

## Assessment of Sanitary Condition of Food Outlets and Safety of Drinking Water by Students of UNN, IKERE Campus, EKITI State.

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### **Abstract**

*The level of hygiene of food gotten from food vendors and sanitation practices of food vendors and outlet operators can not be guaranteed. Also inadequacy or lack of water could lead students who live in and around campus to get water from any available source. Hence the need for the study. This study assessed the sanitary condition of food outlets and safety of drinking water by students of UNN, Ikere campus, Ekiti State. The survey design of the descriptive type of research was adopted. A sample size of 350 respondents was used for the study. The purposive and non-proportionate sampling techniques were adopted. The research instrument was a self structured close ended questionnaire. The response options were categorised into never, seldom, occasionally and always. Two hypotheses were formulated to guide the study. The data gathered from the administration of instrument were analysed using inferential statistics of Chi-square ( $\chi^2$ ) to test the hypotheses at 0.05, level of significance. The analysis was computed through the use of the 20.0 version of the Statistical Package for Social Sciences (SPSS) software. The findings of the study revealed that cholera was a health implication of sanitary condition of food outlets among students of University of Nigeria, Nsukka, Ikere campus. Also it was revealed that typhoid was a health implication of water supply among students of University of Nigeria, Nsukka, Ikere campus. From the findings of the study the researchers concluded that poor sanitation practices with respect to condition of food outlets and water supply in the institution have negative impact on the students' health. They therefore, recommended that there should be proper check on the operators of restaurants and food hygiene rating system should be introduced in our institutions of learning. Also management of tertiary institutions should give water supply within and around the campuses utmost consideration.*

**Key words:** *Assessment, Outlet, Hygiene, Borne, Disease*

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### **I. Introduction**

Delivering safe food to students on campus is the responsibility of food vendors. Food service operations are frequently identified as places where mishandling of foods have led to outbreaks of food-borne diseases such as cholera. Food-borne illnesses are a widespread public health problem globally. Developing countries bear the brunt of the problem due to the presence of a wide range of food-borne diseases. When eating outside, consumers expect to obtain quality food with an acceptable food hygiene level, which reduces the risk for food-borne illness (Djekic et al., 2014). The researchers observed that this is not the case with some food outlets in tertiary institutions and this is a source of concern. Uchegebu (2015) stated that most eating places such as hotels, bukas, restaurants and even mobile food sellers are sources of diseases.

Melese et al. (2018) stated that in urban centers in many countries, eating and drinking in food and drink establishments, like restaurants, hotels, cafeterias and snack houses, is common. "These establishments prepare, handle and serve large quantities of food and drink to large groups of people within a short period of time". Hence, unless sanitary and hygienic standard are seriously implemented, they will expose consumers to the risk of food-borne disease. Normandin (2017) stated that uncooked fruits, vegetables and other foods can contain the bacteria that cause cholera. World Health Organization (WHO, 2019) asserted that it takes between 12 hours and 5 days for a person to show symptoms of cholera after ingesting contaminated food or water. Cholera is caused by eating food or drinking water contaminated with a bacterium called *Vibrio cholerae*. The disease is most common in places with poor sanitation, crowding, war and famine (WebMD, 2019).

Diseases related to poor sanitation and water availability in the environment cause many people to die of sickness like cholera, diarrhoea, malaria, typhoid which damage the body tissues. The researchers observed

that students in the investigated area fall sick frequently. It is not clear on what could be the factors responsible for the challenge. It is believed that food sanitation, safety and the availability of clean and safe water in the hostels and academic areas could play a role or influence the health stability of students in the institution. Adane et al. (2018) stated that the repeated occurrence of food-borne diseases have led to an increase in global concern about food hygiene and safety among food outlets mostly in educational institutions. Food-borne disease outbreaks are often associated with poor personal hygiene of people handling food stuffs. Webb and Morancie (2014) observed that food safety is a constant public health concern supported by the fact that in both industrialized and developing countries, the rates of food-borne diseases are increasing and encompass a wide spectrum of illnesses. More so, it appears that most of the food outlets around the University environment do not meet the basic condition for food sanitation and safety.

Sanitation is one of the basic determinants of the quality of life and human development index. The concept of sanitation was earlier limited to disposal of human excreta and construction of lavatories. Today it includes personal hygiene, safe water, human excreta disposal, waste water disposal, solid waste disposal, food hygiene and environmental sanitation (in and around the school). WHO (2017) defined sanitation as the provision of facilities and services for the safe disposal of human urine and faeces. The word sanitation also refers to the maintenance of hygienic conditions, through services such as garbage collection and waste water disposal (Wilson, 2016). Fagbemiro et al. (2016) posited that sanitation should be as important as or even more important than water access in reducing disease transmission. Sanitation removes faecal matter, a chief reservoir of pathogen from the environment. It therefore facilitates maintaining a clean house and surroundings and if implemented well, can also prevent contamination of water sources.

