

# Awareness of Restaurant Hygiene Practices Among a Sample of Libyan Consumers

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## **Abstract:**

The restaurant's hygiene is a critical aspect, which, if not taken care of, may affect the prevalence of foodborne diseases. The study was designed to identify the awareness of restaurant hygiene among a random sample of Libyan consumers through an electronic questionnaire. The questionnaire included 46 questions. The survey was conducted between May and August of the year 2021. SPSS was used to analyze the data. The results showed that the participants agreed and strongly agreed that the cleanliness of the restaurant was important to them in general (98%). Half the participants tend not to complain if they notice the restaurant is dirty. Food freshness and food temperature were considered by 80% and 64% of participants important, very important, or extremely important, among other questions about the food presented in the restaurant, respectively. About 80% of the sample considered that the publication of the examination results of the restaurant by the competent authorities was important, very important, or extremely important. Almost half of the sample (49.7%) said that no hot water in restaurant restrooms is important, very important, or extremely important. Only 31% of the sample mentioned that the accessories, like earrings, of the wait staff are important, very important, or extremely important. The cleanliness and taste of food are considered by 49% and 48%, respectively, to be the most important aspects when evaluating restaurant quality. Based on the results, there is a need for awareness programs to improve the knowledge of consumers about restaurant hygiene practices.

**Keywords:** Hygiene practices, Restaurant, Food safety, Consumer, Cleanliness.

## الوعي بالممارسات الصحية في المطاعم لدى عينة من المستهلكين الليبيين

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### الملخص:

تعد الممارسات الصحية في المطاعم جانباً بالغ الأهمية، والتي إذا لم يتم الاعتناء بها، قد تؤثر على انتشار الأمراض المنقولة بالغذاء. صممت الدراسة للتعرف على الوعي بالممارسات الصحية في المطاعم لدى عينة عشوائية من المستهلكين الليبيين من خلال استبيان إلكتروني. وتضمن الاستبيان 46 سؤالاً. تم إجراء المسح في الفترة ما بين شهري مايو وأغسطس من عام 2021. وتم استخدام برنامج الحزمة الإحصائية للعلوم الاجتماعية لتحليل البيانات. وأظهرت النتائج أن المشاركين موافقون وموافقون بشدة على أن نظافة المطعم مهمة بالنسبة لهم بشكل عام (98%). يميل نصف المشاركين إلى عدم الشكوى إذا لاحظوا أن المطعم غير نظيف. اعتبر 80% و 64% من المشاركين أن الغذاء الطازج ودرجة حرارته مهمان أو مهمان جداً أو مهمان للغاية، من بين أسئلة أخرى حول الطعام المقدم في المطعم، على التوالي. واعتبر حوالي 80% من أفراد العينة أن نشر نتائج فحص المطعم من قبل الجهات المختصة أمر مهم أو مهم جداً أو مهم للغاية. وقال ما يقرب من نصف العينة (49.7%) أن عدم وجود الماء الساخن في دورات المياه في المطاعم أمر مهم، مهم جداً، أو مهم للغاية. ذكر 31% فقط من العينة أن الإكسسوار، مثل الأقراط، الخاصة بالنادل مهمة، أو مهمة جداً، أو مهمة للغاية. وتعتبر نظافة وطعم الغذاء بنسبة 49% و 48% على التوالي من أهم الجوانب عند تقييم جودة المطعم من قبل المستهلكين. وبناءً على النتائج، هناك حاجة لبرامج توعية لتحسين معرفة المستهلكين حول الممارسات الصحية بالمطاعم.

**الكلمات المفتاحية:** الممارسات الصحية، المطعم، سلامة الغذاء، المستهلك، النظافة.

### 1. Introduction:

Food safety and hygiene practices are crucial in all food establishments, including restaurants, because they relate to human health, community development, and the economy (Abuhlega et al., 2020). There is an increasing

tendency to eat outside in restaurants and other public places, which leads to a change in dietary patterns and an increase in household spending on food (Kolanowski et al., 2021). Eating-out establishments are playing an increasing role in the incidence of foodborne diseases (FBDs) (Henson et al., 2006). Most foodborne disease outbreaks occur at home, restaurants, and/or social events (Stratev et al., 2017). FBDs pose a serious threat to the health of millions of people (WHO, 2002). The causes of incidents of FBDs are not following good health practices, poor hygiene practices of food handlers, the failure to reach the proper cooking temperature that prevents the growth of pathogens, not storing food properly, especially related to storage temperature, cross-contamination, and raw materials from not reliable and accredited sources (WHO, 2006).

