

# Factors affecting Food handling among Food handlers in Lira city west division in Lira city

ICEL Solomon<sup>1,\*</sup>

<sup>1</sup> Alliance for Public Health advocate-ALPHA Lira (U), Uganda

---

Received: 26.04.2022

• Accepted: 30.05.2022

---

**Abstract:** Food born illness has been associated with poor practices of food handling among food handlers who provides food to public as raw or cooked food. Nevertheless, it is considered important for food handlers to observe strict hygienic practices during the process of cleaning, cooking, packaging and storing food for human consumption. It has been noted that services providers in food markets always fail to abide by the protocols in handling food for human consumption. The study determined factors affecting food handling among food handlers in Lira city west division, Lira city. The study employed descriptive cross-sectional survey design with quantitative data collection method among 145 food handlers who constituted the study participants. Data was collected with used of closed-ended questionnaires and then afterwards analyzed through used of spss version 20. The study found out that 88.3% of the respondents were knowledgeable about safe food handling based on the evidenced that the majority had secondary level of education. Additionally, knowledge was not found to factors affecting food handling among food handler. in support to that, the environmental factors such as cleaning of utensils with towel and poor waste disposal practices in water channels and open spaced were noted to have negative effects on food handling. Furthermore, the socio-cultural factors such as bad practice of eating while serving customers, practice of not wear apron and covering of head (Hair) were found to be associated with food contamination among food handlers.

**Keywords:** Food born infections, Food handlers, Food safety and Hygienic food practices

## 1. Introduction

Approximately 600 million cases of food borne diseases and 420,000 deaths occurs yearly across the globe. To worsen the situation, 30% of all deaths associated with food borne diseases occurs among Children of under 5 years of age WHO estimated that 33 million years of healthy lives are lost due to eating unsafe food globally each year, and this number is likely underestimation (WHO, 2015), (Bimbraw, 2021). Foodborne illnesses are a burden globally to public health and to a nation's economy (Copenhagen, 2015; Young &Waddell, 2016). According to CDC update 2017, each year about 50 million people succumb to food -based ailments leading to death of an estimated 3000 people across the world. More than 200 known diseases have been transmitted through unsafe food. As a result, around 2.0 billion illnesses are associated with food borne diseases. Concerning low-income countries, food born disease causes 2 million deaths. Also, it is related to high rate of hospitalizations and treatment cost.

---

\* Corresponding Author: allianceforpublichealthadvocat@gmail.com and Mobile: +256781184589

The non-financial component of the COI model accounts for the intangible valuation of the ‘pain, grief & suffering’ - the human cost of food borne-related illness, chronic disability and fatalities. These are concepts which are difficult to measure on a simple monetary basis, as they represent a ‘non-market cost’ and thus need to be valued by other means (Daniel, N, et al., 2020).

In March 2019, 278 food related illnesses were reported in amidst and Napak districts of Karamoja region of Uganda and 5 people died (food safety news by Joe Whitworth on October 13, 2020).

Clearly, food handlers play a critical role in ensuring food hygiene in the food establishments. Yet, 10–20% of food-borne diseases are due to contamination of food-by-food handlers. This is mainly due to poor hygienic status of food handlers, improper cooking procedures and unsafe storage and handling of food and equipment, which paves the way for pathogens to come into contact with food and cause illness in consumers.

Over the years, safety and quality of food produced for human consumption in developing countries continue to increase because of food borne disease outbreaks attributed to unsafe raw food, abused temperature, poor storage infrastructures, inadequate cooking, poor personal hygiene, improper handling methods, and cross- contamination of cooked food with uncooked raw food (Odeyemi, O. A. (2016).

Many restaurants have been opened in trading center commonly known as “Rainbow” to help provide food to the members of the community who operate different businesses around the place where temporary shelters are erected on both sides of the road where food is provided. These restaurants are of poor structures and situated alongside a very dusty marram road known as Aduku road which is so uncondusive in the dry seasons. This is a reflection of a study which was done in Nigeria and Kenya in 2009 that showed that type of premise, unclean equipment and work responsibility were factors affecting food handling practices (Harelaaretal).

