ATTITUDES AND TRAINING AS DETERMINANTS OF FOOD SAFETY PRACTICES AMONG FOOD HANDLERS IN TERTIARY INSTITUTIONS IN SOUTHWEST NIGERIA

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Abstract
Food safety practices are associated with several factors such as attitude, training and knowledge among food handlers. The study was therefore conducted to investigate attitudes and training as determinants of food safety practices among food handlers in tertiary institutions in Southwest Nigeria. The study employed descriptive survey research design. The respondents for the study comprised 480 samples selected through a multi-stage sampling procedure. Data for the study were collected with the aid of self-designed structured and validated questionnaire. The questionnaire was subjected to test re-test reliability procedures and a correlation coefficient of 0.79 was obtained which was deemed high. Data for the study were analysed with the aid of frequency count, simple percentage and regression model. Findings showed that food handlers in the study area had positive attitudes towards safe food handling with mean score 3.75±1.01 and majority (55.1%) of the food handlers had received trainings in major food safe food handling practices. Findings also revealed that attitudes ($p<0.05$) and training ($p<0.05$) were significant determinants of food safety practices in the study area. The study concludes that food handlers' attitude and trainings had positive and significant effect on food safety practices in the study area. The study recommends that tertiary institutions should continue to encourage food handlers towards developing positive attitude towards food safety as well as put training programs in place for them.
Keywords: *Attitudes, training, determinants, food safety, food handlers*

Introduction

Foodborne diseases are important threats to public health which constitutes both health and economic burden to individuals and organisations, where tertiary institutions are not left out. These diseases are caused by contaminated food, which are also caused by improper food handling. World Health Organization (WHO) fact

sheets (2015) reported that food borne illnesses are usually toxic or infectious in nature and caused by viruses, bacteria, and parasites through an intake of contaminated or unsafe food substance. Udo *et al* (2019) and Ezerigwe (2018) reported that food is said to be unsafe if it is contaminated or contains harmful microbes such as bacteria, viruses, parasites or chemical substances capable of causing diseases. Food-borne diseases constitute a global threat to health and well-being of the people. WHO (2022), reported that about 600 million, representing approximated 1 in 10 people, globally, fall ill after eating contaminated food. In Africa, WHO (2023), reported that Diarrheal disease accounted for 70% of foodborne diseases in the region, making it the leading food-borne disease in the region. WHO (2023), reported that there are two million reported cases of food poisoning in Nigeria, where about 200,000 deaths were recorded. National Food and Drug Administration and Control (NAFDAC) (2023) supported WHO (2023) that over 200,000 Nigerians die of food poisoning annually. These figures showed that globally, regionally and nationally, foodborne diseases are threats to the public health. The high rate of food poisoning is caused by several factors, which vary between environment and food handlers' characteristics. Azanaw *et al*. (2019) and Teferi *et al*. (2021) reported that pathogen outbreaks are potential contributions to unsafe food substance while Kibret and Abera (2012) reported that insanitary conditions of food establishments contribute greatly to food contamination. Udo *et al* (2019) reported that knowledge of food handlers contributes to food contamination while Hamed and Mohammed (2020) reported that food safety knowledge and attitude are determinants of food safety practices. Kumie and Zeru (2007) in their study reported that good personal hygiene and food handling practices are the bases for preventing the transmission of pathogens from food handlers to consumers.

These factors are also responsible for food contamination in tertiary institutions in Nigeria, including those in Southwest, Nigeria. In addressing the challenges of food poisoning in tertiary institutions, environmental health units of tertiary institutions carryout inspection visits to food handling outlets in campuses as well as organize training for food handlers. Previous studies (Udo *et al*., 2019; Hamed and Mohammed, 2020) have investigated knowledge of food safety and attitude of food handlers towards food safety but studies on either effect of training or joint effects of attitude and training is scarce, hence, the study.

Statement of Problem

Unsafe or contaminated food constitutes global public health challenge. Food contamination is caused by microbes or diseases causing organisms that penetrated it through improper handling of food substance. Food contamination is mostly caused by food handlers' attitudes towards food handling or lack of access to adequate training. The threats caused by unsafe food consumption is so challenging that it requires urgent attention. Studies on the joint effects of attitude and training is scarce in literature, hence, the study.

