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**PERCEPTION OF POST GRADUATE DIPLOMA IN EDUCATION STUDENTS ON
FOOD SAFETY AMONG FOOD HANDLERS IN FAST FOOD RESTAURANTS IN
ZARIA**

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**PERCEPTION OF POST GRADUATE DIPLOMA IN EDUCATION STUDENTS ON
FOOD SAFETY AMONG FOOD HANDLERS IN FAST FOOD RESTAURANTS IN
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Abstract

The study investigated postgraduate diploma in education students' perception of food safety and personal hygiene practice of food handlers in fast food restaurants in Zaria. A descriptive study of six sections scale questionnaire was used. A total of 188 questionnaires were distributed during this study to the post graduate diploma in education students at National Teachers' Institute, Kaduna. Among the distributed questionnaires, 151 were correctly filled, retrieved, and analyzed. Sixty-seven respondents (44%) were male while 84 (56%) were females. Forty-seven respondents (31%) did not patronize any of the restaurants. Among factors influencing choice of restaurants are closeness to residence, price of food and quality of food were the most important factors 49 (32%). Twenty-four (16%) eat in restaurants because of the similarity of the food to home food. Of the most preferred food, Fried rice, 25 (17%) top the list, next was pounded yam, 24 (16%) and Jollof rice, 19 (13%). Amala 2 (1%) and Fufu 0 (0%) were the least food preferred. A total of 93 (62%) respondents believed handlers kept short nails, 53 (35%) do not pick nose, 80 (53%) stated that food handlers do not cough or sneeze while handling food. Seventy-nine respondents (53%) also stated that serving of food with unprotected hands were not observed. The result of this study showed that although food handlers are aware of the need for personal hygiene, more awareness needs to be created.

Introduction

Food safety is a public concern. It is very important for all food handlers to have better understanding about the food safety procedures and potential factor that may cause food borne illness. Insufficient food safety practices are major contributors to the transmission of food borne illness. Food is a product that is rich in nutrients required by microorganisms and may be exposed to contamination with the major sources from water, air, dust, equipment, sewage, insects, rodents, and employees. Due to the changes in food production, handling and preparation techniques as well as eating habits, the fact remains that food is the source for microorganisms that can cause illness (Siow and Norrakiah, 2011). Food handler includes any person who is directly involved in the preparation of food, encounters food and food contact surface; and handles packages and unpackaged food or appliance (Food Hygiene Regulation, 2009). Diseases spread through food remain a common and persistent problem resulting in appreciable morbidity and

occasional mortality. Food handlers play an important role in ensuring food safety throughout the chain of production, processing, storage, and preparation (Zain and Naing, 2002). According to Bryan (1988) and Mederios *et al.*, (2001), the common food handling mistakes besides serving contaminated raw food also includes inadequate cooking, heating, or re-heating of food consumption of food from unsafe sources, cooling food inappropriately and allowing too much of a time lapse.

Food borne illness of microbial origin are a major international health problem associated to food safety and an important cause of death in developing countries (WHO, 2002). The incidence of food borne diseases is rising in developing countries, as well as in the developed world (Jevsnik *et al.*, 2008). Although their global incidence is difficult to estimate, it has been reported that in 2000 alone 2.1 million people died of diarrheal diseases. A great proportion of these cases can be attributed to contamination of food and drinking water (WHO, 2009). In response to the increasing number of foods borne illnesses, governments all over the world are intensifying their efforts to improve food safety. (WHO, 2009) Food safety is defined as the degree of confidence that food will not cause harm to the consumer when it is prepared, served, and eaten according to its intended use. (FAO/WHO, 2003).

Objective of the Study

To investigate perception of postgraduate diploma in education regarding food safety and personal hygiene practice of food handlers in fast food restaurants in Zaria.

Research Questions

This study was guided with the following research questions.

1. Do postgraduate diploma in education students patronize fast food restaurants in Zaria?
2. What are the factors influencing their choice of fast-food restaurants?
3. Do food handlers in these fast-food restaurants comply with personal hygiene and food safety practices?
4. Do postgraduate diploma in education students' have knowledge on food safety and food borne diseases?

