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Assessment of Kitchen Staff Awareness and Practices Regarding Allergen-Containing Ingredients in Luxor Hotels

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Abstract

This study aims to ascertain the knowledge, attitudes, and behaviors of food handlers in four- to five-star hotels in Luxor regarding food allergies. Additionally, it will investigate the relationship between the scores obtained and the demographic occupational characteristics of the handlers. Using a paper-based questionnaire, 500 food handlers from four- and five-star hotels in Luxor participated in a cross-sectional survey. The study's findings showed a statistically significant direct relationship between kitchen staff members' knowledge of food allergies and their handling of them in Luxor's four and five-star hotels, This implies that the more knowledgeable kitchen staff members are about food allergies, the better their practices will be for treating food allergies in four- and five-star hotels in Luxor. Additionally, there is a statistically significant direct correlation between kitchen staff awareness of food allergens and their attitudes toward food allergies in four- and five-star hotels in Luxor, meaning that the more knowledgeable kitchen staff members are about food allergens, the more those attitudes will be shaped. Also the results reflect a clear understanding of the meaning and concept of food allergy among the respondents, as the total average score for this table reached about 3.79, which reflects a high degree of agreement by the research sample on the statements of this axis and also the mean of the Extent are considered this food allergens ranged between (4.08: 3.49), where the Statements (Milk is a common ingredient in butter, cheese, cream, milk powders and yoghurt) came first, while (Lupin is a flower, but it's also found in flour! Lupin flour and seeds) came last, and The attitude of food allergy ranged between (4.31: 3.26), where the Statements (I am willing to attend food allergy training courses/workshops to learn more about food allergies) came first, while (I do not believe I can effectively handle a food allergy emergency situation at my workplace) came last. And the study recommended that Setting up a control system that contributes to food allergy, Control in the food production and storage process (GMP), employing quick techniques to find allergen residue in goods.

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1. Introduction

Food allergies have become more common in recent decades, raising concerns about food safety on a global scale, Eren et al, (2021) However, the development of effective preventative and treatment techniques is hampered by the poor understanding of the immunological and cellular mechanisms underlying allergic reactions. Yang et al. (2024) Given the rising incidence of food allergies and the increasing frequency of eating out, the knowledge, attitudes, and procedures of employees in the food service industry are vital. The most researched category is knowledge, which exhibits levels that are generally appropriate but occasionally still inadequate. Though they are not always associated with high levels of understanding, positive attitudes are exhibited toward those who disclose allergy problems. The food that is supplied to customers is not safe due to the practices that have been found. The significance of avoiding severe allergy reactions at the moment of food ingestion is not well understood. All employees working in customer service at restaurants and food services should receive training, and procedures should be put in place to stop allergic reactions during food preparation. Service, and set rules for dealing with a client who is having an acute response. Eren et al, (2021)

According to Kumar et al (2022) Food allergies and dietary intolerances are major concerns for the hospitality business, compromising visitor safety and satisfaction. This study article investigates effective hotel management techniques for resolving these nutritional difficulties. Comprehensive staff training open lines of communication, thorough menu information, preventing cross-contamination, preparing meals according to customer specifications, and strong emergency protocols are important tactics. Clear communication aids in precisely identifying and meeting guests' dietary preferences, and staff training guarantees that staff members are capable of identifying and responding to allergic responses. Risk can be reduced by preventing cross-contamination with specialized utensils and stringent hygiene procedures. Sicherer and Sampson (2018). Hotels can accommodate particular dietary needs through customized meal preparation, and well-established emergency protocols guarantee a timely response to allergic reactions. Working together with suppliers guarantees ingredient safety, and visitor input propels ongoing enhancements to allergen management procedures. Hotels may improve visitor happiness, provide a safer eating atmosphere, and establish a solid reputation for meeting a range of dietary requirements by putting these all-encompassing methods into practice to help hotels better handle food allergies and nutritional intolerances, this article examines these practices in detail and gives practical suggestions. Kumar et al (2022) the expertise, attitude, and practices of staff members at Luxor hotels, however, have not been measured in any prior research. This study aims to assess the food handlers' knowledge, attitudes, and practices regarding food allergies at Luxor's four- to five-star hotels. It is anticipated that the conclusions drawn will aid in formulating recommendations and implementing actions.

