



Nile University  
Faculty of Medicine  
Community Medicine Department  
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Student's Research Project in Public Health

**Knowledge, Attitude and Practice of Food Handlers  
toward Compliance with Food Safety Measures in Hey  
Algamaa and Hey Alhuda Restaurants, SharqElneel  
Locality December 2018–November 2019**

Group 21

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**List of abbreviations:**

| <b>Abbreviation</b> | <b>Stand for</b>                          |
|---------------------|---|
| FAO                 | Food and agriculture organization         |
| FBI                 | Food borne illness                        |
| FH                  | Food Handlers                             |
| KAP                 | Knowledge ,Attitude and Practice          |
| MBBS                | Bachelor of Medicine, Bachelor of Surgery |
| MS                  | Master Degree                             |
| SPSS                | Statistical package for social sciences   |

## **Dedication**

We dedicate this research to our parents, who were a great source of inspiration, support and taught us to trust in Allah, believe in hard work and that so much could be done with little.

## **Acknowledgement**

We are deeply grateful to our college staff personalized in the dean MOHAMMED SUKKER AND DEPARTMENT OF COMMUNITY who been in close contact with us, answering our questions and guiding us in each step on the road. And also we want to thank everyone who participated in this research, and our colleges who work very hard.

Finally, we want to thank DR Sara Badawi Mahmoud for all the time that she gave us and for her useful comments.

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## **Abstract**

Background: Food handlers with poor hygiene, lack of training and poor knowledge, attitude and practice of food safety measures can be a source of many diseases.

The objectives: To assess the knowledge, attitude and practice of food handlers toward compliance with food safety measures in Hay Algamaa and Hey alhuda Restaurants, ShareqElneel Locality, December 2018–November 2019.

Method: Face-to-face interviews were conducted within the random sample of 70 food handlers, using a structured questionnaire to collect data about personal data, knowledge, attitude, practice and personal hygiene. A checklist was used to test practice and attitude of food handlers. Data were analyzed using SPSS program.

Results: Out of 70the respondents (70%) had good knowledge about food safety measures, (88.9%) had a good attitude, (51.4%) with Average practice.

Conclusion: Most of food handlers had good and average knowledge and attitude towards food safety measure respectively, therefore continuous Training of FH about food safety measures, and regular checkup will enhance food safety system in Sudan.

## خلاصة البحث

يمكن أن يكون مناوولوا الغذاء الذين يعانون من سوء النظافة ونقص التدريب وضعف المعرفة والسلوك والممارسة المتعلقة بسلامة الأغذية ، مصدرًا للكثير من الأمراض.

الأهداف: تقييم معرفة،سلوك وممارسات العاملين في مجال الأغذية تجاه الامتثال لتدابير سلامة الأغذية في مطاعم حي الجامعة وحي الهدى ، محلية شرق النيل. بحلول ديسمبر 2018 - نوفمبر 2019.

الطريقة: أجريت المقابلات وجهاً لوجه ضمن العينة العشوائية التي تضم 70 من مناولي الطعام ، باستخدام استبيان منظم لجمع البيانات حول البيانات الشخصية والمعرفة والسلوك والممارسة والنظافة الشخصية. و أيضاً قد تم استخدام قائمة فحص لاختبار ممارسة مناولي الطعام. ثم تم تحليل البيانات باستخدام برنامج SPSS.

النتائج: من بين 70 من المستطلعين (70%) لديهم معرفة جيدة بتدابير سلامة الأغذية ، (88.9%) لديهم سلوك جيد ، (51.4%) ملتزمين بالممارسة لهذه التدابير.

خاتمة: معظم مناولي الأغذية لديهم معرفة و سلوك جيد تجاه تدابير سلامة الأغذية ، وبالتالي فإن التدريب على سلامة الأغذية المستمر والفحص لمناولي الأغذية سيعزز نظام سلامة الأغذية في السودان.

# Chapter 1

## 1.1. Introduction and Background

Food safety is a scientific discipline describing handling, preparation, and storage of food in ways that prevent food-borne illness. <sup>(1)</sup>

Food safety is a critical component for sustainable development. Safer food contributes to fewer illness and hence increased productivity and improved livelihood.

The WHO golden rules for safe food preparation is to choose safe food, cook food thoroughly, eat cooked foods immediately, store cooked food carefully, reheat cooked foods thoroughly, avoid contact between raw foods and cooked foods, wash hands repeatedly, keep kitchen surfaces clean, protect foods from insects, rodents and other animals and use safe water. <sup>(2)</sup>

Access to sufficient amount and safe, nutritious food is key to sustaining life and promoting good health. Unsafe food containing harmful bacteria, viruses, parasites or chemical substances, causes more than 200 diseases—ranging from diarrhea to cancers. <sup>(3)</sup>

Food-borne illnesses (FBI) are an important public health problem. Food safety is a critical issue in our country with reports of outbreaks of FBI every year resulting in substantial costs to individuals, health care system and the country. There are many hurdles on the road to food safety. Food contamination can occur at any stage from production to consumption i.e. from 'Farm to Fork' Food handlers are an important link in the chain from kitchen to fork. They are involved in preparation of raw material, cooking, packing, storing, displaying and serving of food. <sup>(4)</sup>

Food service establishments and food handlers are sources of food-borne illnesses when hygienic measures are ignored by food handlers, this may enable bacteria to multiply causing illness, and may lead to death. The practice of good personal hygiene and the adoption of safety measures is one of the most important reasons to prevent the transmission of pathogens from food handlers to consumers. <sup>(5)</sup>

## **1.2. Problem Statement:**

Food borne illness is a major public health problem in the United States and globally. Both the developed and developing countries suffer the consequences of food-borne illness, but to varying degrees <sup>(6)</sup>.

It is estimated that 600 million-almost 1 in 10 people in the world-fall ill after eating contaminated food and about 420 000 die every year. Children under 5 years of age carry 40% of the food-borne disease burden, Diarrheal diseases are the most common illnesses resulting from the consumption of contaminated food, causing 550 million people to fall ill and 230 000 die every year. <sup>(7)</sup>

## **1.3. Rationale/justification:**

Food borne disease has extensive economic and emotional burdens. Which it directly influence by FH compliance with food safety measures. Lack of knowledge or incorrect application of hygienic sound practice of food handler has strong impact on food safety and community health. Moreover, it considered a leading cause of food-borne disease.

Studying knowledge, attitude and practice of FH about food safety measures, and their compliance with these measures to find the gaps,

Discovering of these gaps significantly contribute in initiation of prevention and promotion programs to compete them.

## Chapter 2: Literature review

Temesgen *et al* conducted a Study in Wolkite University cafeteria, Southern Ethiopia from December 2016 to February 2017. The study was done among food handlers to assess knowledge and attitude of food handlers, then data was collected by face-to-face interview using structured questionnaire.

The study encompassed 170 food handlers, of which 149 were females (149/170, 87.6%) or (301/340, 88.5%), whose age ranged from 18 to 57 years with an average of 26.5 years. Out of the total study participants, 61.8% of them were worked for 2-3 years. Of all food handlers, 112 (65.9%) had the habit of hand washing after toilet, of which 37.5% washed with soap and water whereas majority, 62.5% of the participants used water only. Of the total food handlers, about 84 (49.4%) and 87 (51.2%) had a habit of hand washing after touching dirty objects and before eating food, respectively. Results of the study reveals that most of food handlers had average knowledge and attitude about food safety. <sup>(8)</sup>

Also another study was conducted in FH, Ghana by Fortune *et al* from 2014 to 2017 about Food safety knowledge, attitudes and practices of institutional food-handlers. The study was conducted using a descriptive, cross-sectional survey of 29 institutions by face-to-face interview and administration of questionnaire to two hundred and thirty-five (235) institutional food-handlers.

Majority of the food-handlers were between 41-50 years (39.1%). Female respondents were (76.6%). the food-handlers were knowledgeable about hygienic practices, cleaning and sanitation procedures. Almost all the food-handlers were aware of the critical role of general sanitary practices in the work place, such as hand washing (98.7% correct answers), using gloves (77.9%), proper cleaning of the instruments/utensils (86.4%) and detergent use (72.8%). food-handlers in Ghana had satisfactory knowledge in the areas of food safety, general and personal hygiene, cleaning and sanitation procedures. However, this did not translate into strict food hygiene practices. <sup>(9)</sup>

On the other hand, Ab.Hamid *et al* conducted a study in restaurants workers in Putrajaya, Malaysia (2014). The study is

about Assessment of Knowledge, Attitude and Practices Concerning Food Safety among Restaurant Workers in Putraja. Data has been collected by face-to-face interview using structured questionnaire.

Generally, the knowledge of the respondents was good with the mean score 90.3 (possible score 100) and the benchmark set for this study was at 85. The finding suggested there were positive relationships between both knowledge and attitude; knowledge and practice.

Similar finding was recorded by Norrakiah & Siow (2014) which found that a significant positive correlation was observed between knowledge and attitudes, knowledge and practices and attitudes and practices ( $p < 0.05$ ).<sup>(10)</sup>

While there was study done in male FH in restaurants of King Saud University, Saudi Arabia by Nasser Abdulatif & Fohad Mabood January 2016. about food safety knowledge, attitude and practice of male food handlers in restaurants of King Saud University. In socio-demographic characteristics of 87-food handler's all the respondents were males with (55.2%) aged between 26 and 35 years. In education level, only four respondents did not have formal education and 71 respondents (63.4%) were secondary school leavers. While around (65.5%) have been in this sector for 1-5 years, 14 workers had experience ranging from 11 to 20 years while only 3 people (3.4%) have worked for over 20 years. Also it was found that most of respondents attended training related to food safety and just (5.7%) had no previous training. About 97.9% of the respondents had their cards. Most of the respondents (80.2%) answered questions related to personal hygiene correctly. Good percentage of employees answered correctly about cross contamination (63.4%) and definition of foodborne illness (65.75%). the respondents had least knowledge about the temperature and time control (44.8%) it was found that respondents have extremely good personal hygiene practices whereby (96.6%) maintained safe practices such as wearing uniforms and caps most of the handlers (95.4%) washed hands after smoking, coughing, sneezing and majority of the respondents (75.95) removed personal stuffs like watches, rings and jewelry that can contaminate food while working.<sup>(11)</sup>

## **Chapter 3: Objectives**

### **3.1. General Objective**

To assess the knowledge, attitude and practice of food handlers toward compliance with food safety measures in the at Hay Algamaa and Hey Alhuda restaurants, Shareq Elneel Locality, December 2018–November 2019.

### **3.2. Specific Objectives**

1. To assess the knowledge of food handlers toward compliance with food safety measures at Hay Algamaa and hey alhuda restaurants, Shareq Elneel Locality, December 2018–November 2019.

2. To assess the practice of FH, and their attitude towards compliance with food safety measures in restaurants at Hay Algamaa and hey alhuda, Shareq Elneel Locality, December 2018–November 2019.