As mentioned in the international standard of the Codex Alimentarius Commission for general principles of food hygiene: food business operators should be aware of and understand the hazards associated with the food they produce, transport, store, and sell, and the measures required to control those hazards relevant to their business so that food reaching consumers is safe and suitable for use (FAO & WHO, 2023). Poor hygiene in food establishments such as restaurants contributes to the prevalence of foodborne diseases due to the growth of pathogens, such as *Salmonella enteritidis*, which was discovered on hand towels, and *Staphylococcus aureus* and *Escherichia coli* O157:H7 in the equipment (Läikkö-Roto & Nevas, 2014). Several studies have shown that cleanliness is the most important factor for consumers when choosing a restaurant (Worsfold, 2006; Aksoydan, 2007; Fatimah et al., 2011). Leach et al. (2001) reported that some factors focused on by consumers as the most important factor in providing food are flies being kept away from food, personal hygiene practices, and the food temperature. In addition, satisfaction with eating out in public places between individuals depends on their attitude and knowledge of some factors such as satiety, sensory experience, food quality, nutritional value, food origin, health, appearance, freshness, price, promotion, responsible company, diversity, and renewal (Trafialek et al., 2019).

In recent decades, the lifestyles of Libyan families have changed, including eating food in restaurants. Although many cases of poisoning have occurred in different cities in Libya in recent years, consumers still eat at restaurants (Abuhlega, 2023). Due to the development of life and being outside the home for long periods for various reasons, the time available to prepare meals at home has decreased; thus, ready-made meals, whether eating out in a restaurant or delivered food, have become the alternative. Therefore, this may result in the consumption of food from unknown sources and increase the chance of contamination with pathogens and the occurrence of disease (Gargiulo et al., 2022). Food poisoning incidents occur frequently in Libya due to eating food in

restaurants, making it important to measure consumer food awareness about various aspects, in particular the hygiene practices of restaurants. Further, incidents of food poisoning because of eating in restaurants are a global problem (Yasami et al., 2022). For example, around half of reported foodborne illness outbreaks in the United States occur in restaurants (Centers for Disease Control and Prevention, 2013). Hygiene is a main factor that consumers should pay attention to when dining out (Uysal & Lekesiz, 2022). Consumers' awareness of food hygiene will lead to a better hygienic food service business (Thio & Wijaya, 2010). Several local studies concluded the need to raise awareness of food safety among consumers in Libya (Abuhlega, 2020; Abuhlega et al., 2020). In addition, almost no previous local studies in Libya aimed to assess consumers' knowledge of the important elements for evaluating restaurant hygiene. Therefore, the study aimed to evaluate the level of knowledge of a sample of Libyan consumers about hygiene in restaurants, determine which elements consumers consider important when evaluating restaurant hygiene, and determine and analyze whether a random sample of consumers different in gender, age, marital status, type of employment, monthly income, and educational level have different views on restaurant hygiene. As well as providing recommendations related to the extent to which consumers in Libya know the importance of hygiene in restaurants.

## **2. Materials and Methods:**

### **2.1 Questionnaire design and data collection:**

The study randomly targeted 507 individuals in Libya. The survey was conducted using an electronic questionnaire designed by researchers between May and August 2021. The time to fill out the questionnaire was approximately 20 minutes. The participants to this study were fully informed about the nature of the study and voluntarily consented to filling out the questionnaire. No identities were documented on the questionnaires, and all the participants' personal information was kept confidential. The questions in this survey were based on a previous study carried out by Yoo (2012). The questionnaire consisted of three parts: part 1: demographic characteristics of participants (8 questions), part 2: general perceptions of restaurant cleanliness (8 questions), and part 3: hygienic elements of the restaurant (30 questions).

### **2.2 Validity and Reliability of the Questionnaire:**

Three professors in the field of food science and technology verified the validity and confidence of the questions of the questionnaire, and almost all the proposed notes were involved. Also, 30 preliminary questionnaires were distributed to a random sample of individuals to determine the validity and reliability of the questionnaire. Their responses were not included in the final

data for this study, and some questions were modified to facilitate their understanding. Furthermore, the questions were linguistically simplified to be clearer. Cronbach's ALPHA test was conducted, and the result was 99.8.

