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Profile and Knowledge of Food Hygiene and Safety of Food Handlers in a University Campus

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Food handlers constitute an important factor in food borne diseases and their improper handling of food and non-observance of food hygiene may result in food contamination and its attendant consequences. This study was designed to elicit the socio-demographic and professional characteristics, and basic knowledge on food hygiene of food handlers working in food establishments in Ahmadu Bello University, Samaru Zaria. A descriptive, cross sectional study was carried out between 1st June and 1st October, 2008.Out of the total 130 food handlers operating in the 18 food establishments on the campus, 109 randomly selected respondents were interviewed using structured questionnaires administered during the investigation. Majority were female (83%), 68% were within the age brackets of 14-45years; 60%were Muslim; and Hausa 50%. Forty eight (44%) out of the 109 food handlers had no formal education. Only 27 % had pre-placement and in-service medical examination; 6 % had ever attended training on food hygiene since employed. The study also revealed a poor knowledge (mean score of 3.54) of food hygiene and safety, and this is statistically related to the educational attainment of the food handlers ($p < 0.05$). It is recommended that a massive health education campaign be directed at both the public and food handlers be embarked on, to enable people take necessary steps to prevent food borne diseases.

Key words: Socio-demographic Characteristics, Food handlers, Food hygiene, Food safety, University Campus, Nigeria.

Food related infection is an important health problem in many countries and with the increase in urbanization, industrialization, tourism and mass catering systems, food borne diseases are on the increase throughout the world (Cengiz *et al.,* 2008). Food handlers may be infectious but have no symptoms of illness; and the infections which are likely to be transmitted by them are diarrhoea, dysenteries, typhoid and paratyphoid fevers, entero-viruses, viral hepatitis, protozoal cysts, eggs of helminths, streptococcal and staphylococcal infections, and salmonellosis among others.

Food handlers have requirements to fulfil in order to handle food. The first essential is to have complete medical examination carried out on all food handlers at the time of employment (Tayfun *et al.,* 2006).

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Aspects of personal hygiene involve the hands, hair, use of clean overall and good habits, clean environment, among others. Avoidance as far as practicable hand contact with food, keeping perishable food in appropriate temperature; protection of food from contaminating insects, dust and animals; discarding all food and food products which are not hygienically sound; ensuring the cleanliness and adequate disinfection of all equipment that come into direct contact with food, and maintenance of food premises in a sanitary manner at all times. Education of food handlers in matters of personal hygiene, food handling, utensils, dish washing, and insect or rodent control is also essential in the promotion of food hygiene. Persons with wounds, otitis media or skin infections should not be permitted to handle food or utensils.

A Study to evaluate food hygiene knowledge showed that majority of the studied food handlers (47.8%) had not taken basic food safety training and a significant number often have lack of knowledge regarding the basic food hygiene and many have little educational background (Murat *et al.,* 2006).

Rahul *et al.,* (2007) in a similar Study showed 60.3% of the food handlers to be less than 40years,97.4% were males,80.1% were literates and 94.7% had one or more morbid conditions such as dental caries, worm infestation, injuries/ burns on the hands. The health seeking behaviour, immunization status and pre-placement and in-service medical examination were unsatisfactory (Rahul *et al.,* 2007).While a Survey by Cengiz *et al*. (2008) indicated that the main way of preventing or decreasing bad food handling practices is by educating food handlers and repeating this training periodically, in addition to inspection (Cengiz *et al.,* 2008).

The increasing population of Students and Staff; and the increasing number of food service establishments in Ahmadu Bello University, Samaru Zaria, Nigeria has necessitated a descriptive cross-sectional Study with the objectives to find out the socio-demographic characteristics and knowledge of food hygiene and safety of the food handlers. The data will also serve as a baseline for regular monitoring, evaluation and an intervention.

MATERIAL AND METHODS

Study Area

Ahmadu Bello University, Zaria, a first generation University was officially opened in 1962 and it has turned out to be the largest and the most extensive of all Universities in Sub-Saharan Africa. It covers a land area of about 7000 hectares. Today, the student population is about 35,000, the majority of them undergraduates but with a sizeable and growing number of postgraduate students. The main Campus of the university is located at Samaru, Zaria. It is home to 12 faculties, 8 research Institutes and Centres, a Postgraduate School, a Division of Agriculture Colleges, a School of Basic and Preliminary Studies affiliated to it, a Demonstration Secondary School and a Primary School and Extensions and Consultancy Services (ABU handbook, 2006). The population has been increasing and more food establishment have been on the increase.