2. Literature Review

2.1. The concept of Food allergy

Food allergy is an increasingly common disease that often starts in early childhood and lasts throughout life self-reported food allergy has risen at a rate of 1.2% per

decade since 1988, and by 2018, the prevalence of food allergy in the United States was estimated to be 8% in children and 11% in adults, this prevalence has led to an economic burden of almost $25 billion annually. Despite these staggering statistics, as of the time of this writing, the Food and Drug Administration (FDA) has only approved one treatment for food allergy, which is limited to use in children with peanut allergy. Fortunately, a new horizon of therapeutic interventions, in all stages of development, lay ahead and hold promise for the near future Hwang (2022) . Food allergies and nutritional intolerances are becoming more common, which poses a serious problem for the hospitality sector and affects both overall visitor satisfaction and safety. While nutritional intolerances can result in discomfort and health problems if left untreated, food allergies can cause severe reactions that range from minor symptoms to potentially fatal anaphylaxis. Sampson and Sicherer (2018) dietary allergies are defined by Elfotouh et al. (2024) as an unfavorable immune response to a dietary allergen, primarily of a protein origin. An excessive, aberrant immune system response to specific foods is known as a food allergy. It entails the synthesis of a particular type of antibody that causes an allergic reaction when it reacts to a specific food ingredient. Yang, et al (2022) According to NIAID (2012), a food allergy is defined as "an abnormal response to a food triggered by the body's immune system." Eight foods—milk, eggs, peanuts, tree nuts, soy, wheat, fish, and shellfish—are accountable for 90% of allergic reactions. (2014).

2.2. Hospitality Industry Food Allergy Policy

Millions of potential tourists are prevented from engaging in typical tourism activities due to food allergies the travel habits of people with food allergies have not yet been assessed given that there are 15 million food allergy sufferers in the United States, there is a sizable target market for which data collection and analysis are required. Bradley, 2014

Academic studies on restaurant employees' and food and beverage managers' awareness of food allergies may be found in the literature on hospitality and tourism (Borchgrevink et al., 2009). As well as research assessing how people perceive the danger and level of information related to eating at a restaurant where there are food allergies (Kwon and Lee, 2012). The opinions of customers regarding eating out while having dietary restrictions (Lee, 2015). According to research published in the Journal of Human Nutrition and Dietetics, around 1% of Americans suffer with celiac disease (Kwon and Lee, 2012). in a grocery shop or restaurant, discovered that 68% of men and 68% of women with celiac disease did not eat out, and 52% and 55%, respectively, did not travel (Lee, 2015).

2.3. Food allergies may be caused by a number of circumstances.

Food allergy reactions may result from a variety of circumstances, such as cross-contact, misunderstandings between wait staff and cooks, ingredients that restaurants do not specify on their menus, and contact with food residues. Furthermore, food allergies can result from insufficient product labels and concealed allergens in mixed foods (Lee and Barker, 2016). It is clear from taking these things into account that food handlers are crucial in reducing food allergies (Shafie and Azman, 2015). Anyone who works directly with food, comes into contact with food or surfaces that come into contact with it, or handles packaged or unpackaged food or appliances at a food establishment is considered a food handler. Cooks are the ones who handle food in hotels. It is crucial that these people understand the true significance of the problem and have adequate food allergy knowledge, attitudes, and practice levels.

The best way to accomplish this is to train relevant food handlers in food allergies concurrently with food safety. Nonetheless, prior studies have demonstrated that a large number of food handlers receive little to no training about food allergies. (Ahuja and Sicherer, 2007; Lee and Barker, 2016; Lee and Sozen, 2016; Mandabach et al., 2005; Wen and Kwon, 2017). As a significant component of the tourism industry, hotels serve millions of people. Therefore, the most important factors that hotel management must take into account are food safety, hygiene, and sanitation. Both employees and patrons may be at risk for health problems if these concerns are not given enough thought during the food's preparation and serving (Baser et al., 2017). To take remedial action, it is required to disclose the existing state of affairs and to pinpoint the shortcomings planning and implementing training and policies that assist administrative staff and employees will be made easier with an understanding of these gaps (Bailey et al., 2014 (