### **2.3 Data Analysis:**

The SPSS (Statistical Package for Social Sciences), version 22 was used to code and analyze the data. For summarizing demographic characteristics, general perceptions of restaurant cleanliness, and hygienic elements of the restaurant, descriptive statistics (mean, standard deviation, and frequencies) were used. A five-point Likert scale with 1= strongly disagree, 2= not agree, 3= neutral, 4= agree, and 5= strongly agree was used for the questions on the general perceptions of the participants about the restaurant's cleanliness. Also, a five-point Likert scale was used for the questions of elements of cleanliness of the restaurant (food, environment, restroom, and wait staff) where 5= extremely important, 4= very important, 3= important, 2 = somewhat important, and 1= not at all important. The chi-square test ( $\chi^2$ ) was applied to determine the relationship between the dependent and independent variables. A p-value < 0.05 was considered statistically significant.

### **3. Results:**

Demographics. Table (1) summarizes participant demographic information. There were a total of 507 participants in the study, including 61.5% females and 38.5% males. The highest percentage of participants, 89.7% and 82.6%, were < 35 years old and single, respectively. About 49% of participants did not work. The family's monthly income for the majority of participants (63.1%) was <1000 Libyan dinars. More than two-thirds of participants (76.3%) received a university education, and 6.3% received M.Sc. and Ph.D. Only 5% of participants had restaurant work experience (Figure 1).

**Table (1): Demographic characteristics of the study sample (n= 507)**

Variable	Number	Percentage (%)
<b>Gender</b>		
Female	312	61.5
Male	195	38.5
<b>Age</b>		
< 35	455	89.7
> 35	52	10.3
<b>Marital Status</b>		
Single	419	82.6
Married	88	17.4
<b>Type of Employment</b>		
Public employee	117	23.1
Private employee	142	28
Retired	2	0.4
Does not work	246	48.5
<b>*Family's Monthly Income</b>		
<1000	320	63.1
1000-3000	162	32
>3000	25	4.9
<b>Consumer's Education Level</b>		
Less than university	88	17.4
University education	387	76.3
M.Sc. and Ph.D.	32	6.3

\* Libyan Dinar

Eating-out Behavior. The frequency of dining out at a restaurant among participants during the past six months is illustrated in Figure (2). A high percentage of the sample (42%) reported that they dined out 1 to 6 times in the last 6 months. The participants who reported that they dined out 6 to 24 times, 24 to 48 times, three times per week, and every day represent 19, 13, 8, and 3% of the sample, respectively. The statistical findings revealed that the gender ( $p= 0.010$ ), family's monthly income ( $p= 0.000$ ), and marital status ( $p= 0.028$ ) of participants influenced the frequency of dining out at a restaurant. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). Participants' spending when dining out at a restaurant is shown in Figure (3). A high percentage of the sample (34%) mentioned that they spent  $\leq 25$  Libyan dinars, while a low percentage of them (4%) reported that they spent  $> 200$  Libyan dinars. Also, the statistical findings revealed that gender ( $p= 0.000$ ), age ( $p= 0.000$ ), marital status ( $p= 0.023$ ), type of employment ( $p= 0.012$ ), family's

monthly income ( $p= 0.004$ ), and consumer's education level ( $p= 0.000$ ) influenced participants' spending when dining out at a restaurant.

Table (2) shows the general perceptions of the participants about the restaurant's cleanliness. A high percentage of the participants (98%) agreed or strongly agreed that the cleanliness of the restaurant was important to them. The statistical results showed an influence of age ( $p= 0.032$ ) and type of employment ( $p= 0.000$ ) on the importance of the cleanliness of the restaurant to participants. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). Also, a high percentage of participants (96%) agreed or strongly agreed that restaurant cleanliness is important to them when evaluating overall restaurant quality. Also, the statistical results showed an influence of the type of employment ( $p= 0.009$ ) on the importance of restaurant cleanliness when evaluating overall restaurant quality. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). About 92% of the sample agreed or strongly agreed that the cleanliness of the restaurant is important to them when deciding whether to go back to the restaurant or not. The statistical results revealed the influence of marital status ( $p= 0.031$ ), type of employment ( $p= 0.001$ ), and the family's monthly income ( $p= 0.007$ ), on the importance of the cleanliness of the restaurant when deciding whether to go back to the restaurant or not. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). Participants' responses regarding the cost of a restaurant and expectations of restaurant cleanliness varied, with almost 51% agreeing or strongly agreeing that they expect a high level of cleanliness in high-budget restaurants. The statistical results showed an influence of consumer's education level ( $p= 0.024$ ) on expecting a high level of cleanliness in high-budget restaurants. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). A low percentage of the sample (15.0%) agreed or strongly agreed that they expect low standards in low-budget restaurants. The statistical results showed no influence of the demographic characteristics considered in this study on the previous question. A high percentage of the sample (96%) agreed or strongly agreed that a clean restaurant would increase their overall satisfaction level. The statistical results showed an influence of the type of employment ( $p= 0.001$ ) on the importance of a clean restaurant in increasing participants' overall satisfaction level. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). Approximately 96% of participants agreed or strongly agreed that a dirty restaurant would reduce their overall satisfaction level. The statistical results revealed the influence of type of employment ( $p= 0.003$ ) on the response to the previous question. While no influence was found for other characteristics

