Food Science and Quality Management
ISSN 2224-6088 (Paper) ISSN 2225-0557 (Online)
Vol.29, 2014

Household Food Safety Awareness of Female University Workers in South East Nigeria

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Abstract
This study is aimed at exploring the awareness of household food safety among female University workers in South East Nigeria. Specifically the study identified the food safety knowledge, attitude/ perception to food safety issues, food purchasing, food handling and preparation practices among female university workers and ways of improving household food safety practices. The descriptive survey design was employed. A structured questionnaire was used to collect data from a sample of four hundred and ninety female university workers obtained from a total population of two thousand four hundred and fifty females working in the five federal universities in the south east zone of Nigeria. Frequency and mean were used to analyze the data obtained from the questionnaire. The study revealed that the female university workers have some adequate knowledge about food safety practices. However, more than half of the respondents were not aware of the role of temperature control as a means of reducing the risk of food borne illnesses. It is suggested that public health education program be designed to enhance household safety awareness.
Keywords: Food Safety, Household, Awareness, Female University Workers.

1. Introduction

Food is said to be safe or wholesome if it is free not only from toxins, chemical and physical contaminants but also from microbial pathogens such as bacteria, parasites and viruses. Contaminations of food otherwise known as food poisoning lead to many human diseases and affect the body's proper function. Food contamination/poisoning are chiefly caused by harmful bacteria like Campylobacter, Salmonellas and Escherichia Coli (E. Coli) responsible for most food related illnesses, hospitalization and death (Eley, 1996).Campylobacter, is the most common bacterial cause of diarrhea, and can be caused by undercooked chicken or other food contaminated with juices that drip from raw chicken. Salmonella is a bacterium that can spread from food of animal origin. Symptoms include fever, diarrhea, abdominal cramps which can become serious in some individuals. E coli are a bacterium that resides in cattle and similar animals. Humans usually infected from consuming food or water that has been contaminated with small amount of cow waste. Most other causes of food poisoning from bacteria include viruses, parasites, toxins and all food contaminants. Some serious long term effects associated with several common types of food poisoning include kidney failure, chronic arthritis, brain nerve damage and death. All are at risk but certain groups of people are more susceptible and suffer serious consequences from food borne diseases like pregnant women, older adults, children and persons with chronic diseases. WHO (1999), revealed that each year1.8 million people all over the world including women and children die as a result of diarrhea attributed to contaminated food and water. Food-borne diarrhea remains one of the most common illnesses of children and one of the major causes of infant and children mortality in developing countries. However, the adverse effects which exist by consumption of contaminated foods can only be controlled with food safety practices. Forgetting about food safety is a recipe for disaster.

Food safety is a term describing handling, preparation and storage of food in ways that prevent food borne illnesses. These include according to Food Safety Services (FSS, 2009) a number of routines that should be followed to avoid severe health hazards. Vanguard (2005), disclosed that food safety is the utilization of various resources and strategies to ensure that all types of foods are properly stored, prepared, and preserved so they are safe for consumption. Practicing this level of food sanitation include the proper storage of leftovers for future use. According to World Health Organization (2000), food safety is the degree of confidence that food will not cause sickness or harm to the consumers when it is prepared, served and eaten according to its intended use.

Food safety awareness is important to all that handle and eat food. It is therefore the responsibility of government, food industries and consumers who prepare and eat food in their homes to employ measures to keep food safe. In Nigeria, food safety are monitored by agencies such as the National Agency for food and Drug Administration and Control (NAFDAC), the Standards Organization of Nigeria, the National Primary Healthcare Development Agency and some International Agencies like Food and Agricultural Organization (FAO), World Health Organization (WHO) among others. These agencies, among other responsibilities, establish standards and codes of hygienic practices for food and food products, formulate national policies on food safety, and control food borne diseases as well as other national and international matters relating to food.

The national food safety system in Africa highlighted some constraints hindering the proper implementation of

the food agency policies as inadequate and uncoordinated food hygiene and safety control system, inadequate infrastructural facilities for enforcement and emergency response, insufficient financial provisions which contributed to the present situation of inadequate food, poor hygiene, questionable food safety, and food security in the country. Different levels for regulation of food safety have been identified as Global, National, Industrial and Household (FSS, 2009).These represent the levels at which food safety can be controlled. This study will however concentrate on household food safety.