## Chapter 4: Methods and Materials

### 4.1. Study design:

Observational, descriptive cross-sectional study.

### 4.2. Study area:

The study was conducted in in Hey Algamaa and Hey Alhuda Restaurants, Sharq Elneel Locality. In Khartoum north town, one of the three towns in Khartoum state.

In this area there are seventeen restaurants, two universities, fives schools, two hospitals, five Hostels and one police station. (Map of the area provided in annex 1)

### 4.3. Study population:

The study population composed of food handlers working in hey algamaa and hey alhuda restaurants, sharq Elneel Locality.

Inclusion and Exclusion criteria:

Inclusion criteria:

The study included all Sudanese and non-Sudanese's FH, working for six-month duration or more at hey algamaa and hey alhuda restaurants, sharq Elneel Locality. It included all FH with valid or invalid health card, accepted to participate in the study.

Exclusion criteria working out at the study area and refused to participate.

**4.4. Sample Size:** the formula was used to estimate the sample size:

$$4.4.1. \quad n = \frac{NZ^2 p (1-p)}{d^2 (N-1) + Z^2 P (1-p)}$$

#### 4.4.2.

n is the sample size.

z= 1.96, is the value of normal curve corresponding to level of confidence 95%.

N =109 target population from seventeen restaurants.

P = 0.5, is the probability of target group having the problem or prevalence rate.

1-p is the probability of target group not having the problem.

D = 0.05, is the desired margin of error.

$$4.4.3. n = \frac{109 \times 1.962 \times 0.5 \times (1-0.5)}{(0.05)^2 \times (109-1) + 1.962 \times 0.5(1-0.5)}$$

$$n = \frac{53.464}{0.76} = 70.347$$

n = 70 food handlers

#### **4.5. Sampling technique:**

Simple random technique was used for Selection of FH from seventeen restaurants.

#### **4.6. Data Management:**

##### **4.6.1. Data collection tools:**

Face-to-face interviews were conducted to collect data from 70 FH, through simple random technique, using a structured pretested questionnaire (annex 2&3), to collect personal data, knowledge, attitude, practice data. A checklist was also used to collect data about attitude (annex 4&5). After taking an information consent, (annex 6&7).

Three data collectors were trained for one day for collection of the data (Annex 2&3).

##### **4.6.2. Data analysis:**

Data was being analyzed using a statistical package from social science (SPSS) computer program (calculating mean, median mode percentage and chi square for association) version 24.

#### **4.7. Ethical consideration:**

Ethical approval from Nile College Community Medicine Department was obtained. Written consent from participant (FH) was also obtained Annex (6, 7). After a brief explanation about the aim and outcome of the study and that, the data will be kept confidential.

## Chapter 5: The results

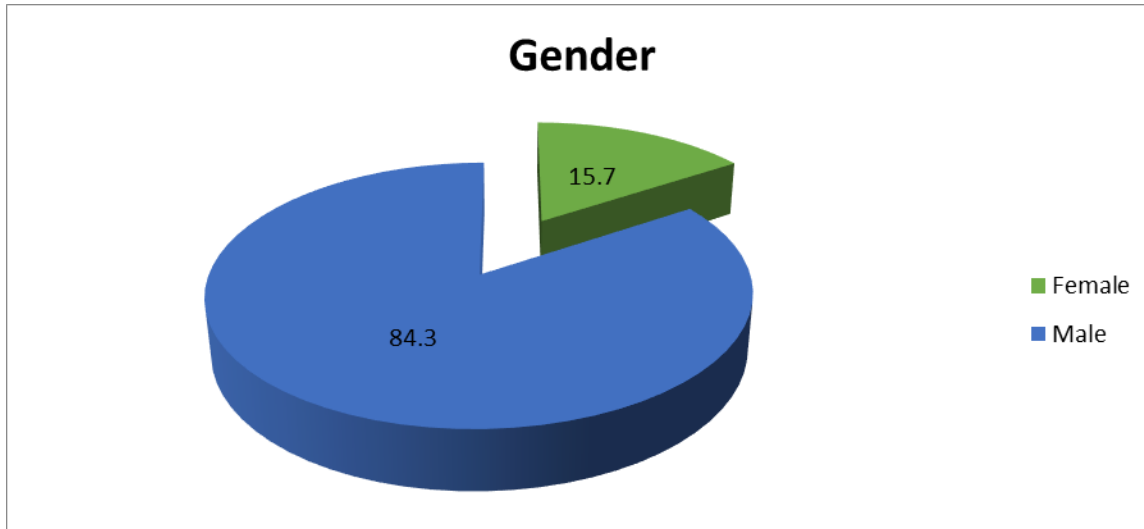
Table 5.1: Age groups of FH in restaurants at Hey Algamaa and Hey Alhuda, Sharq Elneel Locality, December 2018 - November 2019.

It was found that most of the food handlers (57.1%) were in the age group 20-30 years.

n=70

| Age   |                    | Frequency | Percent |
|-------|--------------------|-----------|---------|
| Valid | Less than 20 years | 14        | 20.0    |
|       | 20 - 30 years      | 40        | 57.1    |
|       | 30 - 40 years      | 10        | 14.3    |
|       | 40 - 50 years      | 6         | 8.6     |
|       | Total              | 70        | 100.0   |

n=70



**Figure 5.1: Gender of FH in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 –November 2019.**

**Most of the respondents were males (84.3%).**

**Table 5.2: Educational level of FH in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

**The most of the food handler's educational level in Hey Algamaa and Hey Alhuda, Sharqalneel Locality is university level (34.3%).**

**n=70**

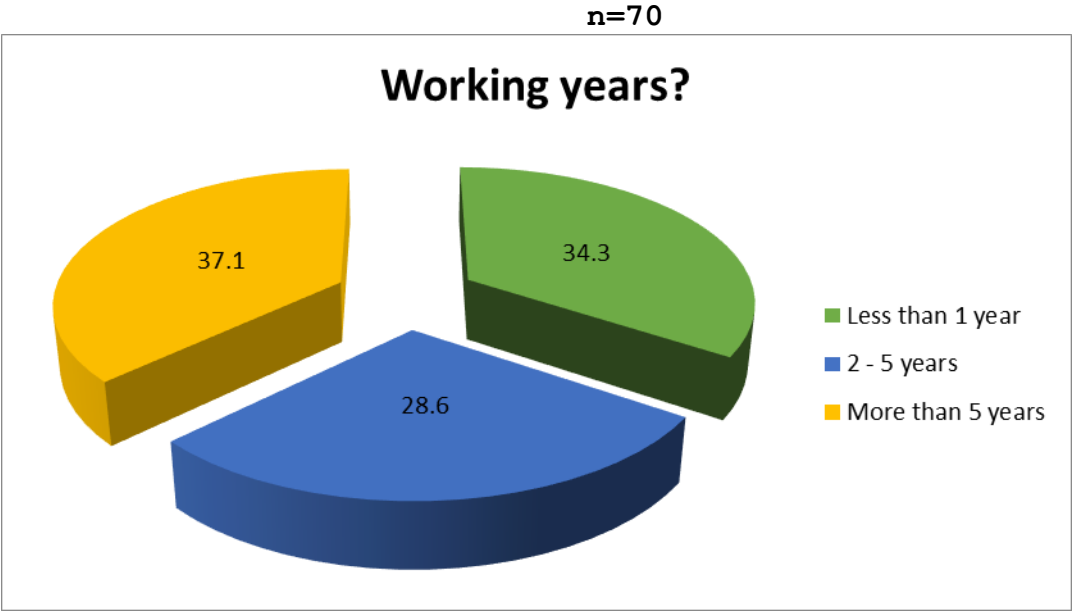
| Educational level   | Frequency | Percent |
|---------------------|-----------|---------|
| Illiterate          | 5         | 7.1     |
| Khalwa              | 5         | 7.1     |
| Primary school      | 9         | 12.9    |
| Intermediary school | 5         | 7.1     |
| Secondary school    | 21        | 30.1    |
| University          | 24        | 34.3    |
| Post graduate study | 1         | 1.4     |
| Total               | 70        | 100.0   |

**Table 5.3: Nationality of FH in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 –November 2019.**

**Majority of workers (55.7%) were Sudanese.**

**n= 70**

| Nationality | Frequency | Percentage |
|-------------|-----------|------------|
| Sudanese    | 39        | 55.7%      |
| Eritreans   | 22        | 31.5%      |
| Syrians     | 9         | 12.8%      |
| Total       | 70        | 100%       |



**Figure 5.2:**

**Duration of Work among FH in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 –November 2019.**

**Most of food handlers’s duration work for more than 5 years (37.1%) .**

n=70

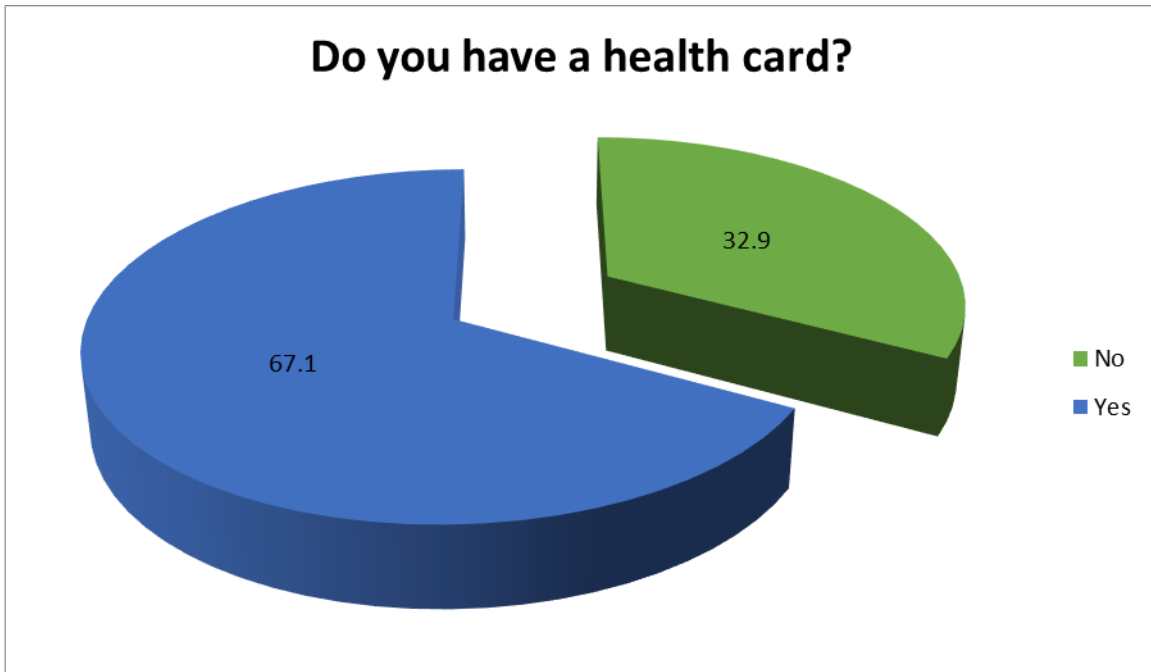


Figure 5.3: Food handlers who have health card FH restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.

