# AN ASSESSEMENT OF FOOD HANDLERS IN A TERTIARY INSTITUTION IN NIGERIA

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**Abstract**

**Introduction:** Food borne disease has become one of the most widespread public health problems associated with food safety. Food handlers are important in the transmission of this disease. Therefore, there is need for food handlers to meet certain requirements in order to be certified fit to handle food and the first essential is to have a complete medical examination at the time of employment and periodically thereafter.

**Methods:** A descriptive cross sectional study aimed at medical assessment of food handlers operating in food establishments in Ahmadu Bello University, Zaria-Nigeria was undertaken between 1st June and 1st October, 2008 and the data were analysed using SPSSversion15.0.

**Results:** The results revealed the mean age of the food handlers as 36.4years (age range 14-75 years); male: female ratio of 1:5. Fourteen (12.8%) of the 109 food handlers had mild hypertension and 13.8% had Ascaris lumbriciodes in their stool; 29 (26.6%) had initial and 2 (1.8%) had periodic medical examination.10.1% had skin sepsis; 20.2% and 56.9% had dirty hair and nails respectively. 73(67.0%) of the food handlers had no protective wears (apron, head cover) and the small percentage (13.8 ) of those that had protective wears did not use them regularly; most of the wears were dirty. None of the food establishments showed a license of registration.

**Conclusion:** It was recommended that all stakeholders with the responsibility of ensuring food safety in the university to be proactive in terms of regular monitoring of the food establishments, massive health education of proprietors, food handlers and the public.

**Key words:** *Medical assessment, food handlers, Ahmadu Bello University, Nigeria*

## Introduction

Food handlers include those individuals employed directly in the production and preparation of foodstuffs, including the manufacturing, processing, catering, and hospitality and retail industries.

In many developing countries, inadequate practices and surveillance systems persist despite significant advances in the area of food safety (Marci et al., 2002; Rahul et al., 2007). Food-borne disease is an infectious illness contracted through the consumption of food or drink contaminated with pathogenic bacteria, toxins, viruses or parasites. It is an important public health problem in many countries and its incidence is on the increase globally (Cengiz et al., 2008; Wada-Kura et al., 2009) and the cost of food borne disease to the employer, individual and the society is enormous. In Nigeria the magnitude of the problem is unknown, as cases of

food-borne disease tend only to be reported where there are large outbreaks or where the consequences are so severe that individuals seek medical attention. However, the Food Standards Agency (FSA) and Health Protection Agency (HPA) estimate that in England and Wales in 2005 food-borne disease cost the economy just under £1.4 billion, with 765,000 cases recorded (FSA, 2006). According to the HPA, only 1 in 130 cases of food-borne disease are reported. Estimates suggest that infected food handlers cause between 4% and 33% of food borne disease outbreaks in the UK (Bonner et al., 2001; FSA, 2006).

Food handlers can be symptomatic or asymptomatic carriers of food-borne infections therefore; they have a major responsibility in the prevention of food related infections. Food handlers constitute an important segment of the society (Marci et al., 2002; Okojie et al., 2005) especially in the University community where a significant number of students and staff eat in food establishments because of their busy schedules. In some countries, Nigeria inclusive, public health code requires that food handlers undergo medical examination before they can be employed in food establishments (Musa & Akande, 2002; Tayfun et al., 2006). However, the content of medical examination varies and may include one or more of the following: physical examination, evaluation of immunization status, especially hepatitis A and enteric fever, pre-placement and periodic medical examination and laboratory examination of stool and urine of the food handlers. In view of the increasing population of students, staff and number of food service establishments in Ahmadu Bello University a descriptive cross sectional study designed to assess the medical profile (both physical and laboratory) of food handlers operating on the main campus of the university was conducted.

**Methodology**

One hundred and nine (109) of the 118 food handlers working in the 18 food establishments located at the main campus of Ahmadu Bello University were studied between 1st June and 1st October 2008. Structured interviewer-administered questionnaires were used to collect the data. The questionnaires were pretested among food handlers operating at the Kongo campus of the university and amended subsequently. A total of 118 questionnaires were administered (9 were incomplete) and information obtained included socio-demographic characteristics, Hepatitis A immunization status, pre-placement and periodic medical examination. Each food handler was physically examined to determine the degree of neatness/cleanliness of their hair, nails and skin, and scored on a 10 point scale as follows: excellent, good, fair and poor. Stool samples from each of the food handlers examined in the laboratory by direct smear and formol ether concentration methods as described by WHO (1991). The blood pressure was recorded with standard sphygmomanometers (mercury and digital types) using appropriate sizes of cuff. Measurements were taken after a 5 minutes rest by the same trained observer (the principal investigator) using the same machine throughout the study. The systolic blood pressure (SBP) was determined by the first appearance of Korotkoff sound (phase I) and diastolic blood pressure (DBP) was recorded at the point of the disappearance Korotkoff sound (phase V) in the case of mercury sphygmomanometer. After obtaining the blood pressure using the mercury sphygmomanometer, the second reading was obtained by digital BP machine and the average recorded. These measurements were repeated using the same machines for each of the food handlers on the 2nd consultation visit (when the food handlers were seen in the clinic by the principal investigator with their laboratory results).The food handlers were classified accordingly into those with normal, mild, moderate and severe hypertension in relation to their ages. Participant observation was used to inspect the food establishments,