Purpose of the Study

The purpose of the study is to investigate attitude and training as determinants of food safety practices in Tertiary Institutions in Southwest Nigeria.

Research Objectives

i. examine the attitude of food handlers towards food safety in the tertiary institutions in Southwest Nigeria.
ii. investigate food safety training among food handlers in the tertiary institutions in Southwest Nigeria.

Hypotheses of the study

H01: Attitude of food handlers and training received have no significant influence on food safety practices in tertiary institutions in Southwest Nigeria.

Research Methodology

The study employed a descriptive survey research design. The population for this study comprised all food handlers in tertiary institutions in southwest, Nigeria. The tertiary institutions included degree and non-degree awarding institutions. A multi-stage sampling procedure was employed to select respondents for the study. In the first stage, three (3) out of six (6) states in Southwestern Nigeria were selected for the study using simple random technique. In the second stage, two (2) degree and two (2) non- degree awarding institutions were selected from each state making a total of twelve (12) tertiary institutions using stratified sampling technique. In the third stage, 40 food handlers were selected from each institution using convenience sampling technique. A total of four hundred and eighty (480) food handlers were selected for the study.

Data were collected with the aid of self-designed structured questionnaire. The questionnaire was validated by the researchers and expert in the field of Health Education. The reliability of the instrument was carried out using test-retest approach with a correlation coefficient of 0.79, which was deemed high, reliable and significant at 0.05 alpha level. Data were collected by the researcher with the 4 trained research assistants. All copies of the questionnaires administered were successfully retrieved. Data were analysed using descriptive statistics (frequency count and simple percentage) and multiple linear regression analysis.

Ethical Considerations

The study was approved by the Health Research Ethical Committee, Institute of Public Health, Obafemi Awolowo University, Ile-Ife, Nigeria. Confidentiality of information was also ensured during statistical examination and discussion of outcomes as contained in the consent form, provided the ethical clearance for the study.

Results

Demographic characteristics of respondents

Table 1 showed the demographic characteristics of the respondents in tertiary institutions in Southwest Nigeria. The results in the table showed that 42(8.8%) and 438 (91.2%) of the respondents were male and female, respectively. This implied that food handling activities in the area were mainly undertaken by female. The results in the table also showed that 159(33.3%) of the respondents were below or equal 30 years of age, while 163(34.0%) and 77(16.0%) of the respondents were between 31-40 years and 31-40years, respectively. The results on age also showed that just 67(14.0%) of the respondents were between 51-60 years and just 14(2.9%) of the respondents were above 61 years. This implied that food handling activities in the

area were undertaken by young and active individuals. The results in the table also showed that 53(11.0%) of the respondents were sampled from Cafeteria, 259(54.0%) and 29(6.0%) respondents were sampled from Bukateria and Restaurant, respectively, while 139(29.0%) respondents were sampled from others. The others were fast food, corn or yam roasting and other kiosk food handling outlets in the sampled institutions. The results in the table also showed that 14(2.9%) and 67(14.0%) of the respondents had no formal education and Primary education, respectively,

Table 1: Demographic characteristics of respondents

Variables	Frequency	Percentage
Gender		
Male	42	8.8
Female	438	91.2
Total	**480**	**100**
Age (year)		
≤30	159	33.3
31-40	163	34.0
41-50	77	16.0
51-60	67	14.0
≥61	14	2.9
Total	**480**	**100**
Food enterprise type		
Cafeteria	53	11.0
Bukateria	259	54.0
Restaurant	29	6.0
Others	139	29.0
Total	**480**	**100**

Source: Field survey, 2025

Research objective 1: Examine the attitude of food handlers towards food safety in the study area

