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# Perceived Influence of Food Hygiene in the Prevention of Food-Borne Diseases among Secondary School Students in Ilorin Metropolis, Kwara State, Nigeria

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## Abstract
*This study investigated the perceived influence of food hygiene in the prevention of food-borne disease among secondary school students in Ilorin Metropolis, Kwara State, Nigeria. Food-borne disease is a pervasive problem caused by consumption of contaminated foods and drinks. The objectives of the study included determining whether good personal hygiene and safe food handling affect prevention of food-borne diseases. The study adopted descriptive research design of survey type for the study. The population of the study comprises all secondary school students in the Ilorin Metropolis. The researchers a structured questionnaire adequately validated by experts from department of Health Promotion and Environmental Health Education, and Department of Epidemiology and Community Health at the University of Ilorin, Nigeria. The reliability of the instrument was determined through test re-test method in which reliability coefficient of 0.79 was obtained. In all, two hypotheses were formulated and tested for the study. The data generated were analysed by parametric statistical method of chi-square ($x^2$) at 0.05 alpha level of significance. The finding from the study revealed that good personal hygiene had much influence in the prevention of food-borne diseases among secondary school students in the Ilorin Metropolis. In addition, safe food handling had greater influence in the prevention of food-borne diseases among secondary school students in the same metropolis. Based on the findings above, secondary school students perceived good personal hygiene and safe food handling as having much influence in the prevention of food-borne diseases. The study recommends that secondary school students ought to be advised to strictly adhere to good hygiene practices to prevent food-borne diseases. Secondary school students are also encouraged to be conscious of the food they buy and prepare at home to prevent food-borne diseases.*

## Introduction
Food-borne disease is a pervasive problem caused by consumption of contaminated food and drinks. More than 200 pathogens are associated with food-borne disease (Cleveland Clinic, 2010). Food hygiene is the conditions

and measures necessary to ensure the safety of food from production to consumption (World Health Organization (WHO), 2015). Food can become contaminated at any point during slaughtering or harvesting, processing, storage, distribution, transportation and preparation. Lack of adequate food hygiene can lead to food-borne diseases and death of the consumer (WHO, 2015).

Food hygiene is a subject of wide scope food hygiene ensure application of preparation and presentation of foods that are safe and that are of good quality. It covers not only the proper handling of many variety of foodstuff and drink but also all the utensils and apparatus used in the preparation, service and consumption (Ethiopia Public Health Training Institute & Ethiopia Ministry of Health, 2003). Kafertein (2003) and WHO (2012) also justified the above statement that food hygiene is concerned with the hygiene practices that prevent food poisoning. The five key principles of food hygiene, according to them, include preventing contamination of food by mixing chemicals spreading from people to pet and pests, separating raw and cooked foods, preventing contamination of cooked foods, cooking foods for the appropriate length of time and at the appropriate temperature to kill pathogens, storage of food at the proper temperature, and using safe water and raw materials.

The prevalence of food-borne illnesses in developing countries is intertwined with other economic and development issues, namely legislation, infrastructure and enforcement mechanisms. Specific examples include inadequacy of food safety law, laxity in regulatory enforcements and the lack of education for food handlers (Santos, Nogueira, Patarata & Mayan, 2008). The incidence of food and water-borne diseases is estimated at 3.3-4.1 episode per child annually in Africa; food and water-borne diarrhoeal diseases are estimated to cause between 45,000-700,000 deaths in Africa annually with many more sporadic cases going unrecorded (Santos et al., 2008). In most of the cases, salmonella, hepatitis, shigella, brucella, staphylococcus, aureus, campylobacter, rotavirus and enteric bacteria are identified (Dewaal & Rober, 2013).

According to Raufa et al. (2014) food-borne outbreaks caused by salmonella represent a major public health world-wide and developing countries are affected by a wide range of food-borne diseases. More recently, data collected for Pan-American Health Organization (PAWHO/WHO) on developing countries indicated that 9,180 food-borne outbreaks were reported for the years 1993-2010. From these outbreaks 69% were caused by bacteria and salmonella was the most frequent agent incriminated for 58.1% of the outbreaks (Franco, Landgraf, Destro & Gelli, 2003; Vieira, Perez, LoFoWang & Hald, 2012).

There are many indicators that point to the fact that the incidence of food-borne diseases are increasing globally and responsible for a substantial cause of morbidity and mortality worldwide. For industrialized countries in general, it has been estimated that up to one-third of the population suffer from one type of food-borne disease or another each year (WHO, 2003). It is widely accepted that many causes of food-borne diseases occur as result of improper food handling and preparation by consumers in their own kitchens, as shown in a review of studies from both Europe and North America (Kaferstein, 2003). There are number of factors which are likely to contribute to outbreaks of food-borne illnesses in the home and school, including a raw food supply that is frequently contaminated, a lack of awareness among the general public, mistakes in food handling and food preparation at home and the deliberate consumption of raw and undercooked foods of animal origin, often described as risky eating behaviour (Kafertein, 2003).