Household food safety is that part of food safety which individuals can monitor and control within the home. Presently, there is no regulation for the preparation, handling, and storage of food in homes hence household food safety is controlled through the education of women. It is very important that females, in this case female university workers who have the primary responsibilities of purchasing, storage and preparation of food in the home should be well informed about the possible health hazards presented in the food they consume. Awareness therefore has to do with people's knowledge and behavior relating to household food safety. These include food handling practices, purchasing behavior, with respect to food safety and food safety knowledge.

Unsafe food practices is an important cause of reduced economic productivity, pain, suffering, increased medical bills costs, income loss (due to absence from work) and reduced individual productivity (WHO, 1999). Food handling practices are presently of public concern, and action is required to reduce the likelihood of home-derived food borne diseases. Since females are generally in charge of food/feeding in the home, what are the food handling practices of female university workers in south east Nigeria?

The outbreak of food borne illnesses are primarily the result of unsafe food practices, therefore female university workers should be made to view wrong practices as direct threat to health. They should take particular note of food safety of infants and young children who are particularly vulnerable to food safety threat. Food handling practices like cooking food to appropriate temperature in order to kill microorganisms, maintaining the right temperature for freezing, hygienic handling of foods, separation of raw and cooked foods; purchasing of food from clean places and access to clean water would contribute greatly to ensuring food safety in the home.

Food is the major source of human exposure to pathogenic agents, from which no individual is spared. Thousands of people die every year as a result of food poisoning and hospitals are filled with more patients suffering from food and water borne diseases than from other causes of illness.

1.1Research Questions

The following research questions guided the study.

1. What is the food safety knowledge of female university workers in South East Nigeria?
2. What are the attitude/perception/ of female university workers to food safety issues?
3. What are the food purchasing practices of female university workers in south east?
4. What are the food handling and preparation practices of female university workers?
5. In what ways can household food safety practices of the female university workers be improved?

2. Research Method

The study adopted the descriptive survey research design because it used structured questions given to a representative sample of respondents to measure their opinions, beliefs, values or tendency to act (Ezeh, 1999). The study, therefore as a descriptive survey sought to obtain and describe food handling practices of female university workers in South East Nigeria.

The sample consists of 490 female university workers drawn from a population of 2450 female university workers in the South East. The sampling represented 20% of the population. Disproportionate stratified random sampling technique was used to get representative sample from all the five federal universities in the South East.

Eighty five (85) item structured questionnaire was used to elicit responses from respondents for answering the research questions. Questionnaire items 1-15 were structured with Strongly Agree (SA), Agree (A), Strongly Disagree (SD) and Disagree (D) response options to elicit responses for answering research question one, items 16-27 were designed also with Strongly Agree (SA), Agree (A), Strongly Disagree (SD) and Disagree (D) to elicit responses for answering research question two, items 28 -40 were designed with the same response options and 2.50 cutoff point to elicit responses for answering research question three, while items 41-64 and items 65-85 were structured with options Always (AL), Often (OF), Occasionally (OC) and Never (NE) for answering research question four and five respectively. Limit of real number was used to interpret the responses. Response range 4.00 -3.00 represent AL, 2.99 – 2.00 represents OF, 1.99 – 1.00 represent OC, 0.99 – 0.00 stands for NE.

A total of 490 copies of the questionnaire were distributed by the researchers and the same copies of distributed questionnaire were collected back, with the help of two research assistants. Ten respondents were randomly interviewed, guided by the questionnaire items, to provide qualitative data.

Frequencies and Mean (X) were used to anaĪyze the data collected.

3. Results of the study

The results of data analysis are presented and interpreted according to the research questions guiding the study.

Research Question One

What is the food safety knowledge of female university workers in South East Nigeria?

Table 1: Food safety knowledge of female university workers

S/N	ITEM	SA	A	SD	D	$\bar{X}$	Remarks
1	It is ok to thaw meat on the counter	210	214	38	28	3.26	Agree
2	Clearing kitchen with bleach kills bacteria	191	204	48	47	3.11	Agree
3	I don't need to wash fruits or vegetables if am going to peel them	98	178	150	70	2.61	Agree
4	Left over are safe to eat until they smell bad	94	216	80	100	2.61	Agree
5	Food borne illnesses are minor and temporary	85	205	70	130	2.58	Agree
6	Washing meat, poultry and sea food will rid them of bacteria	60	100	245	85	2.28	Disagree
7	Washing fruits and veggies with detergents will rid them of contaminants.	85	225	90	90	2.61	Agree
8	Thawing or marinating food on the kitchen counter is ok	180	130	85	95	2.83	Agree
9	Diarrhea, stomach pains, typhoid fever, vomiting are symptoms of food borne diseases,	235	155	30	70	3.13	Agree
10	Refrigerate perishable food immediately (not more than an hour.	50	110	255	75	2.28	Disagree
11	Infants and young children are more vulnerable to food safety threats	92	178	150	70	2.61	Agree
12	Cooking destroys food nutrients and should be discouraged	200	110	90	90	2.83	Agree
13	Food must be stored under freezing temperature	85	120	190	95	2.40	Disagree
14	Cooked food must be kept away from raw food	225	180	40	45	3.18	Agree
15	Raw eggs are healthy and very nutritious	85	205	25	53	3.17	Agree