Table 2: Attitude of food handlers towards food safety in the study area

Items	Attitudinal measurements				
	Always	**Sometimes**	**Rarely**	**Never**	**Mean Score**
If I am provided with safe food handling practices guideline, I will surely follow all of it even without supervision of my employer.	391(81.5%)	89(18.5%)	-	-	3.76±1.02
If food training is given, I would practice a better food handling.	337(70.2%)	143(29.8%)	-	-	3.70±0.97
I do not touch cooked foods with bear hands.	337(70.2%)	143(29.8%)	-	-	3.70±0.97
I always make sure raw foods are in good condition before	389(81%)	89(18.5%)	2(0.4%)	-	3.80±1.02

cooking.					
I believe good personal hygiene can prevent foodborne illnesses.	478(99.6%)	2(0.4%)	-	-	3.99±1.08
It is my responsibility to practice safe handling.	340(70.8%)	139(29%)	1(0.2%)	-	3.71±0.98
I am willing to attend training regarding food hygiene.	310(64.6%)	170(35.4%)	-	-	3.64±0.88
I will handle food differently if I know my handling practice is not right.	364(75.8%)	80(16.7%)	36(7.5%)	-	3.66±0.93
Pooled mean of attitudes					3.75±1.01

Source: Field survey, 2025

Table 2 showed the results of attitude of food handlers towards food safety in the study area. According to results in the table, majority, 391(81.5%) indicated that they will surely always follow safe food handling without supervision by their employer if safe food handling guidelines are provided while 89(18.5%) indicated that they will surely sometimes follow safe food handling without supervision by their employer if safe food handling guidelines are provided. The mean attitude score was 3.76±1.02. The results in the table also showed that 337(70.2%) indicated always that if food training is given, they would practice a better food handling while 143(29.8%) indicated sometimes that if food training is given, they would practice a better food handling. The mean attitude score was 3.70±0.97. Results in the table also showed that 337(70.2%) indicated that they do not always touch cooked foods with bear hands while 143(29.8%) indicated that they did not sometimes touch cooked foods with bear hands. The mean attitude score was 3.70±0.97. Results in the table also showed that 398(81%) of the respondents indicated that they always make sure raw foods are in good condition before cooking while 89(18.5%) indicated that they sometimes make sure raw foods are in good condition before cooking. The mean attitude score was 3.80±1.02. The result in the table further showed that majority, 478(99.6%) indicated that they always believe that good personal hygiene can prevent foodborne illnesses while just 2(0.4%) indicated that they sometimes believe that good personal hygiene can prevent foodborne illnesses. The mean attitude score was 3.99±1.08. Result also showed that 340(70.8%) indicated that it is their responsibility always to practice safe handling while 139(29%) and 1(0.2%) indicated that it is their responsibilities sometimes and rarely to practice safe food handling. The mean attitude score was 3.71±0.98. Results further showed that majority, 310(64.6%) indicated that they were always willing to attend training regarding food hygiene while 170(33.4%) indicated that they were sometimes willing to attend training regarding food hygiene. The mean attitude score was 3.64±0.88. The results in the table also showed that majority, 364(75.8%) indicated always that they will handle food differently if they know their food handling practice is not right while 80(16.7%) and 36(7.5%) indicated sometimes and rarely that they will handle food differently if they know their food handling practice is not right. The mean attitude score was 3.68±0.93. The mean

pooled (overall) attitudinal score was 3.75±1.01, which implied that food handlers in the area always had positive attitudes towards food safety practices.

Research objective 2: Investigate food safety training among food handlers in the study area.

Table 3: Food safety trainings among food handlers in the study area

Trainings	Yes	No	Undecided
Food hygiene	445(92.7%)	7(1.5%)	28(5.8%)
Food safety	443(92.3%)	9(1.9%)	28(5.8%)
Diseases prevention	186(38.8%)	96(20%)	198(41.2%)
Best food handling practices.	222(46.2%)	90(18.8%)	168(35%)
Wastes disposed far away from cooking spot.	335(69.8%)	68(14.2%)	77(16%)
Procedure for reporting illnesses or injuries to my employer.	102(21.2%)	261(54.4%)	117(24.4%)
Correct temperature range for storing hot foods.	74(15.4%)	340(70.8%)	66(13.8%)
Correct procedure for disposing of expired or spoilt food.	37(7.7%)	345(71.9%)	98(20.4%)
Food safety certification.	278(57.9%)	98(20.4%)	104(21.7%)
Food safety regulations or guidelines.	393(81.9%)	24(5%)	63(13.1%)
Pooled percentage	2643(55.1%)	1216(25.3%)	947(19.7%)