Raw foods including meat and poultry, raw eggs, fish and shellfish, fruits and vegetables should all be considered as potential entry sources of food-borne pathogens into the home (Scott, 2001). The most common clinical presentation of food-borne disease takes the form of gastrointestinal symptoms; however, such diseases can also have neurological, gynaecological, immunological and other symptoms (WHO, 2015). Coker, Isokpehi, Thomas, Amusi & Obi (2002) reported that food-borne disease is projected to remain one of the top ten isolated bacteria pathogens globally in 2020.

Food hygiene comprises of regular washing of hands including palms and backs of hand before preparing food and after, after handling refuse and waste materials, tying long hair while preparing and eating food, covering of food to prevent contamination, avoid coughing, sneezing and spitting over food (Food Standard Agency, 2015). North Devon Council (2015) asserted that dirt utensils and dishes should be washed in water and rinsed in water that is above $80^{0}$C or washed in the dishwasher on a suitable cycle, keeping the spare clothes and other personal items away from where food is cooked and prepared. Also, wounds should be covered by a waterproof wound strip or a bandage while preparing food. World Health Organization (2003) stated that only clean utensils and other equipment should be used for serving food, using of colour-coded chopping boards should be used to prevent cross-contamination of raw food and the dining tables should be cleaned and dry.

United States Department of Agriculture (2015) stated that safe food handling is a method of food hygiene which includes shopping, storage, preparation, thawing, cooking, serving, leftovers, refreezing and cold storage chart.

Shopping means purchase of refrigerated or frozen items after selecting the non-perishables. The perishable foods should be refrigerated within 1-2 hours when the temperature that is above 90°F (32°C) and the food such as meat and poultry should be wrapped securely to maintain quality and to prevent juice from getting onto other food.

School Policy and Advisory (2014) opined that regular washing of hands with warm water and soap for 20 seconds before and after handling food and the raw meat prevent food contamination. All animal foods should be cooked to at least 170°F to kill bacteria, parasites and viruses which cause food-borne illnesses and hot food should be held at 140°F (60°C) or warmer while cold food should be held at 40°F (4.4°C) or cooler (United States Food and Drug Administration, 2015).

## Statement of the problem

In many countries, the teaching of food hygiene was traditionally taught as a part of the home economics curriculum in schools. Recently, but in the teaching of home economics has largely disappeared from nay national education programmes and as such food hygiene is not taught. In addition, changes in family structure, changes in family meal practices and changes in women's roles in the home and workplace have resulted to breakdown in the transfer of information about safe food practices within the family. The researchers' observed that most of the secondary school girls are the one preparing food for their patients and the siblings without having full understanding of what food hygiene is all about. Regrettably, publications addressing, importance and benefits of food hygiene in preventing and are not adequate and accessible to people based on the researchers' knowledge and existing records. The researchers carried out this study on perceived influence of food hygiene on prevention of food-borne diseases among secondary school students to fill the research gap created by the problem stated above.

## Research hypotheses

The following research hypotheses were formulated and tested in the study;

i) Good personal hygiene will not be significantly perceived as influencing prevention of food-borne disease among secondary school students in Ilorin Metropolis, Kwara State.

ii) Safe food handling will not be significantly perceived as influencing prevention of food-borne disease among secondary school students in Ilorin Metropolis, Kwara State.

## Methodology

Descriptive research design of survey type was adopted for the study. The study population comprised all secondary school students in Ilorin Metropolis, Kwara State. A multi-stage sampling technique was used to select sample size of the respondents that participated in the study. In the first stage, stratified random sampling technique was used to classify metropolis into three local government with twenty (20) wards. The second stage of the sampling process involve the use of cluster sampling technique to group the existing secondary schools within the metropolis into private and public schools. The third stage of the sampling exercise employed proportionate sampling technique to select fifty percent (50%) of the existing 43 private and public secondary schools. In all, six hundred and forty five (645) health teachers purposively selected from the 35 sampled schools.

The researchers' structured questionnaire was the main instrument used for the study. The questionnaire were adequately validated by three experts from Department of Epidemiology and Community Health, and Health Promotion and Environmental Health Education in University of Ilorin. The research instrument was subjected to reliability testing with the use of test re-test method. The two set of data generated from administration of research instrument compared with the use of Pearson product moment correlation coefficient (PPMCC) statistical method. A reliability coefficient of 0.79 was obtained from the analysis of the data generated.

The researcher with the help of five trained research assistants administered a total of six hundred and forty five (645) questionnaire administration were analysed with the use of chi-square (x2) statistical method at 0.05 alpha level of significance.

