

# LINKAGE BETWEEN FOOD HYGIENE KNOWLEDGE AND PRACTICES AMONG FOOD HANDLERS IN RESTAURANTS AND HOTELS IN THIKA, KENYA

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**Abstract:** The purpose of this research was to establish the linkage between food hygiene knowledge and practice among food handlers' in restaurants and hotels in Thika, Kenya. A cross sectional survey design was adopted for the study. A sample size of 216 food handlers were randomly sampled from a target population of 470 food handlers. The researcher administered questionnaires to the sampled population. The questionnaires for collecting data were validated through a pretest study while Cronbach's Alpha test was done to test reliability of the questionnaire. A total of 184 questionnaires were found fit and complete for data analysis. Coded responses were analyzed quantitatively using means, percentages, frequency distributions and standard deviations. Further test of correlation was done to test the linkage between the variables. Generally, the food handler's knowledge was high with a mean percentage score of positive answers of (81.1%±7.3%). With regards to attitudes the food handlers exhibited positive attitude towards food hygiene with an overall mean of 3.6±0.5 out total 5. Overall, the food handlers had good practices in food hygiene with a mean percentage score of 86.3%±8.3%. However, a considerable number of food handlers (27.5%) exhibited unhygienic food practices. The Pearson correlation was performed to find the linkage between food hygiene knowledge and food hygiene practices. The results revealed a positive relationship was established between food hygiene knowledge ( $r = 0.534$ ) and food hygiene practices  $p < 0.05$ . The public health authorities should do thorough checks to ensure that all food handlers hold valid medical certificates and clearances. The managers in the restaurants and hotel should ensure that all food handlers are free from illness and those ill should not be allowed to handle food. They should introduce continuous awareness on food hygiene knowledge and encourage proper food hygiene practices. Similar studies need to be carried out among food handlers operating in the many fast food restaurants and food kiosks around the country.

**Index terms:** Food hygiene, Food borne illnesses, Food Handlers, Knowledge, Practices.

## 1.0. INTRODUCTION

The main contributing features that lead to cause and wide spread of foodborne illnesses are adequate knowledge and inappropriate practices by the so called food handlers. Foodborne diseases are more prevalent complications today's century (Wheelock, 2006). Foodborne illnesses have become a health concern in developed and developing countries. Developing nations like Kenya, are suffering prevailing deplorable practices in food hygiene and sanitation, fragile regulatory systems, poorly implemented food safety regulations, insufficient monetary resources for food safety equipment, inadequate education, skills and awareness amongst food handlers (Githiri, Okemo, & Kimiywe, 2013).

World Health Organization (WHO) statistics revealed that developed nation's record almost up to 30% of food microbial illnesses while such cases are higher in developing nations (WHO, 2005). Food borne infections occur daily in developing nations and they are associated with consumption of food mostly contaminated with bacteria, parasites and viruses (WHO, 2008). According to (WHO, 2008) cases of food borne diseases occur daily throughout the world, from the most to the least developed countries and they are attributed to consumption of contaminated food with a wide variety of bacteria, parasites and viruses. Researches on foodborne illnesses have revealed that approximately all such cases are linked to failure to sternly observe food preparation, cooking and food processing standards and retailing and storage processes (Tomohide, 2010). A confirmation that foodborne illnesses are as results of malpractices in processes of preparation in hotels, restaurants, homes and places where it is sold for human consumption (Motarjemi & Mortimore, 2005). Hence, inadequate awareness among food handlers in those premises poses substantial health risks to the public.

Previously there has been worrying cases resulting from food contamination in hotels that have led to patients getting admitted to hospitals and even at times leading to deaths of such patients in Kenya, (Wanzala, 2019). For instance, the year 2017, two hotels in Nairobi regions were closed indefinitely as a result of an outbreak of cholera (Wanzala, 2019). A research by Kenya Medical Research Institute (KEMRI) revealed that, a third of food handlers working in food related industries who sought medical certificates and clearances carried exceedingly drug-resistant microbes. Besides, they had gone ahead to secure jobs in restaurants, road side cafeterias and high end city hotels (Gathura, 2017). This brings out a big question on the safety of the food preparations, food handling and food processing in food units around the country. A study in Kenya evaluated knowledge of food handlers' on Food Safety Management (Cheloti-Mapelu & Onyango, 2019). Their results showed that food handlers had adequate knowledge on several aspects of food safety management. Nevertheless, there were gaps on knowledge especially on areas like food temperature controls, contamination causes. The study suggested an in-depth FSM orientation plan and training for each food handler in their job levels. Inadequate knowledge and deplorable food hygiene practices in relation to foods are some of the factors contributing to foodborne illnesses (Antonio, Elena, Guiomar, Magdevis-Yanet, Fernando, & Rosa, 2016). The current study aimed at investigating the linkage between food hygiene knowledge and practices amongst food handlers in restaurants and hotels and in Thika, Kenya. The following were the research questions;

- i. What is the extent of food hygiene knowledge among food handlers in restaurants and hotels?
- ii. What are the food hygiene practices among food handlers in restaurants and hotels?
- iii. Is there a linkage between food hygiene knowledge and practices in restaurants and hotels?