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considered in this study ( $p > 0.05$ ). Only 50% of participants agreed or strongly agreed that they tend to complain to the restaurant staff if they notice that the restaurant is dirty. The statistical results showed no influence of the demographic characteristics considered in this study on the response to the previous question.

**Table (2): General perceptions of the participants about the restaurant cleanliness (n = 507)**

Question	Strongly disagree	Not agree	Neutral	Agree	Strongly agree	M±SD
The cleanliness of the restaurant is important to me	4 (0.8)	0 (0.0)	7 (1.4)	70 (13.8)	426 (84.0)	4.8±0.53
Restaurant cleanliness is important to me when evaluating overall restaurant quality	4 (0.8)	7 (1.3)	9 (1.8)	155 (30.6)	332 (65.5)	4.6 ± 0.68
The cleanliness of the restaurant is important to me when deciding whether to go back to the restaurant or not	9 (1.8)	19 (3.7)	15 (3.0)	123 (24.3)	341 (67.2)	4.5±0.86
I expect a high level of cleanliness in high-budget restaurants	21 (4.1)	115 (22.7)	113 (22.3)	121 (23.9)	137 (27.0)	3.5 ±1.20
I expect low standards in low-budget restaurants	68 (13.4)	239 (47.1)	123 (24.3)	62 (12.2)	15 (3.0)	2.4±0.97
A clean restaurant will increase my overall satisfaction level	5 (1.0)	6 (1.2)	11 (2.1)	196 (38.7)	289 (57.0)	4.5±0.69
A dirty restaurant will reduce my overall satisfaction level	4 (0.8)	4 (0.8)	13 (2.5)	147 (29.0)	339 (66.9)	4.6±0.66
I tend to complain to the restaurant staff if I notice that the restaurant is dirty	12 (2.4)	93 (18.3)	148 (29.2)	168 (33.1)	86 (17.0)	3.4±1.0

The percipients' perception about elements of cleanliness of the restaurant. The elements included food, environment, restroom, and wait staff. Table (3) shows the results of the perceptions of the participants about elements of the restaurant food. About 80% of the sample reported that food freshness is very



important or extremely important. The statistical results showed no influence of the demographic characteristics considered in this study on the response to the previous question. Approximately half of the participants considered how to serve food to be very important or extremely important. The statistical results showed an influence of gender ( $p= 0.037$ ), and marital status ( $p= 0.003$ ) on the importance of how to serve food. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). Of the participants, about 64% indicated that food temperature is very important or extremely important. The statistical results showed an influence of consumer's education level ( $p= 0.039$ ) on the importance of food temperature. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). More than half of the sample (63.5%) mentioned that food contact surfaces (such as plates and glassware) are very important or extremely important. The statistical results showed no influence of the demographic characteristics considered in this study on the response to the previous question. Over fifty-seven percent (57.4%) reported that unprotected food (for example, seasoning exposed on the table) is very and extremely important. The statistical results revealed the influence of gender ( $p= 0.000$ ), age ( $p= 0.028$ ), and type of employment ( $p= 0.032$ ) on the importance of protection of food. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ).

**Table (3): Perceptions of the participants about food presented in the restaurant (n = 507)**

Question	Not at all important	Somewhat important	Important	Very important	Extremely important	M±SD
Food freshness	3 (0.6)	28 (5.5)	72 (14.2)	180 (35.5)	224 (44.2)	4.2±0.91
How to serve food	13 (2.6)	115 (22.7)	128 (25.2)	140 (27.6)	111 (21.9)	3.4±1.13
Food temperature	4 (0.8)	63 (12.4)	116 (22.9)	179 (35.3)	145 (28.6)	3.8±1.02
Food contact surfaces (such as plates and glassware)	18 (3.6)	62 (12.2)	105 (20.7)	130 (25.6)	192 (37.9)	3.8±1.17
Unprotected food (for example, seasoning exposed on the table)	41 (8.1)	93 (18.3)	82 (16.2)	123 (24.3)	168 (33.1)	3.6 ±1.32