Table 1 shows the mean response of the respondents on food safety knowledge of female university workers. The respondents agreed positively on items 1,2,3,4,5,7,8,9,11,12,14,15, and 16 respectively since where their mean score were higher than the 2.50 cutoff points. They however disagree to items 6, 10, and 13 as depicted by the mean scores of less than 2.50.

Research Question Two

What are the attitude/perception/ of female university workers to food safety issues?

Table 2: Attitude/perception of female university workers to food safety issues

S/N	ITEM	SA	A	SD	D	$\bar{X}$	Remarks
16	Report food borne illness to chemist instead of medical doctor for treatment and advice.	60	155	195	80	2.41	Disagree
17	Untreated water tank or pond should be considered very bad source for drinking water	325	145	10	10	3.60	Agree
18	Consumers have a right to insist on safe food.	230	175	30	55	3.18	Agree
19	Egg is better consumed raw.	20	55	270	145	1.90	Disagree
20	It is impossible to avoid risks associated with food safety.	80	125	200	85	2.40	Disagree
21	Everything we eat these days are dangerous	20	70	250	150	1.92	Disagree
22	I try not to think how safe or unsafe a food is.	35	50	210	195	1.85	Disagree
23	There is little or nothing one can do about food safety.	15	55	265	155	1.86	Disagree
24	I trust the government to take necessary action to ensure safe food supply.	190	120	85	95	2.83	Agree
25	I eat meat/chicken/fish/akara balls or any food that is exposed at road side	0	30	1.15	345	1.36	Disagree
26	Spoilt food items should be properly disposed	225	200	50	15	3.30	Agree
27	There is need to always consider the safety of food for storage	260	215	10	5	3.49	Agree

Table 2: shows the mean responses of respondents to attitude/perception of female university workers on food safety issues.

The respondents answered positively on the issues represented by items 17, 18, 24, 26, and 27,due to fact that their mean response was higher than 2.50. Whereas they disagreed with the issues represented by items 16, 19, 20, 21, 22, 23 and 25 were their mean scores were less than the cutoff point of 2.50.

Research Question Three

What are the food purchasing practices of female university workers in south east?

Table 3: Food purchasing practices of female university workers

S/N	ITEM	SA	A	SD	D	$\overline{X}$	Remarks
28	Food purchasing is an important preliminary step in ensuring a safe food supply within the home.	195	260	15	20	3.29	Agree
29	Consider market environment where food items are displayed and sold.	220	185	50	35	3.20	Agree
30	Check the cleanliness of seller before purchasing food.	240	225	15	10	3.42	Agree
31	Purchase food stuffs based on its quality instead of quantity.	365	100	10	15	3.66	Agree
32	Check expiring date of food items before purchasing	395	65	20	10	3.72	Agree
33	Patronize ready-to-eat foods that are not exposed to flies, dust.	245	190	30	25	3.34	Agree
34	Check for foul odour and discolouration prior to purchase	265	195	15	15	3.45	Agree
35	Do not purchase frozen fish/chickens/meat thawed at ambient/room temperature.	95	195	100	100	2.58	Agree
36	Reject any food when in doubt of the safety.	260	195	10	25	3.40	Agree
37	Discontinue buying certain food items because of food safety concerns.	95	175	155	65	2.61	Agree
38	Buy foods that are in good condition (tomatoes, pepper)	305	170	5	10	3.57	Agree
39	Purchase ready to eat food that are not exposed (bread, plantain etc)	195	200	50	45	3.11	Agree
40	Food can be bought from anywhere since it will be cooked	210	195	10	75	3.18	Agree

Table 3: shows the mean response of respondents to food purchasing practices. They responded positively to all the items from items 28 to 40 since the mean scores were above the cutoff point of 2.50.

Research Question Four

What are the food handling and preparation practices of female university workers?