## Result

**Hypothesis 1:** *Good personal hygiene will not be significantly perceived as influencing prevention of food-borne disease among secondary school students in Ilorin Metropolis, Kwara State.*

Table 1

*Shows chi-square ($x^2$) analysis of good personal hygiene perceived as influencing prevention of food-borne disease among secondary school students in Ilorin Metropolis*

| SN | ITEMS | SA | A | D | SD | ROW TOTAL | CAL. VALUE | DF | CRIT. VALUE | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Foods contamination and poisoning are common to food vendors or food handlers that lack good hand - washing practice | 43 (42) | 502 (526.33) | 65 (57.67) | 35 (19) | 645 | | | | |
| 2 | Food vendors and handlers need to always cover their cooked foods to prevent contamination and food poisoning or food-borne diseases | 60 (42) | 485 (526.33) | 78 (57.67) | 22 (19) | 645 | 68.28 | | 12.59 | Hypothesis Rejected |
| 3 | Food handlers and food vendors should always cover their mouths when coughing, sneezing as well as avoid indiscriminate spitting and defaecation | 23 (42) | 592 (526.33) | 30 (57.67) | 0 (19) | 645 | | 6 | | |
| | **Total** | **126** | **1579** | **173** | **57** | **1935** | | | | |

Table 1 shows calculated chi-square ($x^2$) of 68.28 against the critical value of 12.59 with degree of freedom of 6 to 0.05 alpha level of significance. Since the calculated value is greater than the critical value; the null hypothesis stated above is hereby rejected. This means that good personal hygiene was perceived as influencing prevention of food-borne disease among secondary school students in Ilorin Metropolis, Kwara State.

**Hypothesis 2:** *Safe food handling will not be significantly perceived as influencing prevention of food-borne disease among secondary school students in Ilorin Metropolis, Kwara State.*

Table 2

*Shows chi-square ($x^2$) analysis of safe food handling as perceived as influencing prevention of food-borne disease among secondary school students in Ilorin Metropolis*

| SN | ITEMS | SA | A | D | SD | ROW TOTAL | CAL. VALUE | DF | CRIT. VALUE | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Food handlers and vendors need to ensure adequate food preservation to prevent food poisoning and food -borne diseases | 105 (156.67) | 480 (418.33) | 50 (53.33) | 10 (16.67) | 645 | | | | |
| 2 | Food handlers and vendors should handle foods in such away as not to lose their nutritional values derivable from them | 210 (156.67) | 350 (418.33) | 65 (53.33) | 20 (16.67) | 645 | 63.26 | 6 | 12.59 | Hypothesis Rejected |
| 3 | Food-borne diseases can be prevented if food handlers and vendors take time to wash raw foods and cover cooked foods before the foods will be finally served | 155 (156.67) | 425 (418.33) | 45 (53.33) | 20 (16.67) | 645 | | | | |
| | **Total** | **470** | **1255** | **160** | **50** | **1935** | | | | |

Table 2 shows calculated chi-square ($x^2$) of 63.26 against the critical value of 12.59 with degree of freedom of 6 to 0.05 alpha level of significance. Since the calculated value is greater than the critical value; the null hypothesis stated above is hereby rejected. This means that safe food handling was perceived as influencing prevention of food-borne disease among secondary school students in Ilorin Metropolis, Kwara State.

## Discussion of findings

The findings from tested hypothesis one (1) revealed that good personal hygiene have greater influence on prevention of food-borne diseases among secondary school students in Ilorin Metropolis, Kwara State. This implies that food handlers/food vendors should wash their hands regularly before and after food preparation to prevent food-borne diseases. This finding agreed with the finding of food standard agency (2015) that food hygiene which comprised of regular hand washing before and after food preparation, after waste disposal, covering of foods to prevent contamination are all preventive measures against food poisoning or food-borne diseases.

The result of tested hypothesis two (2) shows that safe food handling have much influence on prevention of food-borne diseases among secondary school students in Ilorin Metropolis, Kwara State. This implies that discreet handling of food preparation and consumption prevent food-borne diseases. This finding is in line with the finding of United State Department of Agriculture (2015) that

safe food handling is a method of food hygiene that help in prevention of food-borne diseases and food poisoning through proper cooking of raw foods at a prescribed room temperature as well as discreet covering of foods to prevent contamination.

## Conclusion

Based on the findings from the analyses of the tested hypotheses the following conclusions were drawn:

i) Good personal hygiene was perceived as a significant influence on prevention of food-borne disease among secondary school students in Ilorin Metropolis. This implies that good hygiene practices such as regular washing of hands before preparing and before eating can prevent the occurrence food-borne illnesses.

ii) Safe food handling was perceived as a significant influence on prevention of food-borne disease among secondary school students in Ilorin Metropolis. It signifies that proper handling of raw foods can avert food-borne diseases.

## Recommendations

In view of the findings in this study, the following recommendations were made:

- Secondary school students are advised to strictly adhere to hygienic practices as this would save them from all diseases associated with poor hygiene.
- Secondary school students are encouraged to be conscious of the food they may wish to buy and when preparing food at home they should follow safe handling procedures.

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