Study design

The study is a cross sectional descriptive survey to assess knowledge of food hygiene and safety, socio-demographic characteristics of 109 randomly selected food handlers working in the 18 food service establishments located within Ahmadu Bello University, Samaru Zaria, Nigeria. It was carried out between 1st June and 1st October, 2008.

Sampling Instrument

An interviewer-administered questionnaire was administered on the food handlers. The questionnaire composed of two parts; the first part established the socio-demographic characteristics of the respondents while the second part dealt with knowledge of food hygiene and safety. Four researchers were used in the data collection, after having been trained for standardization. The knowledge questions on food hygiene, food safety and food borne diseases were scored; each correct response gave one point, partial correct response gave ½ point, while incorrect or don't know responses gave no point. The maximum score obtainable was 10 points. Scoring was as follows: A=9-10, B=7-8, C=5-6, D=3-4, E=0-2. These questions included; what is food, food hygiene, the importance of food hygiene and training for food

handlers, vehicles for contamination of food, examples of diseases transmitted through food, proper storage of food, importance of medical examination and morbid condition of food handlers, among others. English and Hausa were the languages used for the interview depending on which the respondent understands.

A pilot study was carried out at Kongo campus of Ahmadu Bello University, Zaria to pre-test the questionnaire.

Data Analysis

Data were analyzed using SPSS version 15.0 statistical software package. Mean, range, percentages and cross tabulation were used to describe quantitative and qualitative data. Microsoft excels and word in window 2003 was used for graphics and tables. Chi square test was used to test for significance of associations. A p-value of less than 0.05 was considered significant.

RESULTS AND DISCUSSION

Majority of the respondents (60%) were aged < 45years, Hausa constituted 50%, Islam 60% and 44% had no formal education. This may be related to the general characteristics of the population of people residing in the environment. These social characteristics were similar to the findings of the study by Rahul *et al.* (2006) but the sex distribution was different where male constituted 94%. In this study male were 17% of the respondents. The difference may be as a result of the general believe here that food handling is a female job, and the low level of education of the food handlers may be due to conception that the job is also meant for those seeking alternative job or managing before they get admission into institutions. The religion is very important because of ensuring that there is no disruption in the supply of food by the food handlers during fasting period.

Of the 109 respondents, 29(26.6%) had screening before they started handling food, 9(8.3%) had attended training on food hygiene procedures, and 6(5.5%) have attended seminar on food hygiene while working as food handlers. However, the seminar was only once, not regular and not extensive. There is statistical significance between the positive professional characteristics

Table 1. Age by sex distribution

Age(yrs)	Number	%
11-17	10	9.1
18-24	19	17.4
25-31	21	19.2
32-38	12	11
39-45	12	11
46-52	17	15.5
53-59	3	2.7
60-66	13	11.9
67-73	1	0.9
74-80	1	0.9
Total	109	100

X2=51.04 df=38 p value=0.077 mean age=36.4 range=14-75 m/f 18:91

Table 2. Cross tabulation of education verse training, screening and seminar attendance

Factors considered	No formal education n= 48	Primary n= 29	Secondary n= 25	Tertiary n= 7	X^2 value	Significance
Training						
Yes	0	0	5	4	X^2=33.56	Significant
No	48	29	20	3	p <0.00	
Screening						
Yes	19	1	7	2	X^2=12.14	Significant
No	29	28	18	5	p <0.007	
Seminar attendance						
Yes	2	0	2	2	X^2=9.314	Significant
No	46	29	23	5	p <0.025	

Table 3. Cross tabulation Education verse Food Hygiene Knowledge Score

		Knowledge Score									Total
		1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	
Education	No formal education	14	15	9	10	0	0	0	0	0	48
	Primary	2	6	13	7	1	0	0	0	0	29
	Secondary	0	0	1	4	7	12	1	0	0	25
	Tertiary	0	0	0	0	1	0	0	3	3	7
Total		16	21	23	21	9	12	1	3	3	109