Research Methodology

A descriptive study was conducted in which a structured and modified questionnaire was peer viewed and had undergone pilot study using 10 postgraduate diplomas in education students to establish the validity, reliability, and clarity of the questions. The final corrected version was then distributed to all the students. To guarantee anonymity of responses and easy identification of questionnaires by respondents, identity numbers was randomly assigned to each questionnaire. Each questionnaire took approximately 15 minute to complete.

All postgraduate diploma in education students at National Teachers' Institute Kaduna were recruited for this study. Sampling was carried out using random sampling technique. Due to the inadequacy of the questionnaire to be administered round the population of the students' understudy, the researcher found it necessary to adopt a method with 'Yes' or 'No' were written and squeezed on small papers for the students to pick one whoever picked 'No' was not given the questionnaire to fill, but those who picked 'Yes' were given the questionnaire to fill.

The instrument used by the researcher to source information for this research work was a structured, self-administered questionnaire designed to get relevant information or response from the students. The questions were divided into six sections with focus on the stated research objectives. Section A contained socio demographic data of the student. It contained 5 questions on gender, age group, academic level, marital status, and religion. Section B contained 6 scale questions relating to restaurants patronage among the students. Information on hygiene state of the restaurant's environment was contained in section C of the questionnaire. It contained 5 questions. Section D consists of 9 questions on food handlers' personal hygiene and practices. In addition, questions on knowledge of food borne disease and safety awareness among students was contained in section E while the last section (Section F) was on awareness and practice of food safety and hygiene among the students. Frequencies as well as the percentages of responses in each section was computed.

Results

Socio demographic information of the students.

The table below shows the socio demographic information of the students.

Table 1: Socio demographic information (n=151)

Variables	Response	Frequency (n)	Percentage (%)
Gender	Male	67	44
	Female	84	56
Age group	<20	0	0
	21-30	66	44
	31-40	79	52
	41-50	6	4
	>50	0	0
Academic level	Higher National Diploma	51	34
	Degree	73	48
	Masters	22	15
	Doctorate	0	0
Marital status	Single	62	41
	Married	88	58
	Divorced	1	1
	Widowed	0	0
Religion	Christianity	83	55
	Islam	68	45
	Others	0	0

Of the 188 questionnaires distributed among the postgraduate diploma in education students, only 151 were correctly filled, retrieved, and analyzed. Sixty-seven (44%) were male while 84 (56%) were females. A total of 51 (34%) were Higher National Diploma holders, 73 (48%) were degree holders, 22 (15%) were masters holders and none 0 (0%) were doctorate degree holders. The average age of the students was 31-40. The religion of 68 (45%) respondents were Islam while 83 (55%) were of Christianity (Table 1).

Research Question 1: Do postgraduate diploma in education students patronize fast food restaurants in Zaria?

Table 2

Patronage of restaurants (n=151)

Variables	Response	Frequency (n)	Percentage (%)
Eats in restaurant	Yes	104	69
	No	47	31
Preferred restaurant	Mr. Biggs	20	13
	Chicken republic	10	7
	Al-Nasiha restaurant	9	6
	Tulips	1	1
	Village Kitchen	11	7
	Frizzlers restaurant	5	4
	Shagalinku restaurant	9	6
	Daula restaurant	0	0
	Others	39	26
How often do you eat in restaurants?	Every day	5	3
	Once in 2 days	6	4
	Weekly	12	8
	Fortnightly	0	0
	Occasionally	81	54
Factors influencing choice of restaurant	Closeness to my residence/ institution	8	5
	Price of food	2	1
	Quality and safety of food	21	4
	Similarity with home food	24	16
	Combination of closeness to residence/ institution, price, quality, and safety of food	49	32
Preferred food	Fried rice	25	17
	Jollof Rice	19	13
	Amala	2	1
	Semovita	6	4
	Pounded yam	24	16
	Tuwon Shinkafa	13	9
	Fufu	0	0
	Fried potatoes	5	3
	Others	10	7
Reason for preferred food	Safer and more hygienic	16	11
	Prepared only when demanded	21	14
	Ready to eat	9	6
	Take away	13	9
	Others	45	30