It is important that the people handling food observe certain strict hygiene measures during cleaning, preserving, cooking or storing food for human consumption. However, there are indications that the service providers do not follow the recommended procedures in handling food for public consumption. They do not cover their heads, wear clean clothes, wipe tables and serving surfaces with enough clean water and detergent and all these including other associated factors can lead to food contamination and the expected rise in foodborne illnesses.

## **2. Methodology**

### **2.1. Study design**

Descriptive cross-sectional study design using quantitative data collection methods

### **2.2. Study area**

The study was conducted in Lira city west division, Lira city.

### **2.3. Study population**

The population comprised of all food handlers in restaurants operating in Lira city west division

#### **2.4. Sampling procedure**

The required sample size was taken from randomly selected public food restaurants in Obutowelo village, Lira district.

#### **2.5. Inclusion:**

For an individual to qualify to participate in the study, he or she must be working in the selected restaurants in the study area.

#### **2.6. Exclusion:**

All the food handlers working in restaurant were selected to participate in the study

#### **2.7. Study procedures**

Permission was granted by the district health officer

#### **2.8. Data collection methods and tools/ instruments**

Pre-tested structured questionnaire adapted from different literature were used to collect socio demographic and others variables.

Data was collected from each food handler's with used of self-administered closed-ended questionnaires.

#### **2.9. Data analysis**

Data was coded and entered in spss version 20 and analysis was done at only univariate level.

#### **2.10.Independent variable**

Factors affecting food handling practices among food handlers in restaurants in Lira city west division, Lira city;

Socio demographic variables - age, sex, income, educational status, marital status, building ownerships, Religion food handlers, Knowledge, training, sanitary inspection and medical checkup.

Environmental factors - Handwashing facility, toilet facility, solid and liquid waste disposal sanitary facilities like water supply and utensil cleanliness.

#### **2.11.Dependent variable**

Practice of food handlers classified as good food handling practice and poor handling practice based on the measurement for food handling practice.

#### **2.12.Ethical considerations**

The researcher ensured ethical consideration through ethical approval, seeking consent, confidentiality and privacy during data collection process.

### 3. Results

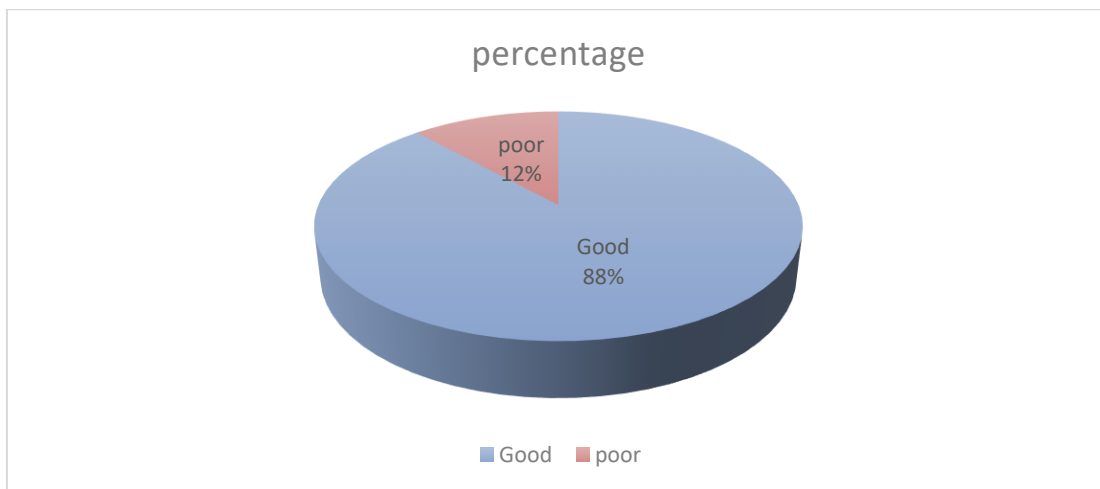
#### 3.1. Socio-demographic characteristics of the respondents

According to the results from this study, majority of the respondents 60(43.8%) were aged (18-25 years), female 116(84.7%) contributed to highest participants in the study than the male 21(15.3%). In addition to that, most of the respondents were married 64(46.7%) and divorced respondents 8(5.8%) were poorly represented in the study. The majority of the participants attained secondary level of education 42(30.7%) compared to few of them in tertiary level of education 18(13.1%).