### The hypothesis tested:

**Ho:** there is no statistically significant linkage between food hygiene knowledge and food hygiene practices in restaurants and hotels.

## 2.0. MATERIALS AND METHODS

The study was conducted in selected twenty best restaurants and hotels in Thika town, Kenya. A cross-sectional survey design was adopted for the study. A sample of two hundred and sixteen respondents determined using Yamane's formula was randomly selected for the study from a target of four hundred and seventy food handlers. Among food handlers who participated in the study include; stores and procurement clerks, cooks, waiters, assistant cooks, and heads of food sections, bartenders, and supervisors of beverage sections. Structured questionnaires and observation list were used to collect data. Data collection tools were researcher administered. The total administered questionnaires were two hundred and sixteen. Only one hundred and eighty four were found complete and fit for data analysis. The questionnaire for collecting data were adopted and adjusted from, (Sharif, Al-Dalalah, & Obaidat, 2013). Cronbach's alpha test was used to test reliability that achieved a coefficient of 0.74. Food hygiene knowledge and practices used a two point scale (correct response=1 and incorrect=0) then the total responses were converted to percentage score to shorten the presentation and interpretation of the results. Data was analyzed with the help of statistical package for

social sciences (IBM SPSS) version 22 and then presented in descriptive statistics in terms of percentages, tables and figures.

### 3.0. FINDINGS AND DISCUSSION

#### 3.1. Food Hygiene Knowledge amongst Food Handlers

Table 1: Food handler's response to knowledge questions on food hygiene

Question	Positive answer (%)	Negative answer (%)
1. Hand washing is important to protect others from disease causing organisms	91.3	8.7
2. Insects such as rats and cockroaches can cause food contamination after cooking	82.6	17.4
3. Drinking water can be contaminated when the water gets into contact with sewer water	80	20
4. Cholera can be caused by drinking contaminated water and food	93.6	6.4
5. Left- over food have to be adequately reheated to prevent food poisoning	76.1	23.9
6. Food handlers should undergo training on food hygiene and safety to prevent disease outbreak in food establishments	57	43
7. All pathogens likely to cause food borne illness can be seen by the eye	84	16
8. Food poisoning is a serious disease that can result to hospitalization and even death	74.9	25.1
9. Eating unwashed fruits can increase the risk of food poisoning	78.5	21.5
10. Keeping food at refrigerator temperature decreases multiplication of harmful bacteria	90	10
11. A healthy looking food handler is not likely to transmit foodborne illness	76.8	23.2
12. A food handler should wash their hands after handling money	88	12

Table 1 shows response of food handlers to knowledge questions on food hygiene. Generally, the food handler's knowledge was high with a mean percentage score of positive answers of (81.1%±7.3%). They demonstrated that employees have high food hygiene knowledge especially on areas like; food borne diseases, hand washing, sources of food contamination and food storage temperatures. The study reaffirms similar findings by (Tessema, Gelaye, & Chercos, 2014); who carried out a study in Ethiopia on the factors influencing food handling Practices for food handlers in food and drink establishments. The findings of their study revealed that 52.5% had good better food hygiene knowledge and handling practices. Further reaffirms findings by (Sani, & Siow, 2014) study in Malaysia revealed that respondents possessed knowledge about foodborne diseases, personal hygiene and temperature regulations for food. Also, a study by (Sharif, Al-Dalalaha & Obaidat, (2013) in Jordan revealed high percentage scores on knowledge amongst food handlers.

However, this study finding contradicts the findings of a study carried out in Brazil that sought to assess the level of attitudes, knowledge, and practices amongst food handlers. The results revealed that 92.2% of the food handlers had inadequate knowledge (Soares, Cerqueira, Carvalho, Almeida & Nunes, 2012). Also, the findings contradicts the results that revealed that employees lack basic knowledge on food hygiene and causes of food borne illnesses among others (Baş, Ersun, & Kıvanç, 2006); (Onyango, & Cheloti-Mapelu, 2019); (Pichler, Ziegler, Aldrian, & Allerberger, (2014).