Most of food handlers have health card (67%).

n=70



**Figure 5.4: Food handlers who have been trained about food safety measures in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

**Most of the respondents have no trained about food safety before (54%).**

n =70



Figure 5.5: Knowledge of hand washing practice of FH in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 –November 2019.

Most of the food handlers know the importance of hand washing (95.7%).

n=70



**Figure 5.6: Hand washing practice of FH in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 – November 2019.**

**Most of the FH wash their hand after touching uncooked food, after touching their hair and before start preparing food (58.6%)**

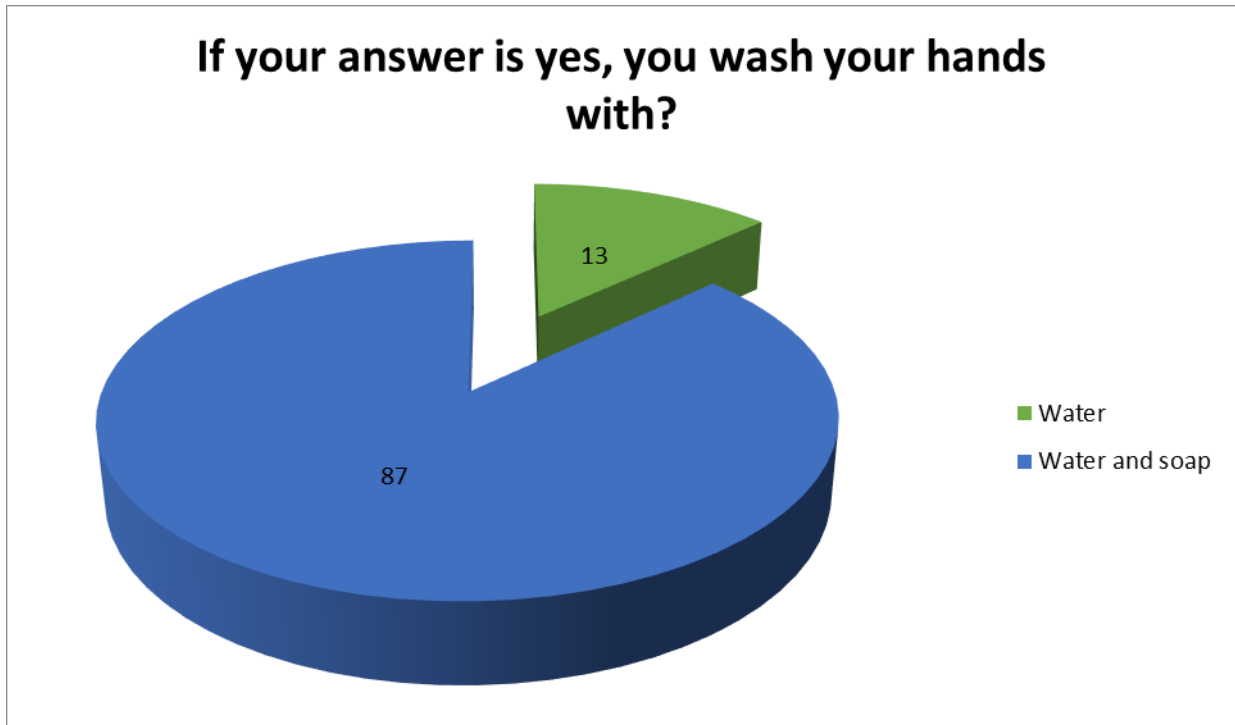
n=70



**Figure 5.7: Hand washing practice of FH in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 - November 2019.**

The majority of food handlers 98.6% wash their hands after using the bathroom.

n=70



**Figure 5.8: Practice of hand washing with water and soap of FH in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 –November 2019.**

**About 87% wash their hands by water and soap.**

n=70

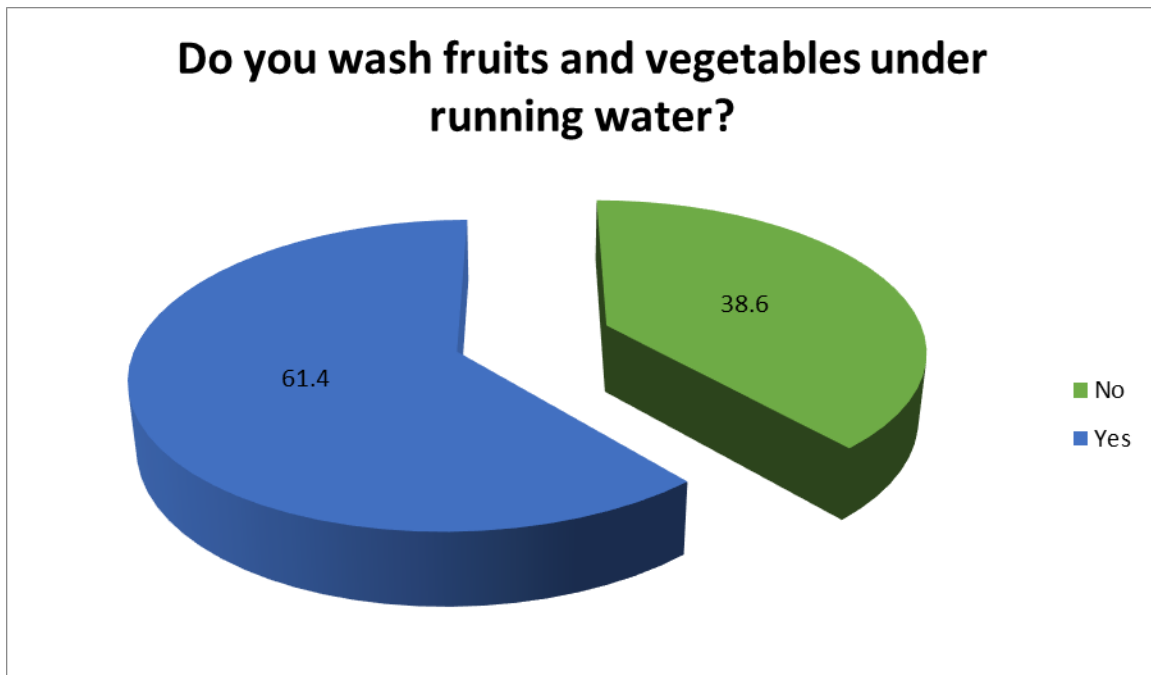
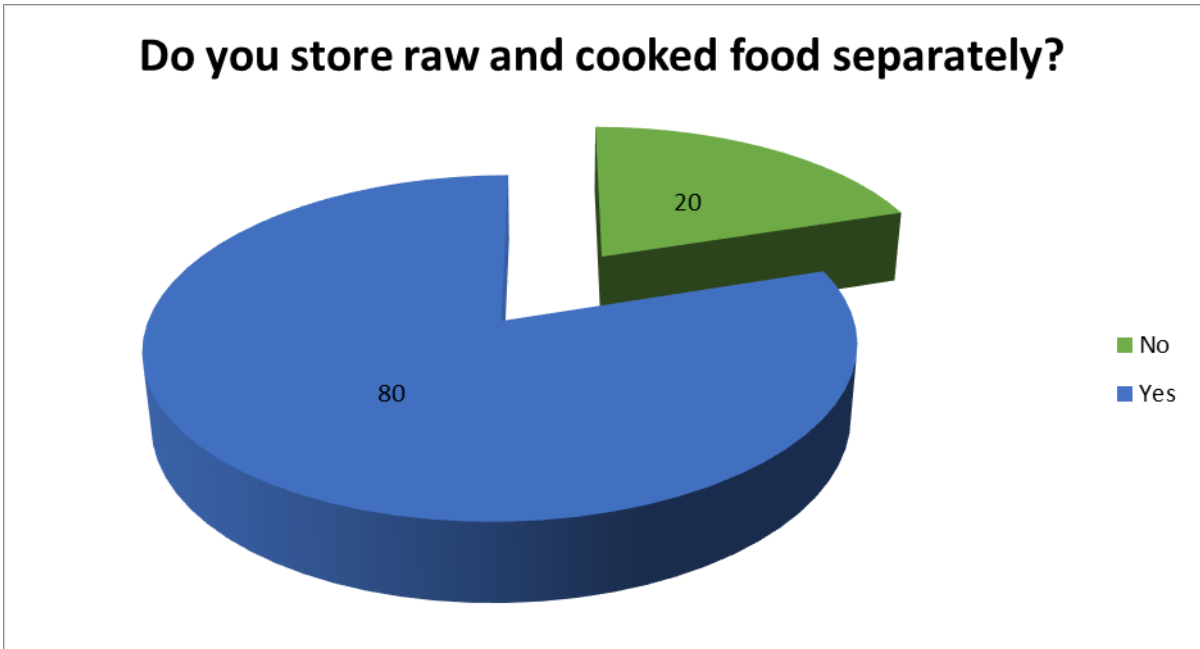


Figure 5.9: Washing fruits and vegetables under running water in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.