X^2=185.24 df=24 P-value=0.00

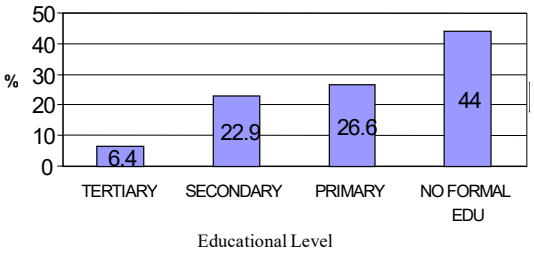

Fig. 1. Educational Level of the Respondents

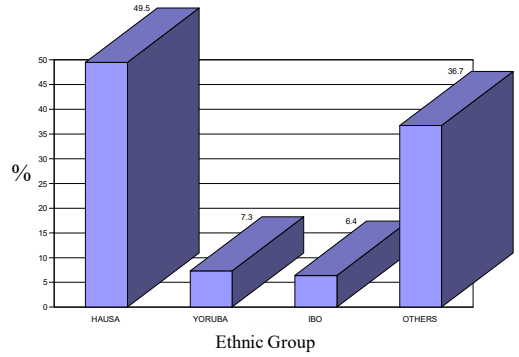

Fig. 2. Ethnic Group of the Respondents

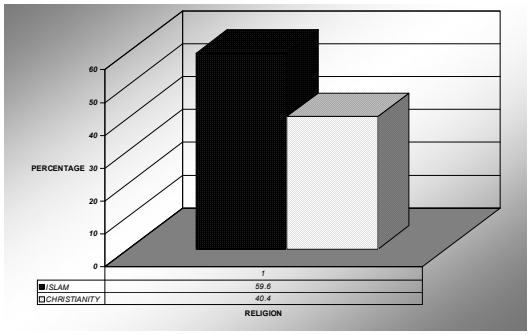

Fig. 3. Religion of the Respondents

and the educational attainment of the respondents ($p<0.05$).Those with tertiary educational attainment showed positive professional characteristics compared to those with lower or no formal education. None of the respondents had immunisation against hepatitis B and or enteric fever.

The mean overall knowledge score of food hygiene and safety was 3.54 on a scale of 10 points. However, the score is higher among those who that had tertiary, followed by those with secondary education(X^2 =1.85, p-value=0.00, minimum-=1, maximum=9). The knowledge was not uniformly spread among the respondents. The higher the level of education of the food handler the higher the knowledge scored in the areas of food hygiene, food safety, attendance of training, seminar, and undergoing screening before employment. These findings are similar with the results of the studies by Okojie *et al.* (2005) and Angelillo *et al.* (2000) which revealed poor knowledge of food hygiene by the studied food handlers in Benin, Nigeria; 30.4% had pre-employment medical examination before being employed and 48% had received or attended a form of health education training. A Study by Murat *et al.* (2007) showed 47.8% to have had basic food safety training. Surveys by Cengiz *et al.* (2008) and Egan *et al.* (2007) revealed similar results with the need for training and improvement on food hygiene by food handlers. Tayfun *et al.* (2006) and Yousef and Ranjbar (2005) also stressed the need for improvement in correct evaluation procedures of food handlers to make the periodic examination more effective.

CONCLUSION

This study showed that majority of the food handlers within the campus were female, and are within the age bracket of 14-45 years. Only small percentage had tertiary education and these were the ones that good knowledge of food hygiene and safety. A good number of the handlers did not have any medical examination before employment, and have never attended seminar on food hygiene and safety.

Recommendations

1. Massive health education campaigns directed at both the public and food handlers to enable people take necessary steps to prevent food borne diseases.
2. Mandatory medical evaluation of food handlers before they are employed to handle food.
3. Organising periodic training for food handlers and proprietors of food establishments.
4. Collaboration between the relevant stakeholders to work as a team in monitoring of food establishments on campus and issuance of licence to food vendors.
5. Surveillance and research on prevention of food borne diseases recorded on campus.
6. Issuance of ID card to food handlers that have met the requirement to handle food for easy fishing out of those ones not fit.
7. More regular inspection of food establishments on campus by the relevant stakeholders
8. There is need to carry out a study that has to do with the physical and laboratory medical examination of all the food handlers on campus in order to assess their morbid condition.

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