Water is the alternative name of life and without water there will be no existence. Due to increase in the number of people in the world today there is an increase in demand for water and increase in occurrences of pollution of numerous water sources, environmental risks to humans and other living beings are enhanced. Water is a major need for life. It is very needful in the life of humans for survival. WHO (2019) stated that safe and readily available water is important for public health, whether it is used for drinking, domestic use, food production or recreational purposes. Improved water supply and sanitation and better management of water resources, can boost countries economic growth and can contribute greatly to poverty reduction. Water from contaminated sources cause numerous diseases and untimely deaths.

WHO (2019) also stated that contaminated water and poor sanitation are linked to transmission of diseases such as cholera, diarrhoea, dysentery, hepatitis A, typhoid and polio. That absent, inadequate or inappropriately managed water and sanitation services expose individuals to preventable health risks. The fact that a human needs water and cannot live without it forces him to use it even for drinking purposes, from any source, whether pure or contaminated. As a result, many people suffer or die from water-borne diseases such as typhoid. Dougan and Baker (2014) stated that typhoid is caused by a highly virulent and aggressive intestinal bacterium, which infects only humans and is usually acquired by ingestion of food or water contaminated by the faeces of patients with typhoid or asymptomatic carriers. Pietrangelo (2018) added that typhoid generally spread through contaminated water or food and it can also be passed through direct contact with an effected person.

Students in tertiary institutions need food and water for sustainability, good health and day to day activities, most especially in residential institutions. It is not all of them that cook and those that cook might not be opportuned to cook always. Therefore many of them depend on food from food vendors and outlets. The level of hygiene of such foods and sanitation practices of food vendors and outlet operators can not be guaranteed. Which means it is possible for students to contract food-borne disease most especially cholera from them. Also because of the high demand for water due to large population of students in the hostels, it becomes imperative for management of tertiary institutions to provide portable water in adequate supply for students. Inadequacy or lack of water could lead students to get water from any available source. Such water could be contaminated with typhoid causing bacteria (*Salmonella typhi*) and dangerous to their health. These are sources of concern because students of tertiary institutions are the future of any country.

Hence, every country has to take preventive measures to avoid pollution and contamination of the available water resources and food supply. Therefore, public water supply must be potable, palatable and wholesome. Water must not have disagreeable physical change and must be hygienically safe. Food as well must be sourced, processed, distributed and served under stringent hygienic and sanitary conditions. In order to prevent contamination which could lead to food-borne disease. The focus of this study is to assess the sanitation level of food outlets and water supply within the campus environment and what implications this have on the health of students who study and live in the school environment. It is expected that information unravelled by this effort will contribute to the management of health problems emanating from the environment as a result of associated sanitation practices obtainable in the institution.

## II. Research Objectives

The objectives of the study were to:

- 1) find out if cholera would be a health implication of sanitary condition of food outlets among students of University of Nigeria, Nsukka, Ikere campus;
- 2) find out if typhoid would be a health implication of water supply among students of University of Nigeria, Nsukka, Ikere Campus.

## III. Research Hypotheses

The following research hypotheses were tested at 0.05 level of significance.

- 1) There is no significant cholera as a health implication of sanitary condition of food outlets among students of University of Nigeria, Nsukka, Ikere Campus.
- 2) There is no significant typhoid as a health implication of water supply among students of University of Nigeria, Nsukka, Ikere Campus.

## IV. Methodology

Survey design of the descriptive type of research which is mainly concerned with describing and explaining events as they are without any manipulation of what is being observed was used for this study. This method was considered appropriate since the study was aimed at assessing the sanitary condition of food outlets and safety of drinking water by students. A sample size of three hundred and fifty (350) respondents was used. The purposive and non-proportionate sampling techniques were adopted. The seven hostels within the campus and four others from around the campus were purposively selected. Respondents were selected from the selected hostels using non-proportionate stratified sampling technique due to variation in the population of students in each hostel. The instrument for the study was a self structured close ended questionnaire. The questionnaire was made of two sections, the first, contained personal information of the respondents such as gender, age, level. While the second was used to gather information on the research variables of the study. The response options were categorised into never, seldom, occasionally and always. The face and content validation of the instrument was conducted by two experts in the field of health education for necessary input and amendment. The split-half method was used to ascertain the reliability of instrument. The validated instrument was administered to thirty (30) respondents from one of the hostels not selected for the study. The data collected were analysed using Cronbach's Alpha. The reliability coefficient obtained was subjected to further analysis with the use of Spearman Brown's formula to ascertain the value of (r) at 0.05 level of significance. The reliability coefficient obtained was 0.77. Inferential statistics of Chi-square ( $\chi^2$ ) was used to test the hypotheses at 0.05, level of significance. The analysis was computed through the use of Statistical Package for Social Sciences (SPSS) software version 20.0.