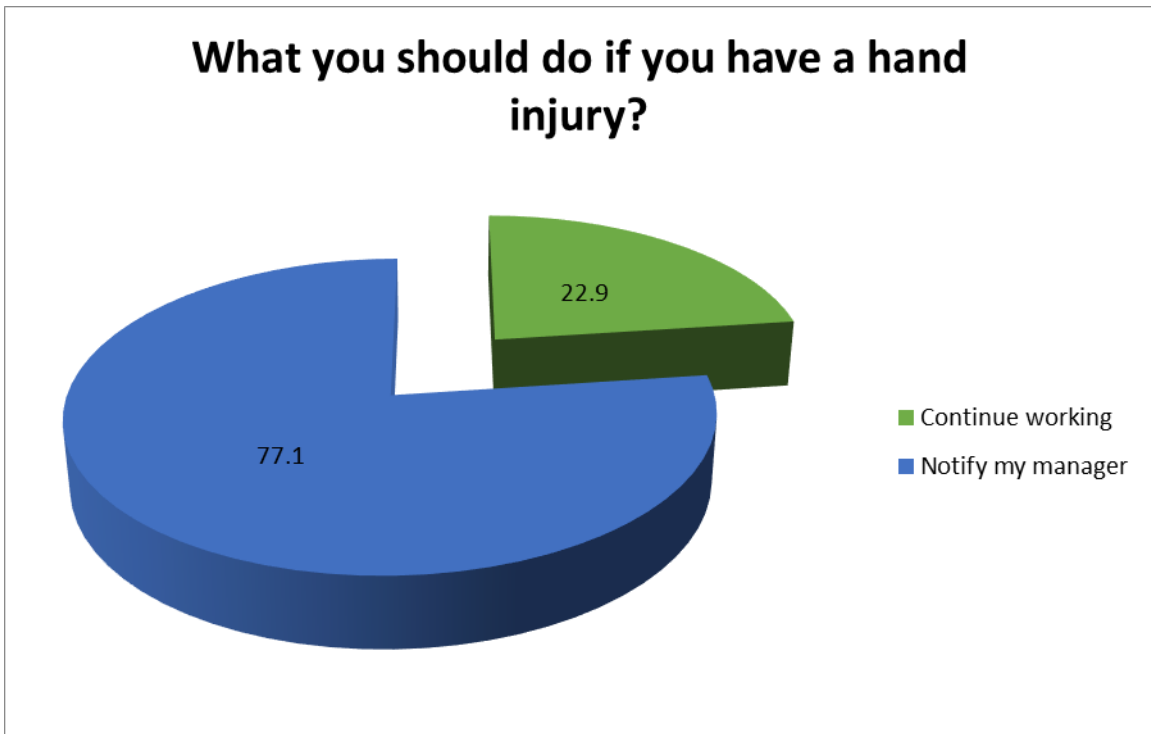
61.4% of food handlers wash fruits and vegetables under running water.



n=70

**Figure 5.10: Practice of food storage, raw and cooked, of FH in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

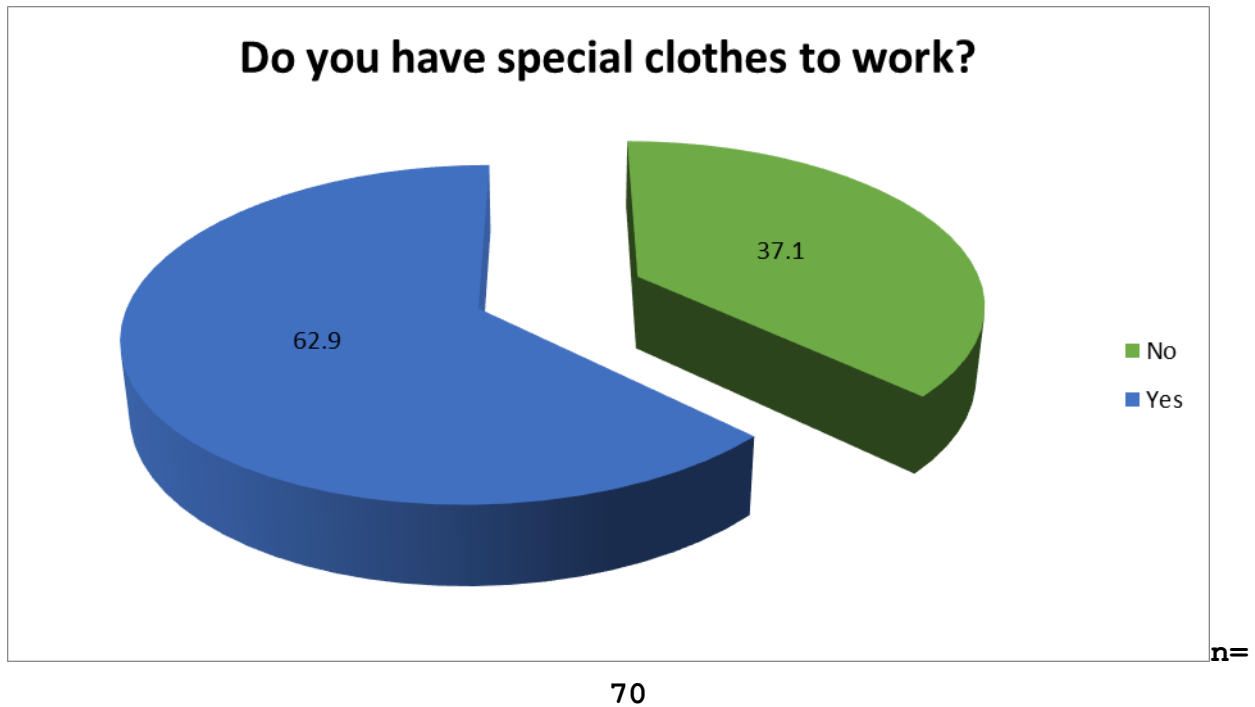
**About 80% of the food handlers store raw and cooked food separately.**



n=70

**Figure 5.11: Practice of FH if has get hand cut wound in work place. in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 –November 2019.**

Out of 70 food handlers 77.1% notify their manager when they had injury.



**Figure 5.12: Food handlers who have special clothes for work in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 –November 2019.**

**About (62.9%) of food handlers have special clothes for work.**

n=70

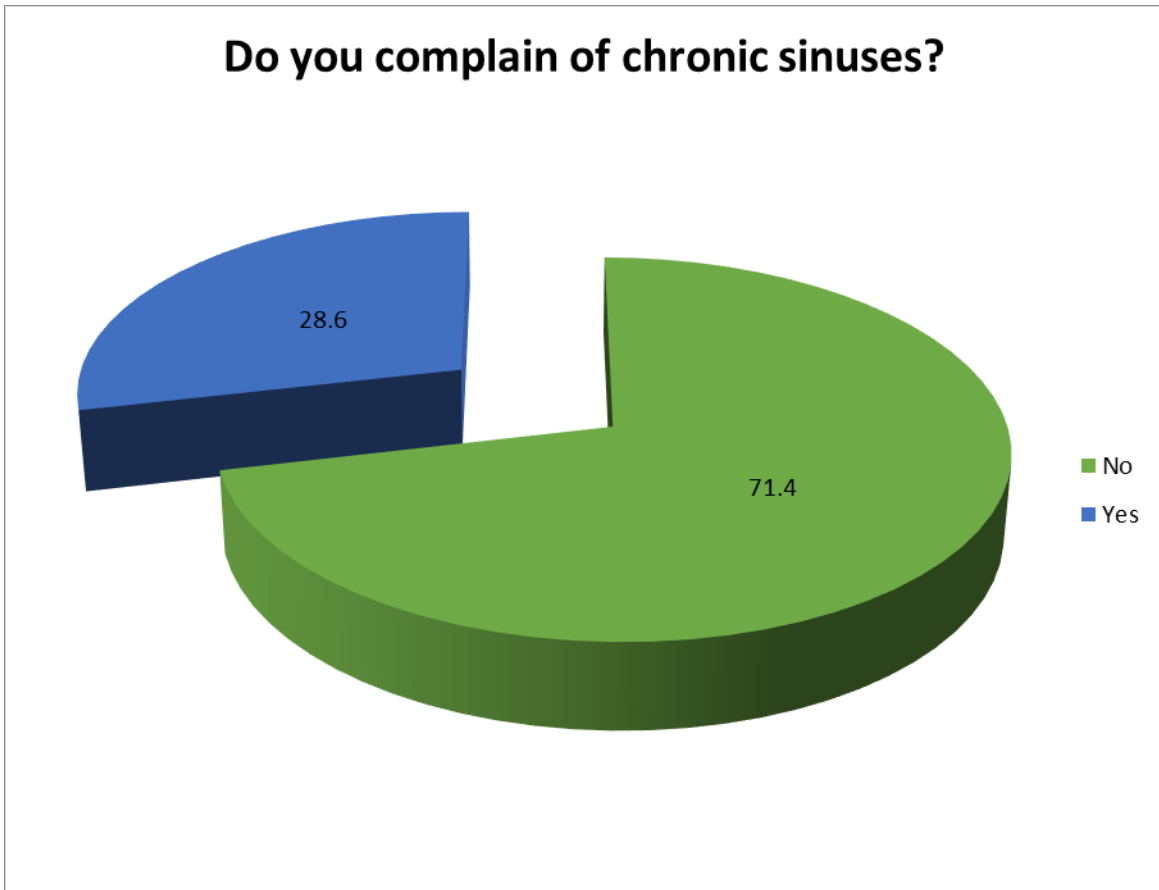
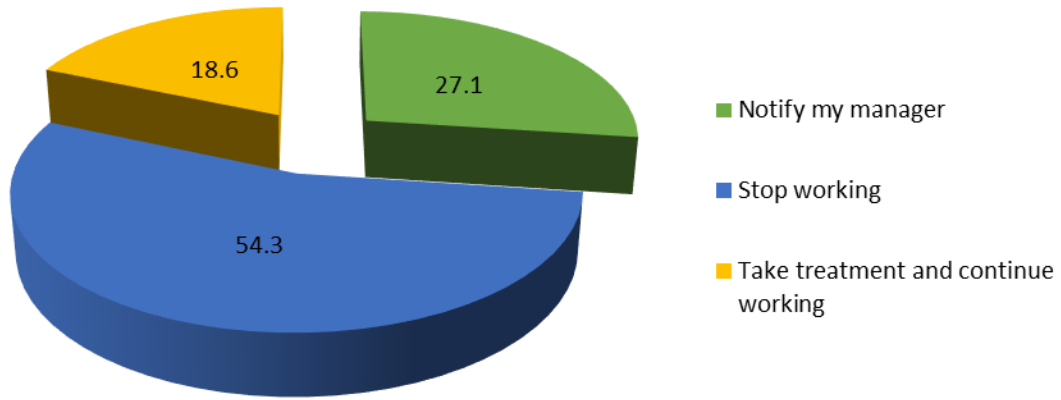


Figure 5.13: Food handlers with chronic sinuses, in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.

71.4% not complaining from chronic sinuses.

### How you should behave if you have diarrhea, vomiting or sore throat?



n=70

Figure 5.14: Practice of FH if has get diarrhea, vomiting or sore throat. in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.

Majority of FH take treatment and stop working.