Table (4) displays the results of participants' perceptions of elements of the restaurant environment. More than half of the sample (61%) mentioned that the

environment around the restaurant is important, very important, or extremely important. The statistical results show an influence of the family's monthly income on the importance of the environment around the restaurant ( $p=0.013$ ). While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). Approximately 71% of participants reported that restaurant floors and carpets are important, very important, or extremely important. Also, the statistical results show an influence of age ( $p= 0.007$ ), and marital status ( $p= 0.042$ ) on the importance of restaurant floors and carpets. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). About 63% of participants considered that windows and window sills are important, very important, or extremely important. The statistical results showed an influence of age ( $p= 0.042$ ), and type of employment ( $p= 0.016$ ) on the importance of windows and window sills. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). Three-quarters of the sample (75%) said that tablecloths are important, very important, or extremely important. The statistical results showed an influence of the age of participants ( $p= 0.038$ ) on the importance of tablecloths. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). About half of the sample (52%) mentioned that an open kitchen is important, very important, or extremely important. The statistical results showed no influence of the demographic characteristics considered in this study on the response to the previous question ( $p> 0.05$ ). A high percentage of participants (94%) confirmed that the presence or evidence of insects in the restaurant is important, very important, or extremely important. The statistical results showed an influence of gender ( $p= 0.037$ ), and type of employment ( $p= 0.010$ ) on the importance of the presence or evidence of insects in the restaurant. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). The majority of the sample (72%) reported that humidity is important, very important, or extremely important. The statistical results showed an influence of age ( $p= 0.022$ ) on the importance of humidity. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). A high percentage of participants (80%) confirmed that the publishing of results of the examination of the competent authorities of the restaurant is important, very important, or extremely important. The statistical results showed an influence of marital status ( $p= 0.013$ ) on the importance of publishing the examination results of the restaurant by the competent authorities. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ).

**Table (4): Perceptions of the participants about restaurant environment (n = 507)**

Question	Not at all important	Somewhat important	Important	Very important	Extremely important	M±SD
The environment around the restaurant.	48 (9.5)	151 (29.7)	90 (17.8)	116 (22.9)	102 (20.1)	3.1±1.30
Restaurant floors and carpets.	39 (7.7)	109 (21.5)	115 (22.7)	127 (25.0)	117 (23.1)	3.3±1.30
Windows and window sills.	61 (12.0)	127 (25.1)	129 (25.4)	107 (21.1)	83 (16.4)	3.0±1.30
Tablecloths	38 (7.5)	87 (17.2)	107 (21.1)	109 (21.5)	166 (32.7)	3.5±1.30
Open kitchen.	107 (21.1)	138 (27.2)	102 (20.1)	80 (15.8)	80 (15.8)	2.8 ±1.4
Presence or evidence of insects in the restaurant.	13 (2.6)	18 (3.5)	45 (8.9)	98 (19.3)	333 (65.7)	4.4±0.97
Humidity	43 (8.5)	101 (19.9)	91 (17.9)	112 (22.1)	160 (31.6)	3.5 ±1.3
The examination results of the restaurant by competent authorities have been published	24 (4.7)	77 (15.2)	109 (21.5)	125 (24.7)	172 (33.9)	3.7 ±1.2

Table (5) shows the results of participants' perceptions of elements of restaurant restrooms. A high percentage of participants (93%) confirmed that restroom floors are important, very important, or extremely important. The statistical results showed no influence of the demographic characteristics considered in this study on the response of the previous question ( $p > 0.05$ ). Also, a high percentage of the sample (98%) considered that restroom odor is important, very important, or extremely important. The statistical results showed an influence of age ( $p=0.014$ ), type of employment ( $p=0.004$ ), and consumer's education level ( $p=0.001$ ) on the importance of odor. While no influence was found for other characteristics considered in this study ( $p > 0.05$ ). Also, 95% of participants mentioned that trash in toilets is important, very important, or extremely important. The statistical results revealed the influence of a family's monthly income on the importance of trash in toilets ( $p= 0.011$ ).

