Knowledge, Attitude, and Practice of Food Safety toward Foodborne Diseases among Libyan Adults in Tripoli

(Original Research Article)

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تاريخ الاستلام: 2024/8/11 تاريخ القبول: 2024 /9/23 تاريخ النشر: 2024/11/16

Abstract: This study is to assess the knowledge, attitude, and practices (KAP) of food safety awareness among public Libyan people in Tripoli city. A cross-sectional study was randomly conducted on 100 (75 males and 25 females) Libyan adults who infected with foodborne illnesses a month before they participated in the questionnaire study. The foodborne illnesses were viral or bacterial infections that spread through foods or drinks into the digestive tract. The participants aged from 18 to 65 years. The study period was from 1 September 2022 to 30 November 2023. The study was carried out using a face-to-face questionnaire. The questionnaire form consisted of questions about personal information, knowledge, attitude, and practice of food safety. Results show that 51% of participants had a university degree and 75% had great awareness of foodborne diseases. Out of 100 participants, 45% were suffering from abdominal cramps after eating contaminated foods. Moreover, 69% of participants had medium income levels. One important finding was that there was a significant difference in knowledge, attitude, and practice about foodborne infections (p values =0.003, 0.004, 0.041, and 0.048, respectively), as well as a substantial correlation between educational level and understanding of the symptoms of foodborne diseases (p value = 0.020). Among public people, a significant association was observed between knowledge, attitude, and practice toward foodborne diseases, serving as an eye opener for future studies to increase knowledge, attitude, and practice among food consumers in Libya.

Key Words: Knowledge, Attitude, Practice, Food Safety, Foodborne Diseases, Tripoli, Libya.

المعرفة والمعتقدات والممارسات المتعلقة بسلامة الاغذية اتجاه الامراض المنقولة بالغذاء بين البالغين الليبيين في طرابلس

المستخلص تهدف هذه الدراسة الى تقييم المعرفة والمعتقدات والممارسات المتعلقة بالتوعية بسلامة الاغذية بين عامة الناس في مدينة طرابلس، ليبيا. اجريت دراسة استبيانيه على 100 ليبي بالغ (75 رجل و25 إمرأة). المشاركين في الاستبيان تم اختيارهم للدراسة عشوائيا وقد تمت اصابتهم ب امراض الصيف المنقولة عبر الاغذية قبل شهر من المشاركة في الدراسة الاستبيانية. الامراض المنقولة غذائيا كانت نتيجة عدوى فيروسية وبكتيرية في القناة الهضمية بسبب تلوث الغذاء.. المشاركين تتراوح اعمارهم من 18 الى 65 سنة. مدة الدراسة الاستبيانية تتراوح من 1 سبتمبر 2022 الى 30 نوفمبر 2023. تم اجراء الدراسة باستخدام الاستبيان وجها لوجه. الاستبيان يتكون من اسئلة حول بيانات شخصية والمعرفة والمعتقدات، والممارسات المتعلقة بسلامة الاغذية. النتائج بينت أن 51% من المشاركين لديهم تعليم جامعي. من ضمن 100 مشارك، حوالي 75 شخص لديهم وعى كبير عن الامراض المنقولة عبر الاغذية وكذلك 45% كانوا يعانون من الم في البطن بعد تناولهم اكل ملوث واصابتهم بالعدوى. علاوة على ذلك، 69% من المشاركين يعيشون بمستوى معيشي متوسط. احدى النتائج المهمة هي وجود اختلاف في المعرفة والمعتقدات والممارسات حول الاصابة بالأمراض المنقولة عبر الاغذية، قيم P كانت 0.003، 0.004، 0.041، 0.048، على التوالي كذلك العلاقة الجوهرية بين المستوى التعليمي وفهم الاعراض الناتجة عن الاصابة بالأمراض المنقولة عبر الاغذية (القيمة P كانت 0.020). ضمن عامة الناس، لوحظ وجود ارتباط بين المعرفة والمعتقدات والممارسات

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اتجاه الامراض المنقولة بالغذاء، وهو ما يعد بمثابة عين مفتوحة للدراسات العلمية المستقبلية لزيادة المعرفة والمعتقدات والممارسات بين مستهلكي الاغذية في ليبيا.