**Table 1.** below shows the socio-demographic characteristics of the respondents

<b>Variable</b>	<b>Frequency (N=137)</b>	<b>Percentage (100%)</b>
<b>Age</b>		
18-25 years	60	43.8
25-35 years	49	35.8
Above 35 years	28	20.4
<b>Sex</b>		
Male	21	15.3
Female	116	84.7
<b>Marital status</b>		
Single	54	39.4
Married	64	46.7
Divorced	8	5.8
Widowed	11	8.0
<b>Educational level</b>		
No education	41	29.9
Primary	36	26.3
Secondary	42	30.7
Tertiary	18	13.1

**Figure 1.** Level of food handling among Food handlers in Lira city west division, Lira city



In the figure above, the highest percentages of the study participants had good knowledge and practices about food handling.

**Knowledge factors affecting food handle practices**

According to this study, the majority of the respondents 121(88.3%) reported that they have heard about food borne disease, germs was reported by 124(90.5%) as the diseases causing Organism. Additionally, 85(62.0%) reported contaminated food as the ways in which food borne diseases can be transmitted, raw meat was reported by 120(88.9%) as it can also transmits germs, 110(81.5%) of the respondents reported that milk contaminated can transmit infections.

In continuation, 103(81.5%) of the respondents reported that personal hygiene can prevent the transmission of food borne diseases. On the bad notes, highest percentage of the respondents 103(70.7%) accounted for those who have never had training regarding personnel hygiene in the restaurants.

**Table 2.** Knowledge factors affecting food handling practices

Variable	Frequency (N=137)	Percentage (100%)
Have you heard about food borne diseases		
Yes	121	88.3
No	16	11.7
What is your source of information about food borne diseases		
Health centre	29	23.2
Sanitation inspector	4	3.2
Mass media, Radio, TV	34	27.2
School	33	24.4
Customers, friends and family	25	20
What is the cause of food borne diseases		
Germ	124	90.5
Chemical	13	9.5

Food borne diseases is transmitted by		
Contaminated food	85	62.0
Contaminated water	18	13.1
Vector	34	24.8
What is the reason for food contamination		
Dirty hand	27	19.7
Dirty working environment	86	62.8
Using contaminated water	8	5.8
Unclean Utensils	11	8.0
Infected food handlers	5	3.6
Does raw meat transmit infection		
Yes	120	88.9
No	15	11.1
Does raw milk transmit infection		
Yes	110	81.5
No	25	18.5
Personal hygiene can prevent food borne disease		
Yes	103	76.3
No	32	23.7
Does raw vegetable transmit infection		
Yes	112	83
No	23	17
How long have you work in the restaurant		
Less than 6 months	37	27.6
1-2 years	38	27.5
More than 2 years	60	44.4
Have you received any training		
Yes	39	29.3
No	94	70.7

### Cultural practices affecting food handling practices

In this study, highest number of respondents 103(77.4%) reported washing hands with soap after visiting latrine, 63(47.4%) reported that they eat or during while serving customers. Majority of them reported that they stored Utensils in the well-arranged manner 108(81.2%), 122(91.7%) accounted for those who reported that they kept utensils free of dusts.

Additionally, 58(43.6%) of the respondents reported that they don't wear apron while preparing food, 117(88%) reported washing hands with soap before preparing food.

**Table 3.** Socio- Cultural factors affecting food handling practices

<b>Variables</b>	<b>Frequency (137)</b>	<b>Percentages (100%)</b>
Do you wash hand with soap after visiting latrine		
Yes	103	77.4
No	30	22.6
Do you drink or eat while serving or preparing		
Yes	63	47.4
No	70	52.6
Do you keep ready to eat food in a clean container		
Yes	121	91.0
No	12	9.0
Do you store food utensil in well-arranged manner		
Yes	108	81.2
No	25	18.8
Do you keep the food utensil free of dusty parties		
Yes	122	91.7
No	11	8.3
Do you keep clean utensils from each other's		
Yes	121	91.0
No	12	9.0
Do you wash hand always before preparing food		
Yes	117	88
No	16	12
Do you wear apron and cover head		
Yes	75	56.4
No	58	43.6
Do you keep your finger nail short		
Yes	122	91.7
No	11	8.3
Do you clean and sanitize work surfaces after each other		
Yes	120	90.2
No	13	9.8

Do you wash hand with soap and after working		
Yes	123	93.2
No	9	6.8

### Environmental factors affecting food handling among food handlers

Majority of the respondents reported that always they dry Utensils through wiping with reusable towel 100(76.3%), 81(60.9%) reported waste disposal in the rubbish pits and few of them 18(13.5%) reported water drainage disposal of waste. Additionally, most of them reported the present of latrines in their working environment 125(95.4%) and 125(92.4%) of the total respondents reported that they have functional kitchen in the Hotel.