While no influence was found for other characteristics considered in this study ( $p > 0.05$ ). Also, about 94% of the sample reported that no soap in the restroom is important, very important, or extremely important. The statistical results showed an influence of the type of employment ( $p = 0.035$ ) on the importance of no soap in the restroom. While no influence was found for other characteristics considered in this study ( $p > 0.05$ ). Almost half of the sample said that no hot water is important, very important, or extremely important. The statistical results showed no influence of the demographic characteristics considered in this study on the previous question ( $p > 0.05$ ). About seventy-six of the participants mentioned that no paper towels or drying device is important, very important, or extremely important. The statistical results showed no influence of the demographic characteristics considered in this study on the response of the previous question. More than half of the sample (66%) reported that employee hand washing signage is important, very important, or extremely important. The statistical results showed no influence of the demographic characteristics considered in this study on the response of the previous question ( $p > 0.05$ ).

**Table (5): Perceptions of the participants about restaurant restrooms (n = 507)**

Question	Not at all important	Somewhat important	Important	Very important	Extremely important	M±SD
Floors	11 (2.2)	27 (5.3)	72 (14.2)	144 (28.4)	253 (49.9)	4.2 ±1.0
Odor	4 (0.8)	8 (1.6)	28 (5.5)	106 (20.9)	361 (71.2)	4.6±0.73
Trash in toilets	12 (2.4)	16 (3.1)	48 (9.5)	87 (17.1)	344 (67.9)	4.4±0.95
No soap	9 (1.8)	20 (3.9)	46 (9.0)	89 (17.6)	343 (67.7)	4.5±0.93
No hot water	111 (21.9)	144 (28.4)	83 (16.4)	43 (8.5)	126 (24.8)	2.9 ±1.5
No paper towels or drying device	42 (8.3)	80 (15.8)	94 (18.5)	97 (19.1)	194 (38.3)	3.6±1.3
Employee hand washing signage.	67 (13.2)	104 (20.5)	109 (21.5)	87 (17.2)	140 (27.6)	3.3 ±1.4

Table (6) reports the results of participants' perceptions of elements of wait staff among a sample of consumers. About half of the sample (55%) mentioned that the waiter's hairstyle (for example, the hair was pulled back, the hair net was used) is important, very important, or extremely important. The statistical results showed no influence of the demographic characteristics considered in

this study on the response of the previous question. Almost fifty-seven of the participants said that having a uniform is important, very important, or extremely important. The statistical results showed no influence of the demographic characteristics considered in this study on the response to the previous question. A high percentage of the sample (95%) confirmed that the hands and nails are important, very important, or extremely important. The statistical results showed no influence of the demographic characteristics considered in this study on the response to the previous question. A low percentage of the participants reported that accessories like earrings are important, very important, or extremely important. The statistical results showed no influence of the demographic characteristics considered in this study on the response to the previous question. A high percentage of the sample (93%) considered that hand contact with food without gloves is important, very important, or extremely important. The statistical results showed an influence of consumer's education level ( $p=0.018$ ) on importance of hand contact with food without gloves. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). Also, a high percentage of the sample (95%) confirmed that coughing and sneezing are important, very important, or extremely important. The statistical results showed no influence of the demographic characteristics considered in this study on the response to the previous question. Approximately eighty-six percent of participants mentioned that smoking is important, very important, or extremely important. The statistical results showed an influence of gender ( $p= 0.037$ ) of participants on the importance of smoking. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). Less than half of the sample (47%) said that eating and drinking while working are important, very important, or extremely important. The statistical results show an influence of type of employment on the importance ( $p= 0.021$ ) of eating and drinking while working. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ). Seventy percent of participants mentioned that arranging tasks (e.g., serving food immediately after clearing the table) is important, very important, or extremely important. The statistical results showed no influence of the demographic characteristics considered in this study on the response to the previous question.

**Table (6): perceptions of the participants about wait staff (n = 507)**

Question	Not at all important	Somewhat important	Important	Very important	Extremely important	M±SD
The waiter's hair style (for example, the hair was pulled back, the hair net was used).	126 (24.9)	100 (19.7)	93 (18.3)	87 (17.2)	101 (19.9)	2.9±1.5
Having a uniform.	79 (15.6)	140 (27.6)	119 (23.5)	98 (19.3)	71 (14.0)	2.9±1.3
Hands and nails.	5 (1.0)	21 (4.10)	42 (8.30)	106 (20.9)	333 (65.7)	4.5±0.88
Accessories like earrings	248 (48.9)	102 (20.1)	54 (10.7)	39 (7.7)	64 (12.6)	2.1±1.4
Hand contact with food without gloves	18 (3.5)	16 (3.2)	43 (8.5)	101 (19.9)	329 (64.9)	4.4 ±1.0
Coughing and sneezing	18 (3.5)	10 (2.0)	28 (5.5)	60 (12.0)	391 (77.0)	4.6±0.95
Smoking	45 (8.9)	28 (5.5)	49 (9.7)	67 (13.2)	318 (62.7)	4.2 ±1.3
Eating and drinking while working	152 (30.0)	117 (23.0)	86 (17.0)	42 (8.30)	110 (21.7)	2.7±1.5
Arranging tasks (e.g., serving food immediately after clearing the table)	41 (8.0)	109 (22.0)	132 (26.0)	87 (17.0)	138 (27.0)	3.3±1.3