**Table 5.4: Wearing jewelry, rings and put head cap in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

**61.4% of food handlers do not put jewelry or rings  
Moreover, 68.6% of them have not wearing head cap.**

**n=70**

|       |                      | Frequency | Percent |
|-------|----------------------|-----------|---------|
| Valid | jewelry, rings<br>No | 43        | 61.4    |
|       | Yes                  | 27        | 38.6    |
|       | Total                | 70        | 100.0   |
|       | Head cap<br>wearing  | 22        | 31.4    |
|       | Not wearing          | 48        | 68.6    |
|       | total                | 70        | 100.0   |

**Table 5.5:Nails presence in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

**Most of FH with short nail 75.7%. in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

**n=70**

|       |       | Frequency | Percent |
|-------|-------|-----------|---------|
| Valid | Short | 53        | 75.7    |
|       | Tall  | 17        | 24.3    |
|       | Total | 70        | 100.0   |

**Table 5.6: Presence of wound in the hands of FH in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

**Majority of the respondents had no wounds in their hands 81.4%**

n=70

|       |       | Frequency | Percent |
|-------|-------|-----------|---------|
| Valid | No    | 57        | 81.4    |
|       | Yes   | 13        | 18.6    |
|       | Total | 70        | 100.0   |

**Table 5.7: Covered wound of FH in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

**As table show 69.2% of hand wounds covered.**

n=70

|       |       | Frequency | Percent |
|-------|-------|-----------|---------|
| Valid | No    | 4         | 30.8    |
|       | Yes   | 9         | 69.2    |
|       | Total | 13        | 100.0   |

**Table 5.8: FH wearing gloves in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 - November 2019.**

**Most of the food handlers not wear gloves 71.4%**

**n=70**

|       |             | Frequency | Percent |
|-------|-------------|-----------|---------|
| Vali  | Not wearing | 50        | 71.4    |
| d     | Wearing     | 20        | 28.6    |
| Total |             | 70        | 100.0   |

**Table 5.9: FH who Wearing uniforms in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

**54.3% of workers put uniform**

**n=70**

|       |             | Frequency | Percent |
|-------|-------------|-----------|---------|
| Vali  | Not wearing | 32        | 45.7    |
| d     | Wearing     | 38        | 54.3    |
| Total |             | 70        | 100.0   |

**Table 5.10: Cleance of work uniform of FH in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

**And 58.6% of uniforms are clean**

**n=70**

|       |       | Frequency | Percent |
|-------|-------|-----------|---------|
| Valid | No    | 29        | 41.4    |
|       | Yes   | 41        | 58.6    |
|       | Total | 70        | 100.0   |

**Table 5.11: FH Wearing of work shoes in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

**And also found 60% of food handlers do not wearing work shoes**

**n=70**

|       |             | Frequency | Percent |
|-------|-------------|-----------|---------|
| Valid | Not wearing | 42        | 60.0    |
|       | Wearing     | 28        | 40.0    |
|       | Total       | 70        | 100.0   |

**Table 5.12: Cleance of restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

As table show the percentage of clean restaurants is 61.4%

n=70

|           | Frequency | Percent |
|-----------|-----------|---------|
| Clean     | 43        | 61.4    |
| Not clean | 27        | 38.6    |
| Total     | 70        | 100.0   |

**Table 5.13: Covering of the food from insect in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

About 74.3% of food covered

n=70

|         | Frequency | Percent |
|---------|-----------|---------|
| Vali No | 18        | 25.7    |
| d Yes   | 52        | 74.3    |
| Total   | 70        | 100.0   |

**Table 5.14: Smoking among FH in restaurants during work in Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

Majority of food handlers not smoking during work 84.3

n=70

|         | Frequency | Percent |
|---------|-----------|---------|
| Vali No | 59        | 84.3    |
| d Yes   | 11        | 15.7    |
| Total   | 70        | 100.0   |

**Table 5.15: Snuffing among FH in Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 –November 2019**

About 85.7% of respondents not snuffing

n=70

|       | Frequency | Percent |
|-------|-----------|---------|
| No    | 60        | 85.7    |
| Yes   | 10        | 14.3    |
| Total | 70        | 100.0   |

**Table 5.16: Water source in work place at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 –November 2019.**

Majority with network water source 64.3%

n=70

|                    | Frequency | Percent |
|--------------------|-----------|---------|
| Valid From network | 45        | 64.3    |
| Stored             | 25        | 35.7    |
| Total              | 70        | 100.0   |

**Table 5.17: Availability of hand washing basin in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

Majority have basin and used 64.3%

n=70

|                        | Frequency | Percent |
|------------------------|-----------|---------|
| Available and used     | 45        | 64.3    |
| Available but not used | 14        | 20.0    |
| Not available          | 11        | 15.7    |
| Total                  | 70        | 100.0   |

**Table 5.18: Method of tools washing in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

Usage of water and soap is most 94.3

n=70

|                  | Frequency | Percent |
|------------------|-----------|---------|
| Vali Water only  | 4         | 5.7     |
| d Water and soap | 66        | 94.3    |
| Total            | 70        | 100.0   |

**Table 5.19: Health card is valid in restaurants at Hey Algamaa and Hey Alhuda, Sharqalneel Locality, December 2018 -November 2019.**

**52.9%food handlers have no valid health card**

**n=70**

|       |       | Frequency | Percent |
|-------|-------|-----------|---------|
| Valid | No    | 37        | 52.9    |
|       | Yes   | 33        | 47.1    |
|       | Total | 70        | 100.0   |

**Table 5.20: Knowledge of food handlers toward compliance with food safety measures**

**n=70**

|       |         | Frequency | Percent |
|-------|---------|-----------|---------|
| Valid | Average | 16        | 22.9    |
|       | Good    | 49        | 70.0    |
|       | Poor    | 5         | 7.1     |
|       | Total   | 70        | 100.0   |

**Table 5.21: Attitude of food handlers toward compliance with food safety measures**

**n=70**

|       |       | Frequency | Percent |
|-------|-------|-----------|---------|
| Valid | Bad   | 12        | 17.1    |
|       | Good  | 58        | 82.9    |
|       | Total | 70        | 100.0   |

**Table 5.22: Practice of food handlers toward compliance with food safety measures**

**n=70**

|       |         | Frequency | Percent |
|-------|---------|-----------|---------|
| Valid | Average | 36        | 51.4    |
|       | Good    | 24        | 34.3    |
|       | Poor    | 10        | 14.3    |
|       | Total   | 70        | 100.0   |

**Table 5.23: Age \* Knowledge of food handlers toward compliance with food safety measures**

Chi-square value = 11.381a, df = 6, P-value = .077  
(Not significant).

n=70

|                    |            | Knowledge of food handlers toward compliance with food safety measures |       |      | Total  |
|--------------------|------------|--|-------|------|--------|
|                    |            | Average  | Good  | Poor |        |
| Age 20 - 30 years  | Count      | 8  | 31    | 1    | 40     |
|                    | % of Total | 11.4%  | 44.3% | 1.4% | 57.1%  |
| 30 - 40 years      | Count      | 3  | 7     | 0    | 10     |
|                    | % of Total | 4.3%   | 10.0% | 0.0% | 14.3%  |
| 40 - 50 years      | Count      | 0  | 5     | 1    | 6      |
|                    | % of Total | 0.0%   | 7.1%  | 1.4% | 8.6%   |
| Less than 20 years | Count      | 5  | 6     | 3    | 14     |
|                    | % of Total | 7.1%   | 8.6%  | 4.3% | 20.0%  |
| Total              | Count      | 16   | 49    | 5    | 70     |
|                    | % of Total | 22.9%  | 70.0% | 7.1% | 100.0% |

**Table 5.24: Age \* Attitude of food handlers toward compliance with food safety measures**

Chi-square value = 6.303a, df = 3, P-value = .098  
(Not significant)

n=70

|       |                    |            | Attitude of food handlers toward compliance with food safety measures |       | Total  |
|-------|--------------------|------------|---|-------|--------|
|       |                    |            | Bad   | Good  |        |
| Age   | 20 - 30 years      | Count      | 4   | 36    | 40     |
|       |                    | % of Total | 5.7%  | 51.4% | 57.1%  |
|       | 30 - 40 years      | Count      | 4   | 6     | 10     |
|       |                    | % of Total | 5.7%  | 8.6%  | 14.3%  |
|       | 40 - 50 years      | Count      | 2   | 4     | 6      |
|       |                    | % of Total | 2.9%  | 5.7%  | 8.6%   |
|       | Less than 20 years | Count      | 2   | 12    | 14     |
|       |                    | % of Total | 2.9%  | 17.1% | 20.0%  |
| Total |                    | Count      | 12  | 58    | 70     |
|       |                    | % of Total | 17.1%   | 82.9% | 100.0% |

**Table 5.25: Age \* Practice of food handlers toward compliance with food safety measures**

Chi-square value = 16.421a, df = 6, P-value = .012 (significant)

n=70

|                    |            | Practice of food handlers toward compliance with food safety measures |       |       | Total  |
|--------------------|------------|---|-------|-------|--------|
|                    |            | Average   | Good  | Poor  |        |
| Age 20 - 30 years  | Count      | 18  | 18    | 4     | 40     |
|                    | % of Total | 25.7%   | 25.7% | 5.7%  | 57.1%  |
| 30 - 40 years      | Count      | 2   | 4     | 4     | 10     |
|                    | % of Total | 2.9%  | 5.7%  | 5.7%  | 14.3%  |
| 40 - 50 years      | Count      | 5   | 1     | 0     | 6      |
|                    | % of Total | 7.1%  | 1.4%  | 0.0%  | 8.6%   |
| Less than 20 years | Count      | 11  | 1     | 2     | 14     |
|                    | % of Total | 15.7%   | 1.4%  | 2.9%  | 20.0%  |
| Total              | Count      | 36  | 24    | 10    | 70     |
|                    | % of Total | 51.4%   | 34.3% | 14.3% | 100.0% |

**Table 5.26: Gender \* Knowledge of food handlers toward compliance with food safety measures**

Chi-square value = 1.317a, df = 2, P-value = .518  
(not significant)

n=70

|        |        | Knowledge of food handlers toward compliance with food safety measures |       |       | Total |        |
|--------|--------|--|-------|-------|-------|--------|
|        |        | Average  | Good  | Poor  |       |        |
| Gender | Female | Count  | 2     | 9     | 0     | 11     |
|        |        | % of Total   | 2.9%  | 12.9% | 0.0%  | 15.7%  |
|        | Male   | Count  | 14    | 40    | 5     | 59     |
|        |        | % of Total   | 20.0% | 57.1% | 7.1%  | 84.3%  |
| Total  |        | Count  | 16    | 49    | 5     | 70     |
|        |        | % of Total   | 22.9% | 70.0% | 7.1%  | 100.0% |

**Table 5.27: Gender \* Attitude of food handlers toward compliance with food safety measures**

Chi-square value = .596a, df = 1, P-value = .675 (Fisher's Exact Test)

(not significant)

n=70

|               |            | Attitude of food handlers toward compliance with food safety measures |       | Total  |
|---------------|------------|---|-------|--------|
|               |            | Bad   | Good  |        |
| Gender Female | Count      | 1   | 10    | 11     |
|               | % of Total | 1.4%  | 14.3% | 15.7%  |
| Male          | Count      | 11  | 48    | 59     |
|               | % of Total | 15.7%   | 68.6% | 84.3%  |
| Total         | Count      | 12  | 58    | 70     |
|               | % of Total | 17.1%   | 82.9% | 100.0% |

**Table 5.28: Gender \* Practice of food handlers toward compliance with food safety measures**

Chi-square value = .351a, df = 2, P-value = .838  
(not significant)

n=70

|        |        | Practice of food handlers toward compliance with food safety measures |       |       | Total |        |
|--------|--------|---|-------|-------|-------|--------|
|        |        | Average   | Good  | Poor  |       |        |
| Gender | Female | Count   | 6     | 3     | 2     | 11     |
|        |        | % of Total  | 8.6%  | 4.3%  | 2.9%  | 15.7%  |
|        | Male   | Count   | 30    | 21    | 8     | 59     |
|        |        | % of Total  | 42.9% | 30.0% | 11.4% | 84.3%  |
| Total  |        | Count   | 36    | 24    | 10    | 70     |
|        |        | % of Total  | 51.4% | 34.3% | 14.3% | 100.0% |