A total of 104 (69%) of all the respondents patronized Mr. Biggs, Chicken republic, Al- nasiha restaurant, Tulips, Village kitchen, Frizzlers, or Shagalinku restaurant (Table 2). However, 47 (31%) did not patronize any restaurant. Mr. Biggs patronage 20 (13%) was high among respondents. Tulip's restaurants was the least patronized and Daula restaurant was not patronized at all. Nine (6%) postgraduate diploma in education students patronized Shagalinku and Village kitchen 11 (7%) restaurants respectively. On the frequency of patronage, 12 (8%) eat in restaurants on weekly basis, 5 (3%) eat every day in the restaurants and 81 (54%) eat in a restaurant occasionally. None 0 (0%) eat forth nightly in restaurants. Six (4%) eat once in two days. Among factors influencing choice of restaurants, closeness to residence/ institution, price of food and quality of food, 49 (32%), were the most important factors. Twenty-four (16%) eat in restaurants because of the similarity of the food to that of their home food. Of the most preferred food, fried

rice, 25 (17%) top the list, next was pounded yam, 24 (6%), then 19 (13%) jollof rice, 49 (32%) tuwon shikafa, 13 (9%), semovita, 6 (4%), fried potatoes, 5 (3%) and others 10(7%). Amala was the least food preferred 2 (1%) while fufu was not patronized at all 0(0%). The reasons for preferred food were asked among the respondents. Safer and hygienic food 16 (11%) was the most important factor. Twenty-one (14%) preferred food prepared only when demanded, 13 (9%) preferred to take away, 9 (6%) preferred ready to eat food and others 45(30%).

Research Question 2: What are the factors influencing their choice of fast-food restaurants?

Table 3

Information on the hygiene state of the restaurant’s environment (n=151)

Variable	Response	Frequency (n)	Percentage (%)
Closeness to rubbish/ refuse dump	Strongly agree	0	0
	Agree	19	30
	Strongly disagree	52	34
	Disagree	33	22
Provision hand washing facilities	Strongly agree	24	16
	Agree	22	15
	Strongly disagree	2	1
	Disagree	16	11
Presence of rodents, cats and insects in the restaurant environment	Strongly agree	5	3
	Agree	16	11
	Strongly disagree	52	34
	Disagree	31	21
Waste bin provided	Strongly agree	37	25
	Agree	59	39
	Strongly disagree	0	0
	Disagree	8	5
Neatly kept toilets available	Strongly agree	44	29
	Agree	52	34
	Strongly disagree	0	0
	Disagree	8	5

Five questions were used to access response on the hygiene state of restaurants environment. Fifty-two (34%) strongly disagreed and 33 (22%) disagreed that the restaurants were close to refuse dump (Table 3). Nineteen (30%) agreed and none 0 (0%) strongly agreed that hand washing facilities were provided while less than half 52 (34%) of the respondents strongly disagreed that there was presence of rodents, cats, and insects around the restaurants. Likewise, 37 (25%) strongly agreed and 59 (39%) agreed that waste bins are provided. Restaurant’s restrooms were kept neat as strongly agreed by 44 (29%) and agreed by 52 (34%).

Research Question 3: Do food handlers in these fast-food restaurants comply with personal hygiene and food safety practices?