Figure (4) shows the important elements in the participants' point of view when evaluating the restaurant's quality. About half of the sample (49%) reported that food taste is an important aspect when evaluating restaurant quality. As well, almost 47% of them mentioned that the cleanliness of the restaurant is an important aspect when evaluating the restaurant's quality. The statistical results showed an influence of the type of employment ( $p= 0.000$ ) on the important elements of the evaluation of the restaurant quality. While no influence was found for other characteristics considered in this study ( $p> 0.05$ ).

#### 4. Discussion:

Commitment to good food safety and hygiene practices in restaurants is reflected in the quality of food served, therefore protecting consumers from

FBDs. Recently, many cases of food poisoning have been recorded in different cities in Libya because of eating in restaurants (Abuhlega, 2023). Because of the significant and increasing trend of food consumption outside of the home, there is a need to explore the aspects that consumers judge food safety in restaurants and other eating-out establishments (Henson et al., 2006). The study aimed to evaluate the level of knowledge of a sample of Libyan consumers about hygiene in restaurants, determine which elements consumers consider important when evaluating restaurant hygiene, and determine and analyze whether a random sample of consumers different in gender, age, marital status, type of employment, monthly income, and educational level have different views on restaurant hygiene.

In the present study, females were 61.5%, more than males. The result of this study was similar to a previous study conducted in Libya in which the number of females was higher than males (Abuhlage and Hassan, 2020). On the contrary, in another study, the males were (59.2%), more than females (Abuhlega and Abduljalil, 2022). It is worth observing that a high percentage of participants (82.6%) in this study received a university education or higher. This finding was in line with findings obtained by Abuhlage and Hassan (2020), where a high percentage of the Libyan participants (73.4%) received a university education or higher. Also, in the study carried out by Abuhlega and Maamar (2020), 65.1% of the women received a university education or higher. Since most participants received a university education, targeting them with an educational program about restaurant hygiene will be successful, thus positively reflecting spreading awareness in their families and preventing the incidence of FBDs.

Libyan families' dietary patterns have significantly changed in recent decades, including dining out. This change in dietary patterns is not only in the state of Libya but in the entire world (Kolanowski et al., 2021). The number of times the participants ate out varied over the last six months, but less than half of the sample ate out once a week to once a day. It may be because the majority of the sample earned < 1000 LD. Also, a high percentage of the sample mentioned that they spend  $\leq 25$  LD, which may reflect a low standard of living. Also, it may be because the Libyans rely on takeout meals rather than dining out in restaurants. On the contrary, a study conducted by Alonso and O'Neill (2010) found that 22, 70.8, and 7.2% of Americans dine out daily, once a week, and once a month, respectively.

Many studies have indicated that restaurant cleanliness is a key factor in consumers' evaluation of restaurant quality (Becker et al., 1999; Barber & Scarcelli, 2009; Liu & Jang, 2009). The participants in this study consider the cleanliness of the restaurant to be important to them in general when evaluating

overall restaurant quality, when deciding whether to go back to the restaurant or not, and in increasing or reducing my overall satisfaction level. Kivela et al. (2000); Cullen (2004); Henson et al. (2006) indicated that cleanliness was an important factor when consumers assess food safety in a restaurant. Regarding restaurant budget, about half of the participants agree and strongly agree that they expect a high level of cleanliness in high-budget restaurants, while only about a quarter of them agree or strongly agree that they expect low standards in low-budget restaurants. In a study conducted by Yoo (2012), a higher percentage of participants (98%) had high expectations of cleanliness for high-budget restaurants.

A high percentage of participants tend not to complain if they notice that the restaurant is dirty. There is a need to encourage consumers to submit complaints to ensure their rights and develop food service. In a study conducted by Kolanowski et al. (2021), 31.5% and 22% of consumers in Turkey and Poland, respectively, complained very often when they noticed poor-quality meals. Also, in a study conducted by Abuhlega and Abduljalil (2022), only 44.1% of Libyan consumers reported that they always absolutely refuse and return a food product that they later find defective.