**Table 5.29: Educational level \* Knowledge of food handlers toward compliance with food safety measures**

Chi-square value = 9.383a, df = 12, P-value = .670  
(not significant)

n=70

|                   |                        |                        | Knowledge of food handlers toward compliance with food safety measures |             |              | Total       |
|-------------------|------------------------|------------------------|--|-------------|--------------|-------------|
|                   |                        |                        | Average  | Good        | Poor         |             |
| Educational level | Illiterate             | Count<br>% of<br>Total | 0<br>0.0%  | 4<br>5.7%   | 1<br>1.4%    | 5<br>7.1%   |
|                   | Intermediary school    | Count<br>% of<br>Total | 1<br>1.4%  | 4<br>5.7%   | 0<br>0.0%    | 5<br>7.1%   |
|                   | Khalwa                 | Count<br>% of<br>Total | 1<br>1.4%  | 3<br>4.3%   | 1<br>1.4%    | 5<br>7.1%   |
|                   | Post graduate study    | Count<br>% of<br>Total | 0<br>0.0%  | 1<br>1.4%   | 0<br>0.0%    | 1<br>1.4%   |
|                   | Primary school         | Count<br>% of<br>Total | 3<br>4.3%  | 6<br>8.6%   | 0<br>0.0%    | 9<br>12.9%  |
|                   | Secondary school       | Count<br>% of<br>Total | 4<br>5.7%  | 14<br>20.0% | 3<br>4.3%    | 21<br>30.0% |
|                   | University             | Count<br>% of<br>Total | 7<br>10.0%   | 17<br>24.3% | 0<br>0.0%    | 24<br>34.3% |
| Total             | Count<br>% of<br>Total | 16<br>22.9%            | 49<br>70.0%  | 5<br>7.1%   | 70<br>100.0% |             |

**Educational level \* Attitude of food handlers toward compliance with food safety measures**

Chi-square value = 5.456a, df = 6, P-value = .487  
(not significant)

n=70

|                   |                     |                     | Attitude of food handlers toward compliance with food safety measures |             | Total        |
|-------------------|---------------------|---------------------|---|-------------|--------------|
|                   |                     |                     | Bad   | Good        |              |
| Educational level | Illiterate          | Count<br>% of Total | 1<br>1.4%   | 4<br>5.7%   | 5<br>7.1%    |
|                   | Intermediary school | Count<br>% of Total | 1<br>1.4%   | 4<br>5.7%   | 5<br>7.1%    |
|                   | Khalwa              | Count<br>% of Total | 1<br>1.4%   | 4<br>5.7%   | 5<br>7.1%    |
|                   | Post graduate study | Count<br>% of Total | 0<br>0.0%   | 1<br>1.4%   | 1<br>1.4%    |
|                   | Primary school      | Count<br>% of Total | 3<br>4.3%   | 6<br>8.6%   | 9<br>12.9%   |
|                   | Secondary school    | Count<br>% of Total | 5<br>7.1%   | 16<br>22.9% | 21<br>30.0%  |
|                   | University          | Count<br>% of Total | 1<br>1.4%   | 23<br>32.9% | 24<br>34.3%  |
|                   | Total               | Count<br>% of Total | 12<br>17.1%   | 58<br>82.9% | 70<br>100.0% |

**Educational level \* Practice of food handlers toward compliance with food safety measures**

Chi-square value = 16.439a, df = 12, P-value = .172  
n=70

|                   |                     |            | Practice of food handlers toward compliance of food safety measures |       |       | Total  |
|-------------------|---------------------|------------|---|-------|-------|--------|
|                   |                     |            | Average   | Good  | Poor  |        |
| Educational level | Illiterate          | Count      | 1   | 2     | 2     | 5      |
|                   |                     | % of Total | 1.4%  | 2.9%  | 2.9%  | 7.1%   |
|                   | Intermediary school | Count      | 4   | 0     | 1     | 5      |
|                   |                     | % of Total | 5.7%  | 0.0%  | 1.4%  | 7.1%   |
|                   | Khalwa              | Count      | 4   | 0     | 1     | 5      |
|                   |                     | % of Total | 5.7%  | 0.0%  | 1.4%  | 7.1%   |
|                   | Post graduate study | Count      | 0   | 1     | 0     | 1      |
|                   |                     | % of Total | 0.0%  | 1.4%  | 0.0%  | 1.4%   |
|                   | Primary school      | Count      | 6   | 1     | 2     | 9      |
|                   |                     | % of Total | 8.6%  | 1.4%  | 2.9%  | 12.9%  |
|                   | Secondary school    | Count      | 10  | 8     | 3     | 21     |
|                   |                     | % of Total | 14.3%   | 11.4% | 4.3%  | 30.0%  |
|                   | University          | Count      | 11  | 12    | 1     | 24     |
|                   |                     | % of Total | 15.7%   | 17.1% | 1.4%  | 34.3%  |
| Total             |                     | Count      | 36  | 24    | 10    | 70     |
|                   |                     | % of Total | 51.4%   | 34.3% | 14.3% | 100.0% |

**Table 5.31: Working years? \* Knowledge of food handlers toward compliance with food safety measures**

Chi-square value = 3.348a, df = 4, P-value = .501  
(not significant)

n=70

|                |                   |                        | Knowledge of food handlers toward compliance with food safety measures |             |           | Total        |
|----------------|-------------------|------------------------|--|-------------|-----------|--------------|
|                |                   |                        | Average  | Good        | Poor      |              |
| Working years? | 2 - 5 years       | Count<br>% of<br>Total | 4<br>5.7%  | 13<br>18.6% | 3<br>4.3% | 20<br>28.6%  |
|                | Less than 1 year  | Count<br>% of<br>Total | 7<br>10.0%   | 16<br>22.9% | 1<br>1.4% | 24<br>34.3%  |
|                | More than 5 years | Count<br>% of<br>Total | 5<br>7.1%  | 20<br>28.6% | 1<br>1.4% | 26<br>37.1%  |
| Total          |                   | Count<br>% of<br>Total | 16<br>22.9%  | 49<br>70.0% | 5<br>7.1% | 70<br>100.0% |

**Table 5.32: Working years? \* Attitude of food handlers toward compliance with food safety measures**

Chi-square value = 3.127<sup>a</sup>, df = 2, P-value = .209  
(not significant)

n=70

|                |                   |                        | Attitude of food handlers toward compliance with food safety measures |             | Total        |
|----------------|-------------------|------------------------|---|-------------|--------------|
|                |                   |                        | Bad   | Good        |              |
| Working years? | 2 - 5 years       | Count<br>% of<br>Total | 3<br>4.3%   | 17<br>24.3% | 20<br>28.6%  |
|                | Less than 1 year  | Count<br>% of<br>Total | 2<br>2.9%   | 22<br>31.4% | 24<br>34.3%  |
|                | More than 5 years | Count<br>% of<br>Total | 7<br>10.0%  | 19<br>27.1% | 26<br>37.1%  |
| Total          |                   | Count<br>% of<br>Total | 12<br>17.1%   | 58<br>82.9% | 70<br>100.0% |

**Table 5.33: Working years? \* Practice of food handlers toward compliance with food safety measures**  
**Chi-square value = 3.195a, df = 4, P-value = .526**  
**(not significant)**

n=70

|                |                   |                        | Practice of food handlers toward compliance with food safety measures |             |             | Total        |
|----------------|-------------------|------------------------|---|-------------|-------------|--------------|
|                |                   |                        | Average   | Good        | Poor        |              |
| Working years? | 2 - 5 years       | Count<br>% of<br>Total | 12<br>17.1%   | 5<br>7.1%   | 3<br>4.3%   | 20<br>28.6%  |
|                | Less than 1 year  | Count<br>% of<br>Total | 14<br>20.0%   | 7<br>10.0%  | 3<br>4.3%   | 24<br>34.3%  |
|                | More than 5 years | Count<br>% of<br>Total | 10<br>14.3%   | 12<br>17.1% | 4<br>5.7%   | 26<br>37.1%  |
| Total          |                   | Count<br>% of<br>Total | 36<br>51.4%   | 24<br>34.3% | 10<br>14.3% | 70<br>100.0% |

## Chapter 6: The Discussion

This study was done to assess, knowledge, attitude and practice of food handlers compliance with food safety measures in hey algamaa and hey alhuda restaurants, sharqalneel locality.

Most of the respondents (57.1%) were in the age group 20-30 years (Table 5.1), which is considered being young age. In other study had been done among food handlers in Ethiopia, it was found that the age between 18-57 years with an average (26.5%) another study in Saudi Arabia the respondents were males with (55.2%) aged between 26 and 35 years. The young age is promoting factors to trained FH about food safety measures.

A high percentage (84.3%) of ours respondents was males (figure 5.1), which similar to the study in Saudi Arabia where all the respondents were males also, in contrast to the study of Ethiopia, in which females were (87.6%), and there is another study done in Ghana show that (76.6%) were females. Cultural differences may affect gender of FH largely. In Sudan majority of the female are tea and coffee sellers.

Our study result show that (37.1%) of the FH has worked for more than 5 years duration (figure 5.2), and this duration was not similar to another study results done in Ethiopia, were most of them(61.8%) had worked for 2-3 years.

Most of our respondents (98.6%) wash their hands with water and soap after using toilet and only (1.4%) wash just with water (figure 5.7), this indicated that there was good behavior regard hand washing comparing with the study that had been done in Ethiopia which show that only (37.5%) of wash with water and soap.

In Our study (70%) of respondents have good knowledge about food safety measures (Table 5.20), where as in another study conducted in Malaysia it was about (90%).

Most of our respondents (82.9%) have a good attitude towards food safety measures (Table 5.21), which was similar to another study that was conducted in Malaysia (83.8%).

The respondents had average practice on food safety (51.4%) (Table 5.22), in contrast to the study of the Malaysia, in which the majority had good practice (92.9%).

The findings show that when knowledge about food safety among FH increased both of attitude and practice increased also.

In our study only (67%) of our FH have health card (Figure 5.3). Where in another study in Saudi Arabia almost all of them 97.9% have a health cards. so 52.9% of our respondents have no valid health card, this reflects non-compliance with food safety measures, and exposed a customer to get an illness.

Most (54%) of our respondents have no training courses about food safety measures (Figure 5.4), unlike the FH in another study Saudi Arabia, it was found that most of them had attended training courses related to food safety. more training course of FH about food safety measures strongly improve knowledge and practice of the FH.