Public health authorities have become interested in the problem of food allergies, especially in relation to the practices of food handlers, at the same time that the number of deadly allergic response cases has significantly increased. The prevention of potential reactions is greatly aided by food handlers' high level of awareness, attitude, and practice about food allergies. Numerous studies have been carried out to assess restaurant staff members' knowledge, attitudes, and practices regarding food allergies. (Bailey et al., 2014; Choi and Rajagopal, 2013; Common et al., 2013; Sogut et al., 2015; Tatlı and Akoğlu, 2020).

2.4. Food allergies that are most prevalent

Cow's milk, wheat, eggs, peanuts, shellfish, fish, soy, and tree nuts are among the most often reported food allergies. Other exotic allergens, such insects and bird nests, can also cause food allergies in specific regions of the world, including some Asian nations. Sampath (2021). According to the clinical data, the most prevalent food allergies were cow's milk (8%), fish (4%), peanuts (24%), and hen's eggs (35%). According to El-Shabrawy (2021) and Abu-Elfotouh et al. (2023), 16.7% of children in the current study exhibited fruit sensitization, which is comparable to the 20.5% of children who had fruit sensitization. EU Law (2024) states that only the 14 allergens must be notified as such under food law, even though consumers may be allergic or intolerant to other components. Celery, gluten-containing cereals (like wheat, rye, barley, and oats), crustaceans (like prawns, crabs, and lobsters), eggs, fish, lupin, milk, mollusks (like mussels and oysters), mustard, peanuts, sesame, soybeans, sulfur dioxide and sulfurites (if the concentration of sulfur dioxide and sulfurites is greater than ten parts per million), and tree nuts (like almonds, hazelnuts, walnuts, Brazil nuts, cashews, pecans, pistachios, and macadamia nuts) are among the 14 allergens. This also applies to additives, processing aids, and any other ingredients that are included in the finished product.

2.5. The knowledge and behavior of kitchen employees about allergen-containing raw materials

Since it can be challenging to prevent cross contamination in shared kitchen settings, it is crucial that all staff members receive training on how to prevent food cross contamination. A number of studies have been carried out to assess the level of knowledge that food service personnel possess regarding food allergy awareness and prevention practices. When there is a lack of understanding regarding managing food allergies, this might be seen as one of the greatest risks (Leavitt, 2011). According to one study, 25% of eateries believed that a dish was acceptable if an allergen that had

been inadvertently included was removed (Ahuja & Sicherer, 2007). This is completely untrue. Food service professionals were given a true-false questionnaire about food allergy safety and attitudes toward people with food allergies in a 2019 study; 41% of the respondents received a perfect score (Loerbroks, Tolksdorf, Wagenmann & Smith, 2019).

2.6. Staff Training

Raising awareness and providing thorough staff training are the first steps towards managing food allergies and nutritional intolerances in hotels. Since hotel employees frequently serve as the initial point of contact for visitors with special dietary requirements, their capacity to identify, address, and discuss these concerns is essential to guaranteeing the security and contentment of visitors. Staff members should receive comprehensive training on a variety of food allergies and intolerances, including their symptoms and their severity. Employees should receive training on how to recognize signs of an allergic reaction, such as hives, swelling, and trouble breathing, as well as how to respond quickly and effectively in an emergency. Kumar et al (2022)

3. Statement of problem

Food allergies are not always recognized or acknowledged in hotels as well as wait staff should be; in a survey asking restaurant employees to name three major allergens, only 30% of respondents were able to correctly name three food Allergy Education in the Hospitality Industry allergens. Because wait staff lacks knowledge or training, people with food allergies may find it difficult to eat out because they feel powerless, a feeling that has been accelerated by the media, which has made food allergies so humorous that people do not consider them to be a serious issue. Researchers were able to lessen the stigma associated with allergies in a 2017 study by using an instructional film (Abo, Slater & Jain, 2017). Abo et al. (2017) found that employees' awareness and capacity to help visitors improved after they received some instruction on these food allergies. A more uniform approach to educating restaurant staff on food allergies and the harm they cause to those who have them is obviously needed.