Lastly, 111(84.7%) of the respondents reported water Jerrycan as the hand washing facilities with only 9(6.9%) accounted for those who were using pipe water fountain as hand washing facilities.

**Table 4.** The table below shows the environmental factors affecting food handling.

Variable	Frequency (N=137)	Percentage (100%)
<b>How do your dry utensil</b>		
Wipe using reusable towel	100	76.3
Spread out on rack	24	17.5
Others	7	5.3
<b>How do you handle waste</b>		
Rubbish pit	81	60.9
Open space	34	25.6
Water drainage	18	13.5
<b>Is there availability of latrine</b>		
Yes	125	95.4
No	6	4.6
<b>Is there availability of kitchen</b>		
Yes	121	92.4
No	10	7.6
<b>What type of hand washing facility do you have</b>		
Pipe fountain	9	6.9
Welded metal	11	8.4
Jerrycan	111	84.7



## 4. Discussion of Results

### 4.1. Knowledge factors affecting food handling practices

From this study, the researcher founded that 121(88.3%) have knowledge about food handling practices and the majority reported mass media 34(27%) and health facilities 29(23.2%) as sources of the information's about food handling practices. According to the study conducted in Kampala (Ssebatta, 2016) on the Knowledge about food handling, the Knowledge was found to be relatively low which was not in line to the findings from this study, because the results shows that most of the food handlers in Obutowelo had knowledge about food handling practices.

This could be due to the facts that most of the food vendors attained secondary level of education 42(30.7%) and tertiary institutions 18(13.2) which shows high level of knowledge and experiences on food handling or they have undergone through several trainings on food hygiene. In addition to that, the majority were aged (15-25 years) 60(43.8%) and most both those aged group still have fresh brain and eager to learn new things hence making them to practice and promote proper food hygiene.

Furthermore, the researcher found 124(90.5%) of the respondents were well knowledge about the causation of food borne diseases in which reported that, it is cause by the germs and they continue saying that contaminated food 85(62.0%) or water transmits the food borne diseases.

The major reason for food contaminated was reported to be highly associated with the dirty working environment. This based on the fact that, in environment is uncleansed, the transmission of germs become very easy through wind, utensils or the food handlers. In this study, 86(62.8%) reported contaminated environment and dirty hands 27(19.7%) as the major reasons for food contamination.

In addition to that, most of the respondents reported that raw meats 120(85%) or milk 110(81.5%) associated with the transmission of the food borne infections. This was similar to the study conducted in Kampala among food handlers which indicated that most of the food handlers were having sufficient knowledge about food handling and its associated factors but they were not properly practicing good food handling practices (Ssebatta, 2016) . This was due to high level of education among the food handlers since most of them attended high schools and others tertiary institution and majority of them were young with fresh brain. On the other hand, the low food handling practice could be due to ignorance, tendency of acquiring high profits since some of the food handling practices require a lot of money to implement them effectively.

Lastly, the majority of the food handlers 93(70.7%) reported that they did not have any training about food handling practices with only 39(29.3%) accounted for those who were trained on the food handling practices. The above finding provides deeper explanation for the reason of low food handling practices which support the findings from the study conducted among Food handlers which revealed that, food handlers who received training would have a better understanding of safe food handling practice as they might get professional advice during training. Training could provide knowledge and enhance food handler's overall performance in safe food handling practice Chekol, F. A., (2019).

### 4.2. Environmental factors affecting food handling practices among the food handlers

According to the data collected and analyzed founded that majority of the food handlers always has poor practice of drying the Utensils with the used of reusable towel 100(76.3%) and the few were practicing good method of drying the Utensils as they spread on the drying rack. This supported the findings from the study conducted in Uganda during this Covid-19 pandemic which showed that most of the food handlers always were not following the food handling protocols as in the

constitution of Uganda of food and safety Act and the guidelines from the ministry of Health (Mark Raguindin Limon, 2021).