## **Chapter 6: Conclusion & recommendation**

### **6.1. Conclusion:**

This study was conducted to assess compliance with FH with food safety measures in at SharqElneel Locality restaurants. The study concluded that:

- Most of food handlers with good and average knowledge and attitude towards food safety measures.
- (70%) had good knowledge about food safety measures.
- (88.9%) had good attitude
- (51.4%) with Average practice.
- 52.9% food handlers have no valid heath card.

## **6.2. Recommendation:**

The study recommended that:

- A regular training of FH about food safety measure, and continuous medical checkup, will improve their compliance with food safety measures
- Establish proper well-organized system by food and nutrient department for arrangement and supervision of the FH knowledge and attitude toward food safety measure.
- Supervision of food handlers and food places by expert well trained personals.
- Health inspectors should assure that FH must have a valid health card.

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**Annexes :**

Annex (1): Map of study area (Hey Algamaa, Hey Alhuda. SharqAlneel locality).

Annex (2): Questioner English version.

Annex (3): Questioner Arabic version.

Annex (4): Check list English version

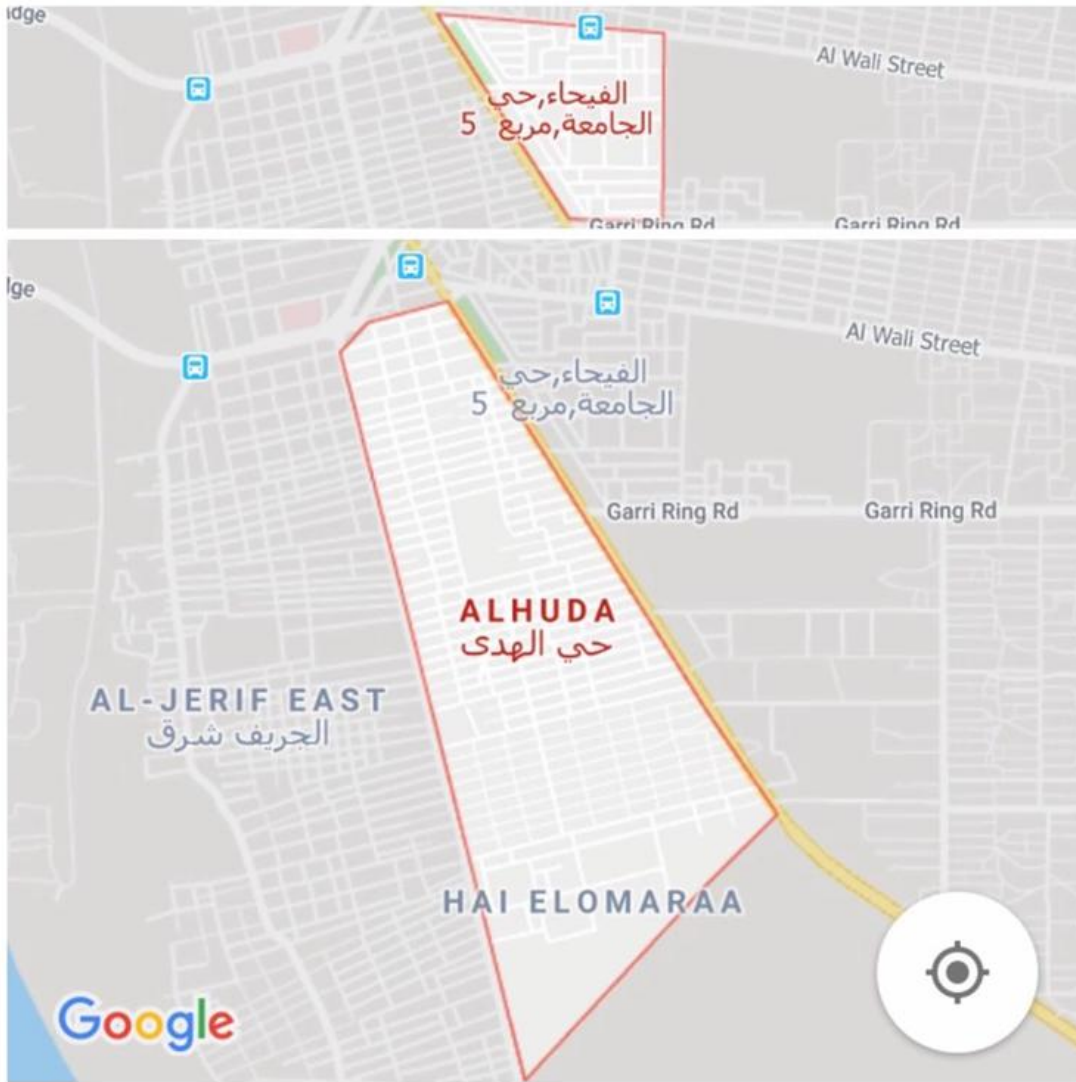
Annex (5): Check list Arabic version

Annex (6): Ethical consideration English version

Annex (7): Ethical consideration Arabic version

Annex (8): Approval from SharqAlneel locality

**Annex (1)**





**Annex (2)**

**Nile University**

**MBBS program**

**Questionnaire to know Knowledge, Attitude, And Practice of Food  
Handlers Toward Compliance with Food Safety Measures in Hey  
Algamaa and Hey Alhuda, Sharqalneel Locality December–November  
2019**

| Questions | Options |
|-----------|---------|
|-----------|---------|

| 1\age               |             |
|---------------------|-------------|
| Less than 20 years  | 20-30 years |
| 30-40 years         | 40-50 years |
| Older than 50 years |             |

| 2\Gender |        |
|----------|--------|
| Male     | Female |

| 3\Educational level |                     |
|---------------------|---------------------|
| Khalwa              | Illiterate          |
| Primary school      | Intermediary school |
| Secondary school    | University          |
| Post graduate study |                     |

| 4\Nationality |  |
|---------------|--|
| Sudanese      |  |
| Eritreans     |  |

|                   |           |
|-------------------|-----------|
| Syrians           |           |
| 5\ Working years? |           |
| Less than 1 year  | 2-5 years |
| More than 5 years |           |

6\ Do you have a health card?

|     |    |
|-----|----|
| Yes | No |
|-----|----|

7\ Have you trained about food safety measures before?

|     |    |
|-----|----|
| Yes | No |
|-----|----|

8\ Do you know the importance of hand washing?

|     |    |
|-----|----|
| Yes | No |
|-----|----|

9\ When you wash your hand?

|                             |                              |
|-----------------------------|------------------------------|
| Before start preparing food | After touching your nose     |
| After touching your hair    | After touching uncooked food |
| All the answer              |                              |

10\ Do you wash your hand after using the bathroom?

|     |    |
|-----|----|
| Yes | No |
|-----|----|

11\ If your answer is yes, you wash your hands with?

|       |                |
|-------|----------------|
| Water | Water and soap |
|-------|----------------|

12\ Do you wash fruits and vegetable s under running water?

|     |    |
|-----|----|
| Yes | No |
|-----|----|

13\ Do you store raw and cooked food separately?

|     |    |
|-----|----|
| Yes | No |
|-----|----|

14\ What you should do if you have a hand injury?

|                   |                  |
|-------------------|------------------|
| Continue the work | Notify your boss |
|-------------------|------------------|

15\ Do you have special work clothes?

|     |    |
|-----|----|
| Yes | No |
|-----|----|

16\ Do you complain of chronic sinuses?

|     |    |
|-----|----|
| Yes | No |
|-----|----|

17\What do you do if you have diarrhea, vomiting or sore throat?

|                                      |              |
|--------------------------------------|--------------|
| Notify my manger                     | Stop working |
| Take treatment and continue working? |              |

Annex (3)

جامعة النيل

برنامج الطب والجراحة

استبيان لمعرفة ، سلوك وممارسة عمال المطاعم بحي الجامعة وحي الهدي  
بمحلية شرق النيل وامثالهم لتدابير سلامة الأغذية نوفمبر 2019

| الخيارات        |         |                | السؤال              |
|-----------------|---------|----------------|---------------------|
| من 40 - 50 سنة  |         | أقل من 20 سنة  | 1/ العمر            |
| أكبر من 50 سنة  |         | من 20-30 سنة   |                     |
| _____           |         | من 30-40 سنة   |                     |
| أنثى            |         | ذكر            | 2/ النوع            |
| ثانوي           |         | أمي            | 3/ المستوى التعليمي |
| جامعي           |         | خلوة           |                     |
| فوق جامعي       |         | ابتدائي        |                     |
| _____           |         | متوسط          |                     |
| 3 سوري          | 2  حبشي | 1  سوداني      | 4/ الجنسية          |
| أكثر من 5 سنوات |         | أقل من سنة     | 5/ فترة العمل       |
| _____           |         | من 2 - 5 سنوات |                     |

|                                      |  |                                     |                                     |  |                             |
|--------------------------------------|--|-------------------------------------|-------------------------------------|--|-----------------------------|
|                                      | لا   |                                     | نعم                                 | 6/ هل لديك كرت صحي   |                             |
|                                      | لا   |                                     | نعم                                 | 7/ هل أخذت مسبقاً تدريب حول سلامة الأغذية؟                     |                             |
|                                      | لا <input type="radio"/>                         | نعم <input type="radio"/>           |                                     |  | 8 هل تعرف أهمية غسل اليدين؟ |
| كل ما ذكر <input type="radio"/>      | بعد لمس الطعام غير المطبوخ <input type="radio"/> | عقب لمس الشعر <input type="radio"/> | عقب لمس الأنف <input type="radio"/> | عند بداية إعداد الطعام <input type="radio"/>                   | 9 متى تغسل يديك؟            |
| لا <input type="radio"/>             | نعم <input type="radio"/>                        |                                     |                                     | 10 هل تغسل يديك عند الخروج من الحمام؟                          |                             |
| الماء والصابون <input type="radio"/> | الماء <input type="radio"/>                      |                                     |                                     | 11 إذا كانت إجابتك نعم بماذا؟                                  |                             |
| لا <input type="radio"/>             | نعم <input type="radio"/>                        |                                     |                                     | 12 هل تقوم بغسل الفواكه والخضروات تحت الماء الجاري؟            |                             |
| لا <input type="radio"/>             | نعم <input type="radio"/>                        |                                     |                                     | 13 هل تقوم بتخزين المواد الغذائية النيئة والمطبوخة بشكل منفصل؟ |                             |
| تواصل العمل <input type="radio"/>    | تخطر رئيسك <input type="radio"/>                 |                                     |                                     | 14 إذا أصبت بجرح في اليد، هل                                   |                             |
| لا <input type="radio"/>             | نعم <input type="radio"/>                        |                                     |                                     | 15 هل لديك ملابس خاصة بالعمل؟                                  |                             |
| لا <input type="radio"/>             | نعم <input type="radio"/>                        |                                     |                                     | 16 هل تشتكي من جيوب أنفية مزمنة؟                               |                             |

|                      |                                  |                      |   |    |
|----------------------|----------------------------------|----------------------|---|----|
| أخطر رئيسي<br>بالعمل | أتناول<br>علاج<br>وأواصل<br>عملي | أتوقف عن العمل فوراً | كيف تتصرف لو أصبت<br>بإسهال، استفراغ،<br>التهاب بالحلق؟ | 17 |
|----------------------|----------------------------------|----------------------|---|----|