The data were analysed using absolute numbers, percentages, range, mean and standard deviation as appropriate, using SPSS version 15.0 statistical software.

**Ethical consideration**

A written consent was obtained from the University ethical committee. Also the proprietors and the food handlers of the 18 food establishments gave consent after explaining to each the purpose of the study. Participation in the study was voluntary even though the proprietors were aware that such exercise is the only way the University licenses people that will be allowed to handle food in the university community. Confidentiality was taken seriously observed.

## Results

The mean age of the studied food handlers was 36.4 years with age range 14 – 75 years. A total of 109 food handlers studied, 18(16.5%) and 91(83.5%) were male and female respectively. More than half (55%) of the handlers were single and 49.5% of Hausa ethnic identity. About 63 % were Muslim and a significant percentage (44 %) had no formal education. None of the food handlers had received immunisation against hepatitis A (Table 1).

The majority of the food handlers (81.7%) had normal blood pressure for their ages and 12.8% had mild hypertension. A significant number (73.4%) did not have initial (pre-placement) medical examination before being employed as food handlers. Only a small percentage (1.8%) had periodic medical examination since they were employed as food handlers. About 10% had skin infections in the form of boils, fungal infection and dermatosis. The food handlers with dirty hair and nails were 20.2% and 56.9% respectively. 73 (66.9 %) do not use protective wears such as head cover and apron.

Ascaris lumbricoides was the most prevalent intestinal parasite (13.8%) found in the stool of the subjects followed by Ankylostoma duodenale (hook worm) (8.3%) and a small percentage (0.9%) had S.haematobium and S.mansoni. However, 76.1% were free of any parasites (Table 2). None of the food service establishments showed license to operate either from the university authority or Sabon Gari Local Government Area. All the food establishments used an average of 2- 3 hand towels for cleaning of hands by the food handlers and the customers.

Table 1: Socio-demographic characteristics of food handlers (n= 109)

| Variable | Number | Percentage |
|---|---|---|
| **Age (years)** | | |
| 11- 20 | 23 | 21.1 |
| 21- 30 | 30 | 27.5 |
| 31- 40 | 17 | 15.6 |
| 41- 50 | 19 | 17.4 |
| 51- 60 | 16 | 14.6 |
| 61- 70 | 3 | 2.7 |
| 71- 80 | 1 | 0.9 |
| **Sex** | | |
| Female | 91 | 83.5 |
| Male | 18 | 16.5 |
| **Marital status** | | |
| Single | 60 | 55.0 |
| Married | 35 | 32.0 |
| Divorced | 10 | 9.1 |
| Widow | 4 | 3.7 |
| **Ethnic group** | | |
| Hausa | 54 | 49.5 |
| Yoruba | 79 | 7.3 |
| Ibo | 7 | 6.4 |
| Other | 40 | 36.7 |
| **Religion** | | |
| Islam | 65 | 59.6 |
| Christianity | 44 | 40.4 |
| **Educational status** | | |
| No formal education | 48 | 44.0 |
| Primary | 29 | 26.6 |
| Secondary | 25 | 22.9 |
| Tertiary | 7 | 6.4 |
| **Hepatitis A immunisation** | | |
| Those that had | - | - |
| Those that did not | 109 | 100 |