## V. Results

**Hypothesis 1:** There is no significant cholera as a health implication of sanitary condition of food outlets among students of University of Nigeria, Nsukka, Ikere Campus.

**Table 1:** Chi-square statistics on cholera as a health implication of sanitary condition of food outlets.

	Never		Seldom		Occasionally		Always		Chi-sq. ( $\chi^2$ )
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
Never	46	44.2	15	19.7	12	11.8	21	30.9	$\chi^2 = 21.282$
Seldom	24	23.1	17	22.4	27	26.5	16	23.5	df = 9
Occasionally	22	21.2	34	44.7	44	43.1	21	30.9	P = 0.011
Always	12	11.5	10	13.2	19	18.6	10	14.7	

**P<0.05 (Significant)**

The result of analysis presented in table 1 revealed that Chi-square ( $\chi^2$ ) calculated value (21.282; degree of freedom (df) = 9; P = 0.011). Since P is less than 0.05, the hypothesis was rejected. This indicated that cholera was a health implication of sanitary condition of food outlets among students of University of Nigeria, Nsukka, Ikere campus.

**Hypothesis 2:** There is no significant typhoid as a health implication of water supply among students of University of Nigeria, Nsukka, Ikere Campus.

**Table 2:** Chi-square statistics on typhoid as a health implication of water supply.

	Never		Seldom		Occasionally		Always		Chi-sq. ( $\chi^2$ )
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
Never	8	19.5	16	20.5	26	18.3	27	30.3	$\chi^2 = 152.69$
Seldom	9	22	22	28.2	39	27.5	11	12.4	df = 16
Occasionally	8	19.5	26	33.3	30	35.2	32	36.0	P = 0.001
Always	16	39	14	17.9	27	19	19	21.3	

**P<0.05 (Significant)**

The result of analysis presented in table 2 revealed that Chi-square ( $\chi^2$ ) calculated value (152.69; degree of freedom (df) = 16; P = 0.001). Since P is less than 0.05, the hypothesis was rejected. This indicated that typhoid was a health implication of water supply among students of University of Nigeria, Nsukka, Ikere campus.

## VI. Discussion

Finding from hypothesis 1 revealed that cholera was a health implication of sanitary condition of food outlets among students of University of Nigeria, Nsukka, Ikere campus. The finding was in line with the assertion of Normandin (2017) that uncooked fruits, vegetables and other foods can contain the bacteria that cause cholera. The finding supported the assertion of WHO (2019) that it takes between 12 hours and 5 days for a person to show symptoms of cholera after ingesting contaminated food or water. The finding supported the assertion of WebMD (2019) that cholera is caused by eating food or drinking water contaminated with a bacterium called *Vibrio cholerae*. That the disease is most common in places with poor sanitation, crowding, war and famine. Uchegbu (2015) stated that most eating places such as hotels, bukas, restaurants and even mobile food sellers are sources of diseases. Most of these cooking, especially the open air cooking (bukas) are done in filthy environment. This places are sure sources for the generation and transmission of diseases such as faecal oral infection manifested in worms, typhoid, hepatitis and diarrhoea, the sources of the raw food cooked and the water served which mostly come from dug wells constitute serious health hazards. The finding also supported the assertion of Adane et al. (2018) that the repeated occurrence of food-borne diseases have led to an increase in global concern about food hygiene and safety among food outlets mostly in educational institutions. Food-borne disease outbreaks are often associated with poor personal hygiene of people handling food stuffs. Human handling errors have been responsible for most outbreak of food-borne illness. Delivering safe food to students on campus is the responsibility of food outlets operators. However, to ensure proper check on the operators of restaurants, food hygiene rating system should be introduced in our institution of learning.