الكلمات المفتاحية: المعرفة، المعتقدات، الممارسات، سلامة الاغذية، الامراض المنتقلة عبر الاغذية، طرابلس، ليبيا.

Introduction:

Consuming food contaminated with microorganisms or their toxins leads to foodborne diseases (1, 2). These diseases can result from cross-contamination of surfaces that come into contact with food or from people who have the microorganisms in their nares and skin (3,4 ,5). Unhygienic methods used in the handling, preparation, and storage of food enhance the growth and spread of pathogens that cause disease, such as bacteria, viruses, parasites, and other food-borne pathogens. Due to the rise in globalization of food production and trade, there is a high risk of food contamination. Some outbreaks of foodborne illness that were localized in a single community may now affect bigger populations or the entire world (6).

Hand hygiene is the most fundamental critical factor for ensuring safe food handling. It has long been known to be a fundamental precautionary measure in health care settings as well as in the kitchen for preventing the spread of infectious disease through human to human or human to food contact (6, 7). Because of their abundance of components, they may encourage the growth of germs in foods like meat, which may be regarded as high-risk foods. Animal-derived foods are most frequently linked to disease outbreaks, including beef, chicken, pig, milk, fish, and eggs. Foodborne illness outbreaks and meat intake are strongly correlated (8, 9). According to the US Centers for Disease Control and Prevention, outbreaks of foodborne diseases that may have been brought by animal products were around 76 million illnesses, 325000 hospitalizations, and 5000 fatalities per year. Even now, not enough is being done to address these public health issues, particularly in developing nations. Particularly in the case of bacterial illnesses that are spread by consumption of meat and meat products, little is known about the exact degree of exposure of different populations to possible dangers (7, 10).

Symptoms of foodborne diseases include nausea, vomiting, diarrhea, abdominal pain (which is severe in inflammatory processes), headache, and fever. Life-threatening neurologic, hepatic symptoms, and renal syndromes may occur several days after intestinal symptoms, and may cause permanent disability or death depending upon microbe is eaten (11,12). The incidence of foodborne illness depends on the hygienic measures concerned in food production and storage, but they could be ineffective if consumers have poor hygienic practices and food handling approaches. Nearly 50% of foodborne illness cases are related to inadequate storage or reheating, while 45% of cases were associated with unfortunate food storage, and 39% of cases came from cross-contamination (13).

Knowledge, attitude and practice are key factors in reducing the incidence of foodborne diseases in foodservice areas (14). They are also influenced by various factors like gender (females have a higher level of information than males), age (people younger than 35 years of age need extra food safety education), income level and cultural factors (15, 16). The aim of the present study is to measure the knowledge, attitude, and practices (KAP) of food safety toward foodborne disease awareness among public people in Tripoli, Libya.

Materials and Methods:

Sample Size and Study Design:

A cross-sectional study was conducted on 100 adults (75 males and 25 females) aged 18 – 65 years from Tripoli, Libya. The study period was from 1 September 2022 to 30 November 2023. 88 participants diagnosed with E. coli O157:H7 infection and 12 participants diagnosed with salmonella infections. All participants had been exposed to summer illnesses a month before they participated in the questionnaire study. The serotype-specific enzyme immunoassays was used for the detection of E, coli O157:H7 from stool samples, whereas salmonella was detected in stool by a culture-independent diagnostic test (CIDT). Medical tests to detect foodborne infections were performed in several special medical laboratories in Tripoli, in addition to the Tripoli Medical Center. The participants were selected randomly in the period lasted for 14 months. The survey was carried out using a face-to-face questionnaire. The questionnaire was in the Arabic language. The data regarding demographic characteristics includes questions about knowledge, attitude, practice, and food safety of foodborne infections.