Another study conducted in Makindi division Kampala was in agreement to the findings that most of the food handlers always practice use of reusable clothes which may results into the contamination Utensils or plates which in turn transmitting the food borne infection of the plates (Ssebatta, 2016). The above findings could be due to little knowledge about food handling practices, gaps in enforcement of laws and policies by health workers and other stakeholder, lack of guidelines to the Food handlers.

Additionally, the researcher founded that majority of the respondents were practicing pit damming of waste 81(60.9%) although poor waste dumping practices was noted among some categories of people 31(25.6%) and 18(13.5%) in water drainage channels within the City. This was supported by the study conducted in Western Nigeria which revealed that, most of the food handlers were practicing open damping of waste and even in the water channels (Havelaar, et al., 2017).

On the other hand, the majority of the respondents 125(95.4%) reported that Latrines were available at their working areas where they do sells foods especially the restaurant owners.

Similarly, another study conducted in Nairobi, Kenya 2018 shown that access to toilet facility and availability of running water within the toilet facility decreased the likelihood of food contamination and (Macharia, T., Ochola, S (2018). The availability latrines in good working conditions could reduce the transmission of food borne diseases.

The availability of latrine could be as the results of continuous Hotels inspections by the district and city authority, health education and community sensitizations among the food handlers, strict laws and policies and the efforts from community leaders. In addition to that, the few food handlers 10(7.6%) were found to be associated with the poor practice of Cooking outside with was associated with high level of food contamination due to dust particles from both micro-organism or non-micro-organic particles hence promoting food contamination and food poisoning.

### **4.3. Socio-cultural factors affecting food handling practices**

The researcher founded that the majority of the respondents reported washing their hand with soap after visiting latrine 103(77.4%) although 22.6% of the food handlers reporting bad practice of not washing hands with soap after vising latrine. This agrees with the study conducted in Low- and middle-income countries about food vendors which shows that most of the food vendors lack knowledge and has bad practices of not washing their hands after visiting latrine (Nizame, F. A. (2019). This bad practice of hand washing could be associated with high rate of transmission of bacterial infections among the food handlers and people whom always depend on eating from the restaurant especially in those with poor hand washing practices embedded in the tradition.

In addition to that, high practice hand washing (77.4%) with soap realized could be associated with constant inspection of the food premises, health education, and sensitization, individual perceptions about proper hand washings after visiting latrine or toilet

However, cultural practice of eating or during while serving food was detected among the food vendors, the majority of the food vendors 63(47.4%) reported bad practice of eating or drinking while serving the customers. The study conducted in Uganda supports the findings that most of the food vendors has bad practices in food handling (Ssebatta, 2016). This could be due to the cultural beliefs and its effects on the food handling and eating habits. On the other hands, educational level

of an individual could be another factor associated with the bad habits of food handling among the food handlers hence high contamination and food borne diseases could result.

The researcher found that, majority of the respondents were storing utensils in well and arranged manner 108(81.2%), and those who reported that their utensils are always free from the dust particles were 122(91.7%). This does not agree with health survey conducted among the food handlers to investigate knowledge on personal hygiene, usage and maintenance of kitchen facilities, food storage and food handling practices, their knowledge was found to be critically low (Odeyemi, 2016). The high level of utensils storage could be due to high level of knowledge among the food handlers, strict laws and policies enforcement which was achieved through inspection of the eating premises especially road side vendors to ensure reduction in the transmission of food borne diseases

The researcher found that most of the food vendors do not wear apron or cover their head during food preparing and even while serving the customers with food 58(43.6%). The use of sanitizers in cleaning the surfaces were highly reported by almost all the study participants 120(90.2%). The recent study conducted by (Chekol, F. A., (2019) revealed that relatively low good practice of food handling practice was observed. Relatively low practice was observed in wearing clean gown and head cover, shorting of finger nails and medical. The above findings could account for most of the food borne infections which occur among food handlers and the customers. This was evidenced by Mary typhus which was associated with the bad practices of the food handlers.

### **Acknowledgment**

Special thanks go to the Almighty father who made it possible for me to come up with this study without health problems, and with minimal social constraints encountered.