Source: Field survey, 2025

Table 3 showed the food safety trainings undertaken by food handlers in the study area. According to the results in the table, Majority, 445(92.7%) of the respondents indicated that they had attended training on food hygiene while 28(5.8%) and 7(1.5%) were undecided and had not attended food hygiene training, respectively. Majority, 443(92.3%) of the respondents indicated that they had attended training on food safety while 28(5.8%) and 9(1.9%) were undecided and had not received training on food safety, respectively. Also, 198(41.2%) were undecided about training on diseases prevention while 186(38.8%) indicated that they had received training on diseases prevention. However, just 96(20%) had not received training on diseases prevention. Results also showed that 222(46.2%) of the respondents indicated that they had attended training on best food handling practices while 168(35%) were undecided about the training. However, 90(18.8%) of them had not received training on best food handling practices. Majority, 335(69.8%) of the respondents indicated that they had received training on disposing wastes far away from cooking spot while 77(16%) were undecided and 68(14.2%) had not received training on disposing wastes far away from cooking spot. Majority, 261(54.4%) of the respondents indicated that they had not received training on procedure for reporting illnesses or injuries to their employers while 117(24.4%) were undecided and just 102(21.2%) indicated that they had received training on procedure for reporting illnesses or injuries to their employers. Result further showed that majority, 340(70.8%) of the respondents indicated that they had not received training on correct temperature range for storing hot foods while 74(15.4%)) indicated that received such training and 66(13.8%) were undecided. Majority, 345(71.9%) of the respondents indicated that they had not received training on correct procedure for disposing of expired or spoilt food while 98(20.4%) were undecided and just 37(7.7%) of the respondents indicated that they had received training on correct procedure for disposing of expired or spoiled food. Majority, 278(57.9%) of the respondents indicated that they had food safety certification while 104(21.7%) were undecided and just 98(20.4%) had no food safety certification. Majority, 393(81.9%) of the respondents had received training on food safety regulations or guidelines while 63(13.1%) were undecided and just 24(5%) had not received training on food safety regulations or guidelines.

Hypothesis 1: Attitude of food handlers and training received have no significant influence on food safety practices in tertiary institutions in Southwest, Nigeria.

Table 4: Effects of attitude and training on food safety practices in tertiary institutions in Southwest, Nigeria.

Variables	Coefficient	Standard error	t-value	Sig.
Constant	14.764**	1.532	9.635	0.000
Specified Determinants variables				
Attitude of food handlers score	0.053**	0.014	3.786	0.002
Training score	0.111**	0.070	1.574	0.007
R^2	0.89			
F-value	6.476**			

Source: Field survey, 2025

Table 4 showed the regression results of the effects of attitudes and training on food safety practices of food handlers in tertiary institutions in Southwest, Nigeria. The results revealed an R^2 value of 0.89, which showed that 89% variation in the dependent variable is explained by the independent variables. The F-value of the model was 6.476 and was significant at 5% alpha level. This showed that the entire model was fit to explain the effects of attitudes and training on food safety practices in tertiary institutions in Southwest, Nigeria. The results showed that attitudes of food handlers towards food handling ($p<0.05$) is a significant determinant of food safety practices. The results further showed that training ($p<0.05$) is a significant determinants of food safety practices in the study area.

Discussion

A major finding of the study revealed that food handlers in tertiary institutions in Southwest Nigeria had positive attitudes towards better safe food handling and good personal hygiene practices. This is in agreement with Udo *et al* (2019) and Garba and Mustapha (2025) that food handlers in Universities practice safe food handling and hygiene practices. Also, findings of the study revealed that food handlers in the study area were willing to attend training in better safe food handling and hygiene practices. Another major finding of the study revealed that attitudes of food handlers and trainings received were significant determinants of food safety practices in the study area. This is in agreement with Udo *et al* (2019), Hamed and Mohammed (2020) and Teferi *et al* (2021) that food handlers' attitudes and food safety practices are directly related.

Conclusion

Based on the findings from the study, it was concluded that food handlers in tertiary institution in the study area had positive attitudes towards safe food handling and they had received training in major food hygiene practices. The study also concluded that food handlers' attitude and trainings are significant determinants of food safety practices in the study area.

Recommendation

The study recommends that tertiary institution managements should put necessary measures that would encourage positive attitudes towards safe food handling practices and periodic training of food handlers in place.

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