Statistical Analysis:

The data analysis was performed using the Statistical Software Package for the Social Sciences (SPSS Version 24, Inc., Chicago, Illinois, USA). Descriptive statistics were conducted to determine the means, percentages, standard deviations, and frequencies. A chi-square test (X_2) was used to determine the association of knowledge and practices with demographics. In all tests, $\alpha < 0.05$ was regarded as statistically significant. All confidence intervals (CIs) were calculated at the 95% level of statistical significance.

Results:

Personal Characteristics:

Most cases (65%) aged from 18-35 years, and 30% of cases aged between 35-40 years, while 5% of cases aged from 40 to 65. The majority of cases were males (75%), while the percentage of females reached (25%). The results showed that about 51% of participants had a university education, 25% of participants had a high school diploma, 22% of participants had a preparatory certificate, and 2% of participants had an elementary school diploma. The lowest level was primary level (2%). However, most participants (69%) had an average income level, and 16% of participants had high income level, while 15% of participants had a low income level (Table 1).

Table 1: Distribution of Participants according to Personal Characteristics.

Personal Characteristics	Percentage%
Age (years)	
18-35 yr.	65%
40-35 yr.	30%
40-65 yr.	5%
Sex	75%
Male	25%
Female	
Education Level	
Primary level	2%
Preparatory level	22%

Secondary level University level	25% 51%
Income level Low Medium High	 15% 69% 16%
Total	100%

Knowledge about Foodborne Diseases and their Complications

Out of 100 participants, 75 had strong knowledge toward foodborne infections and their complications, whereas 25% of participants did not have any knowledge. According to knowledge about the symptoms associated with foodborne diseases, 45 % of participants in the questionnaire had abdominal cramps, and the represented the highest percentage. As for other participants, symptoms of vomiting, nausea, and diarrhea occurred in 25%, 15%, and 10% of participants, respectively (Figure 1).

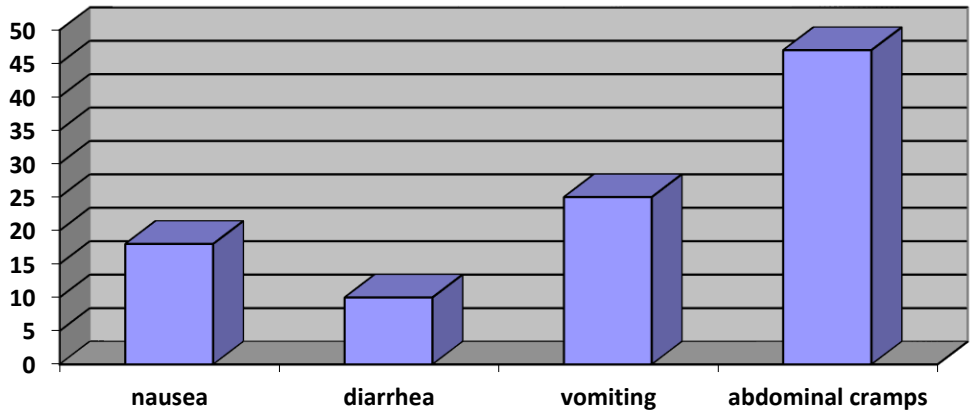

Figure 1: Participants Knowledge about the Symptoms of Foodborne Infection.

The results exhibited that 77% of participants who were infected with summer foodborne diseases had symptoms returned again after recovery. The data also explained the relation between knowledge of participants toward the symptoms of foodborne diseases and their level of educations (Table 2).

Table 2. Relation between Knowledge about the Symptoms of foodborne Infections and Education Level

		Educational Levels				*P* value
		Primary	**Secondary**	**University**	**Total**	**P<0.05**
Symptoms	**Nausea**	1	2	12	16	0.028
	Diarrhea	1	2	28	31	0.018
	Vomiting	0	1	9	10	0.020
	Abdominal Cramps	0	13	30	43	0.020
Total		**2**	**18**	**54**	**100**	

Attitude and Practices about Foodborne Diseases and their Complications

Approximately 76% of participants agrees with attitude foodborne infections and its complications. While 77% of participants were agreed with practice of foodborne infections.