4. Research Objectives

The following goals must be accomplished in order to fulfill the study's purpose :

Evaluate the level of food allergy knowledge among culinary employees at four- to five-star hotels in Luxor

Determining the level of awareness among culinary employees regarding food allergies in Luxor's four- to five-star hotels

Assess the attitudes and practices of the kitchen staff about food allergies at Luxor's four and five-star hotels .

5. Research Hypothesis

1- The awareness of food allergies among kitchen employees and their practices regarding food allergies in Luxor's four and five-star hotels do not statistically significantly correlate.

2- In four- to five-star hotels in Luxor, there is no statistically significant correlation between kitchen staff members' awareness of food allergens and their attitudes on food allergies.

6. Methodology

6.1. Research Design

To fully comprehend present procedures and pinpoint opportunities for change, the research design combines quantitative methodologies. With an emphasis on staff training and emergency protocol, the study attempts to collect comprehensive information about kitchen staff procedures regarding food allergies. 6.2. Data Collection

Questionnaires are used in data collection: Kitchen employees at four and five-star hotels in Luxor are given structured questionnaires to complete in order to collect information on their attitudes, behaviours, and current awareness.

6.2. Data Analysis

Data analysis involves quantitative techniques: quantitative analysis statistical methods are used to analyse questionnaires data, identifying common trends, practices this includes calculating frequencies, percentages, and correlations to determine the prevalence of specific practices and their effectiveness.

6.3. Population and Sampling

The study targeted the four and five star' hotels in Luxor and according to Egyptian Hotel Association (2018) counted (13) hotels.

6.4. Reliability and Validity

6.4.1. The questionnaire's reliability: Using the alpha-Cronbach's equation and applying the questionnaire to a survey sample of fifty respondents, the researcher determined the questionnaire's stability. The result was 0.973, indicating that the questionnaire has a high degree of stability.

6.4.2. Validity: The questionnaire's high degree of validity was indicated by the value of (0.986), which was obtained by taking the square root of the reliability coefficient and using self-honesty as an indicator.

6.5. Statistical coefficients used

The following statistical parameters were applied using the "Statistical Package for Social Sciences Spss V.25" program:

- Stability is calculated using Cronbach's alpha coefficient.
- Self-validity is used to determine the study tool's validity.
- Percentages and frequencies.
- The average and standard deviation .
- The relative weight
- Sorting.
- The Pearson correlation value.

7. Results

The questionnaire Analysis

7.1. Description of sample

Table (1) shows the distribution of the study sample according to the variables

Research sample variables		Sample	
		Frequency	%
Gender	Male	369	73.8%
	Female	131	26.2%
	Total	500	100%
Age	From 20 to 30 years	395	79%
	Less than 40 years	21	4.2%
	40 years to 60 years	84	16.8%
	More than 60 years	0	0%
	Total	500	100%
Educational	Intermediate qualification	286	57.2%
	Bachelor's degree	166	33.2%
	Postgraduate studies (diploma - masters - PhD)	48	9.6%
	Total	500	100%
Years of Experiences	Less than 5 years	337	67.4%
	From 5 years to less than 10 years	48	9.6%
	More than 10 years	115	23%
	Total	500	100%
Department	Hot kitchen	282	56.4%
	Cold kitchen	131	26.2%
	Pastry	87	17.4%
	Total	500	100%

The above table makes it evident that all variables for which data was gathered were included in the research sample, as evidenced by the percentages of sample members by gender. came to include (males) at 73.8%, then (females) at 26.2%, and with regard to the variable (age), in the first place, sample members from the age group (From 20 to 30 years) came at 79%, while in the last place came sample members from the age group (Less than 40 years) at 4.2%, and the age group (More than 60 years) did not receive any percentages, and in relation to the variable of education, in

the first place came sample members holding the qualification (Intermediate qualification) at 56.2%, then (Bachelor Degree) at 33.2%, then (Postgraduate studies: diploma - masters - PhD) at 9.6%, as for the variable of years of experience, in the first place came those with experience (Less than 5 years) at 67.4%, then (More than 10 years) at 23%, Then (from 5 years to less than 10 years) by 9.6%. Finally, regarding the variable (section), 56.4% of the sample belonged to the (Hot kitchen) section, then 26.2% belonged to the (Cold kitchen) section, and finally 17.4% belonged to the (Pastry) section

7.2. The Concept of food allergy

The frequency, mean, standard deviation, and ranking of the food allergy concept are displayed in Table (2).