Table 4: Food handling and preparation practices

S/N	ITEM	AL	OF	OCC	NE	$\overline{X}$	Remarks
41	Prepare or wash foods with dirty or used water.	15	5	15	455	1.14	Occasionally
42	Use the same cutting board for meat/chicken/fish etc.	40	55	235	160	1.95	Occasionally
43	Eat groundnut, garden egg, or any food without washing hands.	0	5	100	385	1.22	Occasionally
44	Allow food to cool and thaw at room temperature	10	40	135	305	1.50	Occasionally
45	Allow 2 hours between preparation and eating of food.	80	110	195	105	2.20	Often
46	Preserve food with chemicals	60	130	150	150	2.20	Often
47	Allow sick person(s) to prepare food.	15	15	120	340	1.40	Occasionally
48	Taste or dish out food with hand.	20	30	90	350	1.43	Occasionally
49	Expose prepared foods and cooking utensils	5	20	105	360	1.33	Occasionally
50	Cooking or cooling food inadequately	25	65	155	245	1.73	Occasionally
51	Sneezing or coughing while preparing and serving food.	0	25	110	355	1.33	Occasionally
52	Touching hair, face, nose when preparing food	0	60	100	330	1.45	Occasionally
53	Serving food on the same plate that previously held raw meat, fish without washing it.	5	15	30	440	1.15	Occasionally
54	Irregular check of refrigerator temperature	60	70	170	190	2.00	Often
55	Irregular washing of hands especially during food preparation.	70	30	140	250	1.84	Occasionally
56	Ensure proper food handling	245	230	0	15	3.44	Always
77	Search for and make use of information on food labels.	225	202	40	20	3.30	Always
58	Patronize ready-to-eat foods dispensers with utensils instead of hands.	215	195	30	50	3.17	Always
59	Food items should be well preserved especially against cockroaches, rodent, insects etc.	375	95	20	0	3.72	Always
60	Defrost food on kitchen counter	80	230	90	90	2.61	Often
61	Clean all utensils before using them to cook.	365	120	5	0	3.73	Always
62	Keep wash-up areas clean to avoid growth of microorganism	310	175	5	0	3.62	Always
63	Wash foods (including fruits and vegetables) before preparation and eating.	400	80	5	5	3.78	Always
64	Reheat leftover foods to appropriate temperature before serving.	205	230	20	35	3.23	Always

Table 4: shows the mean response of respondents to food purchasing practices of female university workers. They responded occasionally to issues raised in items 41, 42, 43, 44, 47, 48, 49, 50, 51, 52 and 55. They claimed

often to the issues in items 45, 46, 54, 60. To items 56, 57, 58, 59, 61, 62, 63, and 64 their response was Always, as deduced from the limit of real numbers.

Research Questions Five

In what ways can household food safety practices of the female university workers be improved?

Table 5: Ways of improving household food safety practices

S/N	ITEM	AL	OF	OCC	NE	$\overline{X}$	Remarks
65	Pay attention to expiry date during food purchase	445	20	15	10	3.84	Always
66	Eat foods soon after preparation	255	85	115	35	3.14	Always
67	Cooling food inside refrigerator with shallow containers.	140	75	155	120	2.48	Often
68	Not exposing prepared food to flies.	280	35	10	165	2.88	Often
69	Buy quality food stuffs from clean shops.	410	45	25	10	3.74	Always
70	Washing hands with water and soap especially after touching raw meat, fish, chicken.	400	30	45	15	3.66	Always
71	Avoid use of the same working surface and equipment/utensils for both raw and cooked food.	40	275	65	110	2.68	Often
72	Ensuring regular check up for refrigerator temperature.	70	145	105	170	2.58	Often
73	Ensuring that food is not exposed to personal sweat, sneezing and coughing.	370	30	30	60	3.45	Always
74	Washing plate with uncontaminated clean water.	350	45	10	85	3.35	Always
75	Cook foods including meat until well done.	400	25	45	20	3.64	Always
76	Thaw frozen foods inside refrigerator, microwave or running water.	190	95	95	110	2.74	Often
77	Do not prepare food when sick or have sick persons prepare food.	205	60	125	100	2.76	Often
78	Eat food in hygienically clean environment.	425	40	15	10	3.80	Always
79	Seek for information concerning food safety from health professional or health magazines and newspapers.	275	70	105	40	3.18	Always
80	Wash hands with water and soap immediately after touching meat/fish in the market or anywhere.	180	205	55	50	3.05	Always
81	Read articles on food safety practices	215	210	40	25	3.26	Always
82	Separate raw food from ready-to-eat or cooked food	40	235	25	190	2.23	Often
83	Wash hand with soap after using the toilet.	360	115	5	10	3.68	Always
84	Assess to clean water will help ensure food safety	460	5	10	15	3.84	Always
85	Tasting food to see if it is still good should be discouraged	120	95	175	100	2.48	Often

Table 5: shows the mean response of respondents to ways of improving household food safety practices. They gave positive responses to all items, specifically Always to items 65, 66,69, 70, 73, 74, 75, 78, 79, 80, 81,83, and 84 and Often to items 67, 68, 71, 72, 76, 77, 82 and 85.