Table 4:

Food handlers' personal hygiene and practice (n=151)

Variable	Response	Frequency (n)	Percentage (%)
Kept short nails	Strongly agree	22	15
	Agree	71	47
	Strongly disagree	0	0
	Disagree	11	7
Pick nose	Strongly agree	19	13
	Agree	32	21
	Strongly disagree	49	32
	Disagree	4	3
Coughing and sneezing when handling food	Strongly agree	11	7
	Agree	13	9
	Strongly disagree	60	40
	Disagree	20	13
Dishing, serving and tasting food with unprotected hands	Strongly agree	15	10
	Agree	10	7
	Strongly disagree	31	21
	Disagree	48	32
Smoking	Strongly agree	5	3
	Agree	2	1
	Strongly disagree	62	41
	Disagree	35	23
Use of apron	Strongly agree	15	10
	Agree	68	45
	Strongly disagree	0	0
	Disagree	21	14
Spitting around restaurant premises	Strongly agree	10	7
	Agree	25	17
	Strongly disagree	38	25
	Disagree	31	23
Wearing of accessories like ring and bracelets	Strongly agree	10	7
	Agree	61	40
	Strongly disagree	13	9
	Disagree	20	13
Food handlers always appear neat	Strongly agree	39	26
	Agree	52	34
	Strongly disagree	5	3
	Disagree	8	5

Keeping short fingernails, picking nose, coughing or sneezing when handling food, using unprotected hands to serve and dish food, smoking, use of apron, spitting around restaurants environment, wearing rings and bracelets and physical appearance were questions used to assess personal hygiene and practice of food handlers. A total of 93(62%) respondents believed handlers kept short nails, 53 (35%) do not pick nose, and 80 (55%) stated that food handlers do not cough or sneeze while handling food (Table 4). 79 (53%) also stated that serving food with unprotected hands were not observed. However, regarding the use of apron, 83 (55%) believed they have once seen handlers with aprons. Sixty-nine (45%) also stated that there was no spitting around food premises by food handlers. A total of 71(47%) observed wearing of accessories like ring and bracelets by food handlers and 91 (60%) agreed that handlers always appear neat.

Research Question 4: Do postgraduate diploma in education students' have knowledge on food safety and food borne diseases?

Table 5:

Awareness about food borne diseases among postgraduate diploma in education students (n=151)

Variable	Response	Frequency (n)	Percentage (%)
Food borne disease is illness acquired from the consumption of food contaminated by either microorganisms or toxins	Strongly agree	71	47
	Agree	80	53
	Strongly disagree	0	0
	Disagree	0	0
Food borne disease is preventable	Strongly agree	80	53
	Agree	71	47
	Strongly disagree	0	0
	Disagree	0	0
Poor food handler's hygiene practices, unsafe raw food and inadequate cooking can cause outbreak of food borne disease	Strongly agree	92	61
	Agree	59	39
	Strongly disagree	0	0
	Disagree	0	0

In this section of the questionnaire, four questions were used to assess knowledge and awareness of the students on food borne diseases. A total of 151(100%) respondents were aware that food-borne diseases as illness acquired because of consuming food contaminated with microbes or toxins (Table 5). A total of 151 (100%) respondents believed the diseases can be prevented while 151 (100%) perceived that poor hygiene of food handlers, unsafe raw food and inadequate cooking of food can cause outbreaks of food borne diseases and illnesses.

Table 6

Awareness, practice of food safety and hygiene among postgraduate diploma in education students (n=151)

Variable	Response	Frequency(n)	Percentage (%)
Have knowledge on food safety and hygiene	Strongly agree	51	34
	Agree	95	63
	Strongly disagree	0	0
	Disagree	5	3
Wash hands before and after eating	Strongly agree	86	57
	Agree	55	37
	Strongly disagree	0	0
	Disagree	10	7
Wash hands before and after cooking	Strongly agree	86	57
	Agree	50	33
	Strongly disagree	0	0
	Disagree	15	10
Wash hands with soap and water after going to the toilet	Strongly agree	86	57
	Agree	50	33
	Strongly disagree	0	0
	Disagree	15	10
Pick nose and wipe face with unwashed hands	Strongly agree	16	11
	Agree	29	19
	Strongly disagree	81	54
	Disagree	25	17
Aware of World Health Organization (WHO)'s five keys to safer food	Strongly agree	51	34
	Agree	75	50
	Strongly disagree	10	7
	Disagree	15	10

A total of 146 (97%) of the respondents have knowledge on food safety and hygiene (Table 6). A total of 141 (94%) respondents washed hands before and after eating. A total of 136 (90%) respondents washed hands before and after cooking while 136 (90%) washed hands with soap and water after going to toilet. One hundred and six (71%) respondents usually do not pick nose and wipe face with unwashed hands and 126 (74%) of the respondents are aware of World Health Organizations' five keys to safer food.