Regarding perceptions about food presented in the restaurant, the food freshness and temperature were considered by the majority of participants as important, very important, or extremely important. To prevent the growth of pathogens, the food temperature should be controlled (Al-Mohaithef et al., 2021), and food must be kept outside the temperature danger zone, which is between 5 and 60 °C (Coorey et al., 2018). On the other hand, how to serve food, food contact surfaces (such as plates and glassware), and unprotected food (for example, seasoning exposed on the table) were less important in the point of view of participants among other questions about food presented in the restaurant.

The perceptions of the participants about the restaurant environment were varied. The presence or evidence of insects in the restaurant and the result of the examination of the restaurant by the competent authorities were the most important from the point of view of the participants. The previous elements may relate directly to food safety. Large numbers of microorganisms, including pathogens, are present on or inside the bodies of many insects, and they can contaminate food and surfaces in contact with food, thus causing illness to humans (Voeller et al., 2008). Consumers desire restaurant hygiene information that may be used to make dining decisions (Filion & Powell, 2011). It is worth noting that, despite the importance of the results of the examination by the competent authorities of the restaurant for participants, the competent authorities did not announce the results of the restaurant inspection to the



public. In the same context, in Libya, the competent authorities did not publish final reports of all the announced food poisoning incidents to inform consumers about the details in terms of responsible food items or pathogens (Abuhlega, 2023).

About the restaurant restroom, the participants considered that the elements, including floors, odor, trash in toilets, and no soap, were the most important. At the same time, they considered no hot water, no paper towels or drying devices, and employee handwashing signage to be less important. It is worth noting that the Libyan standard for health requirements for restaurants and cafes requires hot water and means for drying hands in restrooms (LNS, 2020). The hand-drying method targets not only the dryness of the hands but also the removal of bacteria from washed hands and the prevention of cross-contamination (Huang et al., 2012). In addition, handwashing signage was an effective method to alert handwashing, as people washed their hands more correctly when handwashing signs were available compared to when signage was not present (Cha et al., 2011).

Delivering safe and clean food to consumers is the responsibility of operators at all levels of the food production chain (Thio & Wijaya, 2010). It is estimated that half of the cases of foodborne illness are caused by eating food outside the home, and restaurants are considered the cause of many of these cases as a result of non-compliance with food safety standards (Yoo, 2012). Regarding the perceptions about wait staff, the participants in the study considered the hands and nails, hand contact with food without gloves, coughing and sneezing, and smoking important, very important, or extremely important. It is worth noting that the Libyan standard reports that restaurant workers must wear uniforms, disposable sanitary gloves, and pay attention to nail trimming and cleanliness (LNS, 2020). Therefore, to provide safe food and consumer satisfaction, the operators of the restaurants must comply with Libyan standards. Importantly, foodservice operators must train staff who serve food about proper food serving and handling techniques to minimize the risk to food safety (Thio & Wijaya, 2010).

Food type and quality are specified as important variables in choosing a restaurant, but a restaurant's atmosphere and style can be differential elements in consumers' final decisions (Auty, 1992).

In this study, the taste of food and cleanliness are considered to be the most important aspects when evaluating restaurant quality. Along the same line, Canadians consider that restaurant cleanliness is one of the most important aspects when a customer evaluates restaurant quality and return intention (Kim & Bachman, 2019). On the contrary, in a Malaysian study, cleanliness of the eating place was rated as the third most important factor influencing consumer

restaurant selection after food variety and convenient location, while price was ranked fourth (Fatimah et al., 2011).

### **5. Conclusion:**

Eating out has become commonplace due to the shift in lifestyle. The study provides information on the knowledge of a sample of Libyan consumers about hygiene in restaurants and identifies which elements consumers consider important when evaluating restaurant hygiene, which therefore impacts restaurant choice. Food taste and cleanliness were considered by Libyan consumers to be the most important aspects when evaluating restaurant quality. The study's findings suggest that Libyan consumers require a successful program from the relevant authorities to overcome their deficiencies in restaurant hygiene awareness. Food safety experts may present awareness lectures as part of the program at workshops and seminars. Additionally, by distributing pamphlets or posters outlining the aspects of restaurant hygiene that can be mandated on restaurant owners to distribute or hang within their establishment. Furthermore, responsible competent authorities should sponsor educational programs on radio and television that are concerned with nutritional education for consumers. Food and nutrition associations should also play a role in raising consumers' knowledge about hygiene in restaurants.

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