Finding from hypothesis 2 revealed that typhoid was a health implication of water supply among students of University of Nigeria, Nsukka, Ikere campus. The finding supported the opinion of Dougan and Baker (2014) that typhoid is caused by a highly virulent and aggressive intestinal bacterium. Which infects only humans and is usually acquired by ingestion of food or water contaminated by the faeces of patients with typhoid or asymptomatic carriers. The finding also supported that of Pietrangelo (2018) that typhoid generally spread through contaminated water or food and it can also be passed through direct contact with an effected person. From the revelation of previous researchers it is clear that water is important to human sustenance. This makes it important that in quest for water by man hygiene should be considered as the quality of water used by man goes a long way to determine his health status and longevity. In ensuring good quality water supply, sanitation is paramount. Wilson (2016) submitted that sanitation refers to the maintenance of hygienic conditions, through services such as garbage collection and waste water disposal. Fagbemiro et al. (2016) posited that sanitation should be as important as or even more important than water access in reducing disease transmission. Sanitation removes faecal matter, a chief reservoir of pathogen from the environment. It therefore facilitates maintaining a clean house and surroundings and if implemented well, can also prevent contamination of water sources. In the light of this, it becomes necessary that for students' who reside in hostels in tertiary institutions to be free from water borne disease. The water supply to the students' should be of interest to the management of the institutions. Water should be supplied under strict hygienic conditions and water sanitation should be considered.

## VII. Conclusion

Based on the findings of the study, the following conclusion were drawn; sanitary conditions of food outlets have implication on students' health, poor sanitation practices with respect to condition of food outlets constitute serious health hazards to students such as cholera. Water supply also have implication on students' health, typhoid disease is caused by unsafe water supply and inadequate sanitation and hygiene. These will make it difficult, if not impossible for students to study and achieve their educational goals. Due to the onset of poor health as a result of food and water borne disease. The researchers therefore recommended that there should be proper check on the operators of restaurants and food hygiene rating system should be introduced in

our institutions of learning. Also management of tertiary institutions should give water supply within and around the campuses utmost consideration.

### References

- [1]. Adane, M., Teka, B., Gismu, Y., Halefom, G., & Ademe, M. (2018). Food hygiene and safety measures among food handlers in street food shops and food establishments of Dessie town, Ethiopia: A community-based cross-sectional study. *PLoS ONE* 13(5), 0196919. <https://doi.org/10.1371/journal.pone.0196919>
- [2]. Angelillo, I. F., Viggiani, N. M. A., Rizzo, L., & Bianco, A. (2000). Food handlers and food-borne diseases: knowledge, attitudes, and reported behaviour in Italy. *Journal of Food Protection*, 63, 381-385.
- [3]. Djekic, I., Smigic, N., Kalogianni, E. P., Rocha, A., Zamioudi, L., & Pacheco, R. (2014). Food hygiene practices in different food establishments. *Food Control*, 39 (34-40).
- [4]. Dougan, G., & Baker, S. (2014). Salmonella enteric serovar typhi and the pathogenesis of typhoid fever. *Annual Review of Microbiology*, 68(1), 317-336. Doi:10.1146/annrev-micro-091313-103739
- [5]. Fagbemiro, O. O., Ademuyiwa, I. Y., Soyemi, O. D., & Ojo, A. O. (2016). Factors determining sanitation information-seeking behaviour: A literature review. *Tropical Journal Medicine Research*, 19, 1-7.
- [6]. Iheke, J. (2010). Impact of worker's remittance on efficiency and welfare of rural smallholder arable crop in south eastern Nigeria. Unpublished PhD dissertation, Michael Okpara University of Agriculture, Umudike, Nigeria.
- [7]. Melese, A., Mekonnin, T., & Ashete, A. (2018). The sanitary conditions of food and drink establishments in Woldia town, Northeastern Ethiopia. *Ethiopian Journal of Health Development*, 32(2).
- [8]. Normandin, B. (2017). Cholera: cause, symptoms and diagnoses. <https://www.healthline.com/health/cholera>
- [9]. Pietrangelo, A. (2018). Typhoid: cause, symptoms and diagnoses. <https://www.healthline.com/health/typhoid#causes>
- [10]. Uchegbu, S. N. (2015). Environment, sanitation and health. University of Nigeria, Enugu Campus, Enugu, Nigeria.
- [11]. Webb, M., & Morancie, A. (2014). Food safety knowledge of foodservice workers at a university campus by education level, experience, and food safety training. *Food Control*, 50, 259-264. <http://dx.doi.org/10.1016/j.foodcont.2014.09.002>.
- [12]. WebMD (2019). Cholera: cause, symptoms, treatment and prevention. <https://www.webmd.com/a-to-z-guides/cholera-faq>
- [13]. Wilson, T. D. (2016). Recent trends in user studies: Action research and qualitative methods. *Information Research*, 5(3). <https://informationr.net/iv/5-3/paper76.html>.
- [14]. World Health Organization, (2017). Sanitation. <https://sanitationupdates.wordpress.com/tag/world-health-organization/>
- [15]. World Health Organization (2019a). Cholera. <https://www.who.int/news-room/fact-sheets/detail/cholera>
- [16]. World Health Organization, (2019b). Drinking-water. <https://E/water-supply-and-healthy.htm>.

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