Discussion

Zaria as a town is a Centre for learning within Kaduna state. It has various institutions of learning which includes National Teachers' Institute in Zaria, Kaduna state which runs the post graduate diploma in education programme. It attracts different people of different culture from different places. Therefore, adjustment to culture and custom of the host community (Zaria) constitute one of the major challenges of postgraduate diploma in education students. Adapting to different types of food, methods of food preparation serve as factors in considering eating food in restaurants or self -prepare. While some students can still cook themselves despite busy academic schedule and nature of the programme, some prefer eating in restaurants. Handlers of food in restaurants have been described as the most crucial factor during food production, preparation, processing, and storage (Okojie *et al.*, 2005). Many cases of food borne disease has been reported in Nigeria. Food borne disease is usually attributed to poor hygiene state of restaurants, poor food hygiene, inadequate cleanliness while preparing and serving food and food handlers' personal hygiene. Health authorities and other concerned governmental agencies should issue "warning letters" to some restaurant's operators due to poor environmental sanitation (Hazrina *et al.*, 2012). Siow and Norakiah, 2011, stated that food is a perishable product although rich in micronutrients required for growth by humans, animals, and microorganisms. Food

can easily be contaminated via water (polluted), air (airborne microbes), processing equipment, rodents, insects, and food handlers. It could be observed in this study that majority of the respondents eat in restaurants. Eating contaminated food can thereby result in food borne diseases. In a recent study in 2011 on the assessment of food safety knowledge, attitude, and practice among food handlers in the National University of Malaysia residential hostels restaurants, respondents (food handlers) only showed positive attitudes towards food handling and not to both their personal hygiene and food handling. A food handler as defined by Anant and Anjali (2011) is someone who regardless of either he or she prepares, serve food or not but handles food. Personal hygiene of food handlers is very important because contact of food with any exposed part of their body such as unprotected hands, skin, clothing, or body accessories can contaminate the food being handled. High level of personal hygiene and practice observed among food handlers will help prevent outbreak and spread of infectious food borne diseases. Various researchers have stated that maintenance of personal hygiene among handlers of food coupled with clean environment where food and related products are being produced and sold are important players in prevention of food borne diseases outbreak. Inappropriate handling of food-by-food handlers serve as breeding ground for pathogens to grow and increase to disease causing numbers if consumed contaminated (Zain and Naing, 2002; FAO, 2001). Hand washing is simplest of all personal hygiene measures to ensure safe food among handlers (Niffenegger, 1997). It was reported that hand washing is one of the most efficient and effective ways of reducing spread of food borne pathogens due to its ability to reduce gastrointestinal disease by 12 – 40 % and 20 % of other infections especially when combined with soap hence hand washing constitutes the most important factor in food safety among both food producers, handlers, and consumers (Curtis and Cairncross, 2003).

Conclusion

The result of this study showed that although food handlers are aware of the need for personal hygiene, more awareness needs to be created. More so, food premises need to be kept neat always, refuse or waste should be disposed as soon as possible while rodents, cats and insects should be prevented from getting into the dining area in the restaurants or where food is being prepared so as not to contaminate raw food materials.

Recommendations

Continuous on the job training on personal hygiene is recommended for food handlers. In addition, postgraduate diploma in education students in various institutions including National Teachers' Institute learning should be given more awareness on food safety and hygiene to prevent outbreak and spread of food -borne diseases not only in Zaria but also in other towns and states within Nigeria in case if the students travelled home. Educational leaflet on the practice of food safety and hygiene should be provided to postgraduate diploma in education students during orientation of new students in National Teachers' Institute. Health authorities and other concerned governmental agencies should issue "warning letters" to some restaurant's operators due to poor environmental sanitation so that they can sanitize their environment when due.

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