The data regarding to knowledge, attitude, and practice among participants infected with foodborne diseases were statistically analyzed (Table 3).

Table 3: Relation between Knowledge, Attitude, Practice among Participants Infected with Foodborne Diseases.

		Knowledge			
		Yes	**No**	**Total**	**P value**
Agree with Attitude Foodborne Diseases	**Agree**	63	13	76	0.003
	Disagree	12	12	24	0.004
Practices for Foodborne Diseases	**Always**	62	15	77	0.041
	Never	13	10	23	0.048
Total		**75**	**25**	**100**	

Discussion

Participants Diagnosed with Foodborne Diseases:

The results found that the most participants (69%) had an average living life. Referring to the results in this study, most of participants infected with summer foodborne diseases were males (75%) and 65% of individuals were aged from 18 to 35 years. This is because men stay outside the home more than women and may often go out to popular restaurants (14). Also, during the summer, the weather is mostly hot and pathogens like salmonella and E. coli O157:H7 can multiply on foods rapidly to huge numbers, especially in warm and humid situations. So, people get sick when consumed food contaminated by pathogens or their toxins (15, 16). This finding differs from a previous study reported that the main age group of participants infected with foodborne diseases was from 10 to 29 years (96%) and 81.8% of the participants were females (3).

More than half of participants had a university degree (51%), which is the majority of participants (Table 1). While the lowest percentage of participants were those who have an elementary school certificate (2%). This shows that the questionnaire study included participants from different educational levels. In order to improve education and lower the risk of foodborne illnesses, it is vital to examine publics' and students' understanding about food safety. This is because the biggest health issue facing the world now that jeopardizes the public health of millions of people is foodborne illness (11,12, 17).

Participants Knowledge, Attitude, and Practices:

Some symptoms appeared on 100 participants after eating contaminated foods, such as abdominal pain, diarrhea, vomiting, and nausea. Abdominal pains, which were experienced by 45% of participants and accounted for the largest percentage, followed by vomiting, which was experienced by 25%; both may indicate to infection with foodborne diseases (Figure 1). However, these symptoms can also occur as a result of other reasons such as food allergy, a reaction to medicines, and intestinal illness (9, 15).

The study's findings also revealed that 75% of participants had substantial understanding about foodborne diseases. This study found that participants had good knowledge of foodborne infections but had poor attitudes and practices. Results showed that there was no significant difference in participant's knowledge, attitudes, and practices (KAP) across genders, ages, and income levels. However, there was a strong relationship between educational level and knowledge of participants about the symptoms of foodborne infections (p value= 0.020) (Table 2). This finding is similar to the result obtained by a similar study in Malaysia, where the participants had good knowledge but a poor attitude and practice toward

foodborne infections. They found that among 591 surveyed students, 325 (55%) had a good knowledge of food safety knowledge (15, 17).

Results implied that there was a significant difference between knowledge, attitude, and practice toward foodborne diseases (p value = 0.003, 0.004, 0.041, and 0.048), respectively (Table 3). This study finding is similar to the prior study performed in Palestine (16). They suggested that positive correlations were found between participants' knowledge and attitude regarding foodborne infections ($r = 0.24$, $p < 0.005$), Participants with a higher education level who live in a city were the only factors significantly associated with higher knowledge scores (16, 17). This study recommends that public people should attend educational materials, lectures, and workshops related to food safety. Further research is needed to study young and adults people's knowledge, attitudes, and practices related to foodborne diseases.

Conclusion:

Most of cases that participated in the questionnaire about foodborne diseases were men, young, with a university level of education, and an average standard of living. Although there was a significant correlation between knowledge, attitude, and practice about foodborne diseases among 100 Libyan participants. There was also a significant correlation between education and these factors. The results may aid in the development of practical strategies for raising public awareness of foodborne infections and promoting a better understanding of them. They may also serve as a wake-up call for future research aimed at enhancing consumer knowledge, attitude, and practices.

Competing Interests:

We (authors) declare that we have no conflict of interest.

Acknowledgments:

We thank everyone who contributed with us and helped us to complete this research.

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