4. Discussion of the findings

Food is the major source of human exposure to pathogenic agents, from which no individual is spared. Thousands of people die every year as a result of food poisoning and hospitals are filled with more patients suffering from food and water borne diseases than from other causes of illness.

Although female university workers generally seem to have fair knowledge on household food safety issues, due probably to level of education, majority still have adequate knowledge about household food safety procedures. This can be seen from their mean ratings, purchasing preferences, food handling, preparation and preservation practices adopted in the home.

They agreed amongst many, that it is ok to thaw meat on the kitchen counter without realizing that harmful germs can multiply extremely rapidly at room temperature. Food therefore should be thawed safely in the refrigerator or in cold water or in the microwave.

Don't need to wash, fruits and veggies before peeling is wrong because it is easy to transfer bacteria from the peel or rind you are cutting to the inside of your fruits or vegetables. Leftovers are safe to eat until they smell bad is wrong because the kind of bacteria that cause food poisoning do not affect the look, smell or taste of food. The possibility of bacteria growth actually increases after cooking. The drop in temperature allows bacteria to thrive thus it is critical to warm cooked food to the right temperature before eating. Heat leftover thoroughly to at least 165% or throw food out before harmful bacteria grows on them.

Food borne illnesses are minor and temporary. Many do not seem to know that some food borne illnesses can lead to long term health conditions like kidney failure, chronic arthritis, brain and nerve damage and death.

Washing fruits and veggies with detergents will rid them of contaminants "soaps and detergents should not be used in washing the above. Their taste lingers in food and they are not fit for consumption. Wash them with clean running water and salt.

'Raw eggs are healthy and very nutritious.' Raw egg may contain salmonella or other harmful bacteria. Always cook egg thoroughly until the yoke and white are firm, not running. Avoid food or cookies containing raw or undercooked eggs.

Some of the items they disagreed will include "washing meat, poultry and sea food will get rid of bacteria-No it does not rid them of bacteria but rather increases chances of food poisoning by splashing juices or any bacteria they might contain into sinks or counter tops or other kitchen surfaces. To rid them of bacteria, make sure you cook them to the right temperature.

Female university workers attitude/perception on food safety as well as food purchasing practices are summarily positive. They realize that forgetting about or ignoring food safety measure is a recipe for disaster and act accordingly.

From their ratings on food handling and preparation practices, it is obvious that food safety standards are often compromised on long hours between preparation and eating; preserving food with chemicals, irregular check of refrigerator temperature and defrosting food on kitchen counter.

Food safety standards are compromised occasionally on hygiene, cooking or cooking food inadequately and not separating environment for cooked and uncooked food. On ways of improving household food safety practices, the workers opted for Always in all cases of hygiene, paying attention to expiration dates, eating food immediately after preparation, buying food based on quality and getting correct information with respect to food safety from health professional, magazines and newspapers. They choose often for item where they should insist on always like in separating working surfaces for cooked food and raw food; ensuring regular check up for refrigerator temperature, discouraging food preparation by sick persons, and tasting food to see if it is still good.

5. Conclusion

The outbreaks of food borne illnesses are primarily the result of ignorance manifesting in unsafe food handling practices. Female university workers should be made to view wrong practices as direct threat to health and helped to safeguard lives via sensitization/enlightenment programmes, workshops, seminars and conferences on food safety practices.

5.1 Recommendations

Female university workers are enjoined to:

- Maintain hygienic environment or asepsis to reduce food contamination risks.
- Maintain right temperature for freezing always keep fridge below 5^0c. return salads and all food promptly to the fridge to keep them safe, fresh and tasty
- Use separate plates and surfaces for raw and cooked meat, poultry, sea food and all food.
- Always cook egg thoroughly i.e. until the yoke and white are firm not running.
- Throw leftover food out before harmful bacteria grows or reheat thoroughly.
- Defrost or marinate food safely inside refrigerator, inside cold water in the microwave.
- Keep raw meat, poultry etc in sealed containers so they do not touch or contaminate others.
- Take special care of food safety for infants and young children who are particularly vulnerable to food safety threat.
- Cook all food to appropriate temperature in order to kill microorganisms.

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