Table 2: Assessed parameters of the food handlers (n = 109)

| Variable | Number | Percentage |
|---|---|---|
| **Blood pressure (mmHg)** | | |
| Normal | 89 | 81.7 |
| Mild hypertension | 14 | 12.8 |
| Moderate hypertension | 4 | 3.7 |
| Severe hypertension | 2 | 1.8 |
| **Initial medical exam of the food handlers** | | |
| Those that had | 29 | 26.6 |
| Those that did not have | 80 | 73.4 |
| **Periodic medical exam of the food handlers** | | |
| Those that had | 2 | 1.8 |
| Those that did not | 107 | 98.2 |
| **Condition of the skin of the food handlers** | | |
| Those with skin sepsis | 11 | 10.1 |
| Those without skin sepsis | 98 | 89.9 |
| **Condition of the hair of the food handlers** | | |
| Very dirty | 1 | 0.9 |
| Dirty | 22 | 20.2 |
| Fair | 1 | 0.9 |
| Neat | 78 | 71.6 |
| Very neat | 8 | 7.3 |
| **Condition of the nails of the food handlers** | | |
| Very dirty | 3 | 2.8 |
| Dirty | 62 | 56.9 |
| Fair | 2 | 1.8 |
| Neat | 38 | 34.9 |
| Very neat | 3 | 2.8 |
| Painted | 1 | 0.9 |
| **Protective wears used by the food handlers** | | |
| Had protective wears on | 21 | 19.2 |
| No protective wears | 73 | 66.9 |
| Have protective wears but not using them | 15 | 13.8 |
| **Parasites found in the stool/ urine of the food handlers** | | |
| *Ascaris Lumbricoides* | 15 | 13.8 |
| *Ankylosoma duodenale* | 9 | 8.3 |
| *S.mansoni* | 1 | 0.9 |
| *S.haematobium* | 1 | 0.9 |
| No parasite | 83 | 76.1 |

**Discussion** The age range of 14-75 years showed that people of different ages and marital status are engaged in the business. The fact that most of the food handlers are female indicates that the business is dominated by females. A research in Ilorin revealed similar finding (Musa & Akande, 2002). The findings also revealed that the business is not restricted to any particular ethnic group or religion. Level of education has important relation with knowledge and practice of food safety and hygiene of food handlers (Okojie et al., 2005 ). The significant percentage of the food handlers who did not have formal education is very likely to have poor knowledge of food safety and hygiene as shown by similar study (Okojie et al., 2005; Chukwuocha et al., 2009). Food handlers are at increased risk of

acquiring hepatitis A and their position in preparing food can make them sources of outbreak. Hepatitis A vaccine has proved to be cost effective measure in area where the disease is endemic (Marci et al., 2002 ).

The 18.0% of the food handlers found to be hypertensive (ranging from mild to severe) and were not aware of their condition. This could be a reflection of what is happening in the larger population of Nigerians whereby many people are walking around without knowing their blood pressure. The observation that a significant percentage of the food handlers did not undergo initial (pre-placement) medical examination is similar to the findings of a study in Benin (Okojie et al., 2005). World Health Organisation (WHO, 2000) stressed the need and the importance of medical examination of food handlers. However, some schools of thought are of the opinion that routine medical examination of food handlers is unnecessary and ineffective in the promotion of food safety (WHO, 1989; WHO, 2000). This is because the exercise is not only costly for the people involved; it does not prevent infection after the initial examination (WHO, 1989). A medical examination is nonetheless appropriate in investigating the outbreak of food borne disease or when a food handler reports ill. The very low proportion of the food handlers that had periodic medical examination may be attributed to ignorance on the part of the proprietors and food handlers, and lack of proper monitoring by the necessary bodies in the university.

Personal of the food handlers, food safety and hygiene are also important elements in the prevention of food borne disease. The conditions of the skin, nails and hair of the food handlers are also of paramount importance. Long, painted and dirty nails, unkempt and uncovered hair will serve as hiding places for micro-organisms that could contaminate food. Septic skin lesions could also serve as sources of bacteria such Staphylococcus aureus among others. The dirty wears of the food handlers could serve as culture media for the growth of microbes. The significant percentage of the food handlers that had their hair neatly done may be as a result of the importance that is usually attached to hair especially by female in Nigeria.

The presence of Ascaris lumbricoides, a faecal orally transmissible parasite may be indicative of a significant level of faecal contamination of the environment and low level of environmental sanitation. A study in Abeokuta showed the prevalence of Ascaris lumbricoides to be 54% among street food vendors (Idowu & Rowland, 2006). This higher figure may be as a result of the study population.

The selling of food by unregistered food establishments in the university is because of lack of proper supervision by the regulating bodies in the university.

The use of non-disposable hand towels by the customers and the food handlers can serve as route of transmission of micro-organisms from one person to the other and also contamination of food.

## Conclusion

The findings of the study have highlighted the need for creating awareness among food handlers about various measures of maintaining food hygiene and good health through pre-placement medical and in-service medical examinations.

The recommendations include review of the present policy of pre-employment medical examination of food handlers, routine medical examination as a prerequisite for registration or licensing of food handlers and establishments, periodic training programs for proprietors of food establishments, food handlers and the public to understand the basic principles of food safety and their own responsibility in that respect.

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