Exceptional appreciation goes to my family members: Wife Adijah Sultan and Son; Omara Emmanuel; Parents: Mr. Tom Opio and Mrs. Rose Opio who constituted a lot in my academic and all my brothers and sister, all the staffs of ALPHA, Lira University staffs for nurturing me.

Therefore, I kindly request any funding organization to support my research team support my in furthering my education in the field of research.

### **References**

- [1] Ammann, J., Siegrist, M., & Hartmann, C. (2019). The influence of disgust sensitivity on self-reported food hygiene behaviour. *Food Control*, 102, 131-138.
- [2] Chekol, F. A., Melak, M. F., Belew, A. K., & Zeleke, E. G. (2019). Food handling practice and associated factors among food handlers in public food establishments, Northwest Ethiopia. *BMC research notes*, 12(1), 1-7.
- [3] Daniel, N., Casadevall, N., Sun, P., Sugden, D., & Aldin, V. (2020). The Burden of Foodborne Disease in the UK 2018.
- [4] Havelaar, A. H., Kirk, M. D., Torgerson, P. R., Gibb, H. J., Hald, T., Lake, R. J., & World Health Organization Foodborne Disease Burden Epidemiology Reference Group. (2015). World
- [5] Health Organization global estimates and regional comparisons of the burden of foodborne disease in 2010. *PLoS medicine*, 12(12), e1001923.
- [6] Macharia, T., Ochola, S., Mutua, M., & Kimani-Murage, E. (2018). Association between household food security and infant feeding practices in urban informal settlements in Nairobi, Kenya. *Journal of Developmental Origins of Health and Disease*, 9(1), 20-29. doi:10.1017/S2040174417001064.
- [7] Makita, K., Fevre, E. M., Waiswa, C., Kaboyo, W., Eisler, M. C., & Welburn, S. C. (2011). Evidence-based identification of the most important livestock related zoonotic diseases in Kampala, Uganda. *Journal of Veterinary Medical Science*, 1103290479-1103290479.

- [8] Mihalache, O. A., Dumitraşcu, L., Nicolau, A. I., & Borda, D. (2021). Food safety knowledge, food shopping attitude and safety kitchen practices among Romanian consumers: A structural modelling approach. *Food Control*, 120, 107545.
- [9] Nizame, F. A., Alam, M. U., Masud, A. A., Shoab, A. K., Opel, A., Islam, M. K., LuUnicomb, L. (2019). Hygiene in Restaurants and among Street Food Vendors in Bangladesh, *The American Journal of Tropical Medicine and Hygiene*, 101(3), 566-575. Retrieved May 30, 2021, from <https://www.ajtmh.org/view/journals/tpmd/101/3/article-p566.xml>.
- [10] Odeyemi, O. A. (2016). Public health implications of microbial food safety and foodborne diseases in developing countries. *Food & Nutrition Research*, 60(1), 29819. <https://doi.org/10.3402/fnr.v60.29819>.
- [11] Odeyemi, O. A., Sani, N. A., Obadina, A. O., Saba, C. K. S., Bamidele, F. A., Abughoush, M., ... & Aberoumand, A. (2019). Food safety knowledge, attitudes and practices among consumers in developing countries: An international survey. *Food research international*, 116, 1386-1390.
- [12] Tessema, A.G., Gelaye, K.A. & Chercos, D.H. Factors affecting food handling Practices among food handlers of Dangila town food and drink establishments, North West Ethiopia. *BMC Public Health* 14, 571 (2014). <https://doi.org/10.1186/1471-2458-14-571>.
- [13] Thaivalappil, A., Waddell, L., Greig, J., Meldrum, R., & Young, I. (2018). A systematic review and thematic synthesis of qualitative research studies on factors affecting safe food handling at retail and food service. *Food control*, 89, 97-107.
- [14] World Health Organization (Ed.). (2015). *WHO estimates of the global burden of foodborne diseases*. Geneva, Switzerland: World Health Organization.
- [15] World Health Organization. (2015). WHO estimates of the global burden of foodborne diseases: foodborne disease burden epidemiology reference group 2007-2015. World Health Organization.
- [16] Avtar Singh Bimbraw. (2021). Impact of Tillage Systems on Economics and System Productivity of Forage Crops-Wheat systems. *Journal of Agricultural and Food Chemical Engineering*, 1(1), 26–40.