2: Mean score on the Knowledge of food hygiene practices

S/N	STATEMENT	SA	A	D	SD	Mean	Decision
5.	Washing hands before eating helps prevent diseases.	194	106	-	-	3.65	Agree
6	Eating uncovered food can cause illness	136	127	14	23	3.25	Agree
7.	Dirty food utensil can contaminate food.	167	133	-	-	3.56	Agree
8.	Improper food storage can lead to food spoilage.	129	171	-	-	3.43	Agree
9.	Consuming contaminated food can cause food poisoning.	193	107	-	-	3.64	Agree
10.	Food hygiene is important for maintaining good health	213	87	-	-	3.71	Agree
11.	Drinking clean water prevents food-related illnesses	185	110	4	1	3.60	Agree

Table 2 presents the mean scores on students' knowledge of food hygiene practices. The results show that all the items recorded mean scores above the 2.50 decision benchmark, indicating a high level of knowledge among the respondents. Specifically, respondents agreed that washing hands before eating prevents diseases ($\bar{x}$ = 3.65), eating uncovered food can cause illness ($\bar{x}$ = 3.25), dirty food utensils can contaminate food ($\bar{x}$ = 3.56), improper food storage leads to spoilage ($\bar{x}$ = 3.43), consuming contaminated food causes food poisoning ($\bar{x}$ = 3.64), food hygiene is important for maintaining good health ($\bar{x}$ = 3.71), and drinking clean water prevents food-related illnesses ($\bar{x}$ = 3.60). This implies that the respondents possess adequate knowledge of food hygiene practices

Table 3: Mean score on Food hygiene practices among students.

S/N	STATEMENT	SA	A	D	SD	Mean	Decision
12.	I wash my hands before eating meals	234	66	-	-	3.78	Agree
13.	I check food cleaniness before eating	121	137	25	17	3.21	Agree
14.	I avoid eating food that is exposed to flies or dust	146	150	2	3	3.46	Agree
15.	I wash fruits before eating them	137	152	8	3	3.41	Agree
16.	I ensure my eating utensils are clean before use	174	126	-	-	3.58	Agree
17.	I avoid sharing eating utensils with friends	84	102	65	49	2.74	Agree

Table 3 shows the mean scores on food hygiene practices among students. The results indicate that all the items recorded mean values above the 2.50 decision benchmark, showing that respondents generally practice good food hygiene. Students agreed that they wash their hands before eating meals ($\bar{x}$ = 3.78), check food cleanliness before eating ($\bar{x}$ = 3.21), avoid eating food exposed to flies or dust ($\bar{x}$ = 3.46), wash fruits before eating them ($\bar{x}$ = 3.41), and ensure that eating utensils are clean before use ($\bar{x}$ = 3.58). Although avoiding the sharing of eating utensils recorded the lowest mean score ($\bar{x}$ = 2.74), it was still above the benchmark. This suggests that students generally engage in positive food hygiene practices.

Discussion

The findings in Table 2 results show that students were very knowledgeable about food hygiene practices as mean scores exceeded the 2.50 mark on all items. Respondents concurred that washing hands prior to eating prevents diseases, eating uncovered food can result to illness, dirty utensils can contaminate food, improper storage results in spoilage, consumption of contaminated food causes food poisoning, food hygiene is vital in maintaining good health and drinking clean water prevents food related illness. This shows that there is a general knowledge among students on the important practices that should be applied in the handling of food that is safe and lessens the chances of contracting food borne diseases. These results are also similar to the results of Oluwafemi et al (2022), who have found that the secondary school students in Lagos State had a substantial level of knowledge regarding the hygienic practices, especially handwashing and safe food storage. On the same note, Awogbami et al (2024) have discovered that, students who frequently receive health education programs are more aware of the dangers of food contamination through improper storage and use of contaminated utensils. The elevated levels of knowledge could also be attributed to the successfully implemented school-based health education programmes and parental education about hygiene as it was observed by Musa et al (2021) that awareness about foodborne diseases in adolescents is mostly influenced by school-based educational interventions and consistent reminders at home. Additionally, the fact that the respondents are aware of the relevance of drinking clean water correlates with the results provided by Eze and Okafor (2026), who indicated that the students who have access to clean water and appropriate hygiene knowledge are more likely to appreciate the relationship between the quality of water, food safety, and general health. Together, these findings indicate that knowledge in itself is not a sufficient condition to have good hygiene practices, but rather it provides an essential basis on which good practices are instilled, and therefore, the importance of

formal education on one hand and awareness campaign on the other in providing students with the knowledge they need to avoid food-related diseases.

Further findings fron Table 3 analysis reveals that students are usually involved in positive food hygiene behaviors with all the items reported to have mean scores higher than the 2.50 mark, which shows a uniformity in the behaviors that are recommended. The students claimed they thoroughly wash their hands before eating food, inspect the cleanliness of food before eating, staying away of food that flies or dust touches, washing food before eating, keeping their eating utensils clean, and staying away of sharing eating utensils. These results imply that the students are not just knowledgeable of food hygiene, but they are also carrying out these practices in their daily activities, which is important in the prevention of foodborne diseases, as well as the overall well-being. This finding is consistent with the observations of Almansour et al (2016) who indicated that the levels of handwashing and safe handling of food among adolescents in secondary schools in Saudi Arabia were extremely high, which is an indication of the translation of knowledge to action. In a similar study, Mansour and Alfojery (2025) conducted a study on students of Egyptian secondary schools and found out that habitual food hygiene practices, including washing of fruits and checking their presence of contaminants were common and had a close relationship with previous school-based awareness campaigns. Moreover, the results are also similar to the study by Otto et al (2022), who found that Nigerian students who were exposed to hygiene education programs in schools were always consistent in relating to safe food practices, such as washing of utensils and avoiding sharing of eating tools. Moreover, the marginally reduced mean value on the avoiding the sharing of eating utensils (ustensils) ($\bar{x}$ = 2.74) indicates that although the overall hygienic behaviors are good, some of the behaviors are more difficult to sustain, a trend also observed in the study by Ngcongo and Tekere (2025) in South Africa, where peer pressure and cultural practices influenced some of the hygiene practices. This situation is consistent with Iwuno (2025), who emphasized that sustained behavioral change depends on inclusive support systems. It also reflects the observations of Obikeze et al (2022) on the role of social interactions in shaping health behaviors. All these findings reaffirm the value of not only teaching knowledge but also supporting practical behaviors through continuous learning, monitoring, and provision of resources, as supported by Chukwurah, Uzor et al (2020) and Obi et al (2026). The practices reported by the students indicate a commendable level of food hygiene, reflecting effective educational interventions and students' commitment to health.

Conclusion

The research found out that students in the secondary schools of Ethiope East Local Government Area of Delta State have a very high level of knowledge on food hygiene and generally have a positive hygiene behavior. The results show that students have knowledge of vital habits like handwashing, good food handling, safe drinking of water and clean utensils in avoiding food-related diseases. Moreover, the majority of students noted that they participated in proper hygiene behavior, which was a good transfer of knowledge to practice. Nevertheless, the research also found some loopholes in some of their practices especially in aspects like sharing of eating utensils, which still can be hazardous to their health. This implies that although knowledge is sufficient, there is the lack of full implementation of all hygiene practices. The paper, therefore, highlights the importance of the long-term health education, observation and reinforcement of good food hygiene practices among students in order to maintain better health and minimize exposure to food-borne diseases.

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