**Annex (4)**

**Nile University**

**MBBS program**

**Checklist to know Knowledge, Attitude, And Practice of Food  
Handlers Toward Compliance with Food Safety Measures in Hey  
Algamaa and Hey Alhuda, Sharqalneel Locality December–November  
2019**

|   |             |              |
|---|-------------|--------------|
| 1\ Head cap?                              | Wearing     | Not wearing  |
| 2\ Nails                                  | Short       | Tall         |
| 3\ Wearing jewelry and rings?             | No          | Yes          |
| 4\ A wound in the hand?                   | No          | Yes          |
| 5\ The wound is covered?                  | Not covered | Well covered |
| 6\ Wearing gloves?                        | Not wearing | Wearing      |
| 7\ Wearing the work uniform?              | Not wearing | Wearing      |
| 8\ The work uniform is clean?             | Not clean   | Clean        |
| 9\ Wearing the work shoes?                | Not wearing | Wearing      |
| 10\ Cleanliness of the place?             | Not clean   | Clean        |
| 11\ The food is covered from the insects? | No          | Yes          |

|                           |                    |                        |               |
|---------------------------|--------------------|------------------------|---------------|
| 12\ Smoking?              | No                 |                        | Yes           |
| 13\ Snuffing?             | No                 |                        | Yes           |
| 14\ Water source?         | From network       |                        | Stored        |
| 15\ Hand washing basin?   | Available and used | Available but not used | Not available |
| 17\ Cleaning tools using? | Water              |                        | Water & soap  |
| 18\ Health card is valid? | No                 |                        | Yes           |

Annex (5)

جامعة النيل

برنامج الطب والجراحة

قائمة ملاحظة لمعرفة ، سلوك وممارسة عمال المطاعم بحي الجامعة وحي الهدي  
بمحلية شرق النيل وامتثالهم لتدابير سلامة الأغذية نوفمبر 2019

|                                 |                                 |                           |    |
|---------------------------------|---------------------------------|---------------------------|----|
| غير مرتدي <input type="radio"/> | مرتدي <input type="radio"/>     | طاقية الرأس               | 1  |
| قصرية <input type="radio"/>     | طويلة <input type="radio"/>     | الأظافر                   | 2  |
| لا يضع <input type="radio"/>    | يضع <input type="radio"/>       | لبس الخلي والخاتم         | 3  |
| لا يوجد <input type="radio"/>   | يوجد <input type="radio"/>      | وجود جرح في أيدي          | 4  |
| غير مغطى <input type="radio"/>  | مغطى جيدا <input type="radio"/> | هل الجرح مغطى؟            |    |
| غير مرتدي <input type="radio"/> | مرتدي <input type="radio"/>     | القفازات                  | 5  |
| غير مرتدي <input type="radio"/> | مرتدي <input type="radio"/>     | مرتدي زي العمل            | 6  |
| لا <input type="radio"/>        | نعم <input type="radio"/>       | زي العمل نظيف             | 7  |
| غير مرتدي <input type="radio"/> | مرتدي <input type="radio"/>     | منتعل حذاء العمل          | 8  |
| غير نظيف <input type="radio"/>  | نظيف <input type="radio"/>      | نظافة المكان              | 9  |
| لا <input type="radio"/>        | نعم <input type="radio"/>       | هل الغذاء مغطى من الحشرات | 10 |
| يسف <input type="radio"/>       | يسجر <input type="radio"/>      | ممارسة عادات ضارة أثناء   | 11 |

|                                 |   |                           |    |
|---------------------------------|---|---------------------------|----|
| لا يسف <input type="radio"/>    | لا يسجر <input type="radio"/>           | العمل                     |    |
| تخزين <input type="radio"/>     | شبكة <input type="radio"/>              | مصدر المياه               | 12 |
| غير متوفر <input type="radio"/> | متوفر وغير مستخدم <input type="radio"/> | حوض لغسيل الأيدي          | 13 |
| الماء فقط <input type="radio"/> | الماء والصابون <input type="radio"/>    | نظافة العدة باستخدام      | 14 |
| لا <input type="radio"/>        | نعم <input type="radio"/>               | الكرت الصحي ساري المفعول؟ | 15 |

### Annex (6)

### Ethical consideration

We are the students of the Nile Medical College. Fourth-year medical and surgery program we are looking for Knowledge, Attitude and Practice of Food Handlers toward Compliance with Food Safety Measures in Hey Algamaa and Hey Alhuda Restaurants, SharqElneel Locality December 2018–November 2019.

Access to sufficient amounts of safe and nutritious food is key to sustaining life and promoting good health.

Unsafe food containing harmful bacteria, viruses, parasites or chemical substances, causes more than 200 diseases ranging from diarrhea to cancers.

This study intended to assess the knowledge, attitude and practice of food handlers toward compliance with food safety measures in Hay Algamaa and Hey alhuda Restaurants, ShareqElneel Locality, December 2018–November 2019..

You have been selected to participate in this research and another participant randomly and the number of them about 80 volunteers.

We expect you and other participants to get useful results and use them to increase the awareness of the food handlers and encourage them to use food safety measures to its benefit and it is important in reducing illness.

In this study, we will collect the information in two ways. First, take information from you without personal information or information about you or your restaurant. Second, the researcher will take notes from the place where food is prepared, juices and preparing meals.

In addition, we assure you that your participation with us in this research does not lead to any kind of damage and risk as much as it is useful for you and the whole community

We assure you of the confidentiality of your information and documents, and that only the researcher and the research ethics committee will see them.

We would also like to point out that participation in the research is voluntary and your refusal to

Participate in the research does not lose your rights to any benefit from the research.

We also assure you that you can retreat from this research at any time, without explaining the reasons. This done by signing.

If you have any questions or inquiry about the research, the participants with you in the research, or your rights as a participant during the research, you can contact 0900407916.

Signature: .....

**Annex (7)**

الموافقة المستنيرة

نحن طلاب كلية النيل الطبية (إسراء الصافي مصطفى، ريان الجندي محمد، مريم خلف الزبير، هبة قسم الله محمد) السنة الرابعة برنامج الطب والجراحة نقوم ببحث عن معرفة، سلوك وممارسة عمال المطاعم بحي الجامعة وحي الهدي بحلية شرق النيل وامتثالهم لتدابير سلامة الأغذية نوفمبر 2019.

إن الحصول على كميات كافية من الأغذية المأمونة والمغذية أمر أساسي للحفاظ على الحياة وتعزيز الصحة الجيدة. يتسبب الغذاء غير الآمن الذي يحتوي على بكتيريا أو فيروسات أو طفيليات أو مواد كيميائية ضارة بأكثر من 200 مرض -يتراوح من الإسهال إلى السرطان.

نريد اجراء هذه الدراسة لتقييم معرفة، سلوك وممارسات العاملين في مجال الأغذية تجاه الامتثال لتدابير سلامة الأغذية في مطاعم حي الجامعة وحي الهدي، محلية شرق النيل. بحلول ديسمبر 2018 -نوفمبر 2019

لقد تم اختيارك لتشارك في هذا البحث أنت ومعك عدد آخر من المشاركين عشوائيا.

نتوقع بمشاركتك أنت والمشاركين الآخرين أن نتحصل على نتائج تفيدنا في أن نوعي معدي الطعام ونشجعهم على استخدام تدابير سلامة الغذاء لمصلحته ومهمته في الحد من الأمراض.

خلال هذه الدراسة سنقوم بجمع المعلومات بطريقتين، الأولى: بأخذ معلومات منكم دون معلومات شخصية أو معلومات تخصكم أو تخص محللكم، الثانية: يقوم الباحث بأخذ ملاحظات من مكان إعداد الطعام، العوائير وإعداد الوجبات .

ونؤكد لك أن مشاركتك معنا في هذا البحث لا يحمل لك أي نوع من أنواع الأضرار والمخاطر بقدر ما هو مفيد لك وللمجتمع كافة

ونحن إذ نأمل في مشاركتك معنا في هذا البحث، نؤكد لك على سرية المعلومات والوثائق الخاصة بك، وأنه لن يطلع عليها إلا الباحث المعنى ولجنة أخلاقيات البحوث.

ونود أن نشير كذلك إلى أن المشاركة في البحث طوعية وأن رفضك للمشاركة في البحث لا تفقدك الحق في أي فوائد من البحث.

وأنه بمشاركتك ستكون أحد المتطوعين والذين يشملهم البحث وعددهم حوالي 70 مشارك متطوع.

كما نؤكد لك إمكانية الانسحاب من البحث في أي وقت تشاء، ودون إبداء توضيح لأسباب الانسحاب، ويتم ذلك بالتوقيع على طلب الانسحاب، ولن يؤثر ذلك أيضاً على حقك في الاستفادة من البحث.

إذا كان لديك أي سؤال أو استفسار يخص البحث، المشاركين معك في البحث، أو حقوقك كمشارك أثناء تنفيذ البحث يمكنك الاتصال على 0900407916.

.....التوقيع

**Annex (8)**

**Approval from SharqAlneel locality**

1 مايو 2018

السيد الموقر مدير / رئيس جامعة النيل...  
السلام عليكم ورحمة الله تعالى وبركاته .

## الموضوع: البحث المصغر لطلاب السنة الرابعة طب/ كلية النيل للعلوم الطبية

بالإشارة للموضوع أعلاه . أفيد سيادتكم بأن طلابنا بالسنة الرابعة طب يقومون بإجراء بحوث مصغرة الهدف الأساسي منها تطبيق طرق البحث العلمى والى تتم تحت إشراف أساتذة مؤهلين لذلك .  
يسرنا أن مؤسساتكم العامرة من الجهات التى طالما تميزت بتقديم كل العون والمؤازرة للطلاب فى هذا المجال ، ونطمح أن يمتد تعاونكم معنا فى الموافقة المبذوبة لطلابنا وتسهيل مهمتهم لإجراء البحث المصغر وذلك بتوفير بعض المعلومات الأولية بها يكتمل مقترح البحث بينما يتم جمع المعلومات فى الفترة ما بين ديسمبر 2018 ومارس 2019 .  
شاكرين لكم حسن تعاونكم .

والله ولى التوفيق ..



أ. سيد محمد السيد  
محل كى للمهمة  
رئيس اللجنة  
د. محمد السيد  
مدير إدارة  
مدير إدارة  
مدير إدارة



لا مانع لنا من علمي الصوع  
بمكتبه القعد عند بداية عملهم  
اتمنا الطيب  
م. محمد ودره القوي