### 3.2. Food Hygiene Practices amongst Food Handlers

Table 2: Food handler's response to food hygiene practices questions

Question	Hygienic practice	Unhygienic practice
	%	%
1. Do you have a valid medical exam certificate?	82	18
2. Do you wash your hands with soap and water before handling food?	93.6	6.4
3.		
4. Do you wash your hands with soap and water after visiting the toilet?	88.2	11.8
5. Do you work when you have a cold?	72.5	27.5
6. Do you handle food when sick with diarrhea?	73.1	26.9
7. Do you boil or treat water before serving the customers?	87	13
8. Do you wash cutting boards after using between food items	94	6
9. Do you separate raw food from cooked food?	89.3	10.7
10. Do you store left over food in the refrigerator?	97	3
11. Do you cover your head when handling food?	67.7	32.3
12. Do you check if meat is fully cooked?	94.9	5.1
13. Do you wash fruits and vegetables with tap water?	96.4	3.6

Table 2 above demonstrates the food hygiene practices of food handlers in hotels and restaurants in Thika town. Overall, the food handlers had good practices in food hygiene with a mean percentage score of  $86.3\% \pm 8.3\%$ . This supports findings of (Rebouças, Martins, Menezes, Santiago, Araújo & De-Castro, 2017), in Brazil in a study that sought to establish the level of knowledge, attitudes and the extent of practices among food handlers; knowledge and extent of practices among head chefs together with managers in hotels' and restaurants. The results revealed that food handlers had appropriate practices on personal hygiene. Aslo, (Shuvo, 2018) who carried out a cross-sectional study to evaluate the extent of practices among food handlers on hygiene and sanitation, revealed noble practices on food hygiene.

However, in this current study, a number of food handlers exhibited unhygienic food practices in various aspects for instance, 27.5% went to work when sick with a cold while 32.3% did not cover their head when handling food. This finding conforms to a study carried out in Ghana that sought to assess practices of organisational food handlers in respect to hygienic practices recommended for food and general safety. The results revealed that institutional food-handlers have reasonable food safety knowledge but that is not reflected in strict hygienic practices when processing and managing food products (Akabanda, Owusu-Kwarteng & Hlortsi, 2017). Further, the findings conform to those of (Soares, Carvalho, Cerqueira, Almeida & Nunes, 2012) who revealed lack of enough hygienic practices amongst food handlers, stressing on importance of reviewing the existing model used to train food handlers.

### 3.0. Linkage between Food Hygiene Knowledge and Practices

Table 3. Pearson Correlation Coefficient on job satisfaction

		FOOD HYGIENE PRACTICES	FOOD HYGIENE KNOWLEDGE
Pearson Correlation	Food hygiene practices	1.000	.534
	Food hygiene knowledge	.534	1.000
Sig. (1-tailed)	Food hygiene practices	.	.000
	Food hygiene knowledge	.000	.
N	Food hygiene practices	184	184
	Food hygiene knowledge	184	184

\*\* . Correlation is significant at the 0.05 level (2-tailed).

N=184

Table 4 above shows the correlation between food hygiene and practices among food handlers in restaurants and hotels in Thika, Kenya. The Pearson correlation was performed to find out the correlation between food hygiene knowledge and food hygiene practices. The results are reflected in the above table 3.0. A positive relationship was established between food hygiene knowledge ( $r = 0.534$ ) and food hygiene practices  $p < 0.05$ . Therefore, the null hypothesis was rejected and the alternative hypothesis accepted that stated; there is statistically significant relationship between food hygiene knowledge and food hygiene practices. The results revealed that high food hygiene knowledge lead to better food hygiene practices. The results point out that food hygiene knowledge significantly affects food hygiene practices in restaurants and hotels. Positive correlations between food hygiene knowledge and food hygiene practices empirically support the argument of (Al-Shabib, Husain & Mosilhey, 2016); (Sani & Siow, 2014). De-Souza, Seabra & De-Azevedo, (2018) also reported a positive linkage between knowledge on food safety and practices related to food handling practices in Brazil. Tessema, Gelaye, & Chercos, (2014) revealed that knowledge about food handling, shower facilities, separate rooms for dressing were significantly connected with better practices for food handling.

#### 4.0. CONCLUSION AND RECOMMENDATIONS

The findings of this study demonstrated that the food handler's knowledge on food hygiene was adequate. The results illustrated that most of the food handlers had good food hygiene knowledge and practiced food hygiene. However, a significant number of food handlers' unhygienic food hygiene practices in certain aspects where 27.5 % and 26.9 % of them reported to handle food when they have a cold and sick with diarrhea respectively. These practices increase the risk of transmitting foodborne pathogens, such as *E. coli* and non-typhoidal *Salmonella*. The study revealed that food hygiene knowledge is significantly linked to food hygiene practices. Hence, high levels of food hygiene knowledge are an indication of better food hygiene practices. As a result there is need for harmonized actions on food safety sealing of knowledge gaps concerning appropriate cooking temperature, food holding and storage.

The study proposes that continuous awareness should be ensured to strengthen food handlers' levels of knowledge and food related adopted legislations and aspects that are lacking. Further, public health authorities both at national and county levels ought to ensure that food handlers in food establishments follow the recommended food hygiene guidelines. In addition, the authorities should also do thorough checks to ensure that all food handlers hold valid medical certificates and clearances for safe handling of food and health of public. Restaurant and hotel managers should ensure that all food handlers are free from illness and those ill should not be allowed to handle food. Similar studies need to be carried out among food handlers operating in the many fast food restaurants and food kiosks around the country.

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