Items	Total sample								
	Frequency					Mean	S.D	Ranking	Degree of agreement
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree				
An unfavorable immune response to a food allergen, primarily of a protein origin, is known as a food allergy.	**67**	**338**	**78**	**8**	**9**	**3.89**	**.71**	**1**	**High**
When a food irritates a person's digestive tract or they are unable to properly digest a food, they may develop a food allergy.	**84**	**317**	**40**	**49**	**10**	**3.83**	**.89**	**2**	**High**
Food allergies are far more prevalent than food allergies and are a reaction of the digestive system.	**93**	**220**	**116**	**71**	**0**	**3.67**	**.93**	**3**	**High**
Total						**3.79**	**0.84**	**High**	

As can be seen from the previous table, the respondents clearly understood the meaning and concept of food allergies, as evidenced by the high degree of agreement the research sample had with the statements of this axis, as indicated by the table's overall average score of roughly 3.79. The findings also demonstrate that, from the respondents' perspective, the definition of food allergy that best captures the meaning of the term is "Food allergy is an adverse immune reaction to a food allergen, mainly of protein nature." This definition is consistent with that of Hwang (2022) and Elfotouh et al. (2024).

7.3. Food Allergens Sources

The frequency, mean, standard deviation, and ranking of the extent of these dietary allergies are displayed in Table (3).

Items	Total sample								
	Frequency					Mean	S.D	Ranking	degree of agreement
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree				
Butter, cheese, cream, milk powders, and yoghurt all contain milk.	103	334	63	0	0	4.08	.57	1	High
Crustaceans include prawns, lobster, crabs, and scampi.	99	310	81	3	7	3.98	.71	2	High
Sulphur dioxide (sometimes known as sulphites	85	284	112	16	3	3.86	.74	3	High
Celery consists of celery stalks, leaves, seeds, and celeriac, a root.	82	291	77	50	0	3.81	.82	4	High
Cakes, mayonnaise, mousses, and certain meat products frequently contain eggs.	107	260	43	63	27	3.71	1.10	5	High
Cereals made with gluten wheat (Khorasan wheat/Kamut and spelt)	63	246	152	36	3	3.66	.81	6	High
You can find fish in salad dressings, pizzas, relishes, and even fish sauces.	52	298	80	70	0	3.66	.84	7	High
Mollusks These consist of whelks, squid, land snails, and mussels.	64	237	166	30	3	3.65	.79	8	High
Nuts, Peanuts, Sesame seeds, Soya	61	268	104	67	0	3.64	.86	9	High
This group includes mustard seeds, mustard powder, and mustard liquid.	31	276	132	56	5	3.54	.81	10	High
In addition to being a flower, lupin may be found in flour! Lupin seeds and flour	78	197	125	95	5	3.49	1	11	High
Total						3.73	0.82	High	

As can be seen from the previous table, the statements "Milk is a common ingredient in butter, cheese, cream, milk powders, and yoghurt" came first, while "Lupin is a flower, but it's also found in flour! Lupin flour and seeds" came last. The mean of the

extent that these food allergens are considered ranged between 4.08 and 3.49. Since the total average score for this table was approximately 3.73, which indicates a high degree of knowledge and awareness, the numbers in the previous table demonstrate the high level of awareness of the research sample regarding foods that cause allergies. Abu-Elfotouh et al. (2023) and El-Shabrawy (2021) The EU's 2024 legislation states

7.4. Food allergen Awareness

The frequency, mean, standard deviation, and ranking of food allergen awareness are displayed in Table (4).

Items	Total sample								
	Frequency					Mean	S.D	Ranking	Degree of agreement
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree				
Food allergies can have a negative impact on a person's health and can have major repercussions for certain individuals.	182	245	39	0	34	4.08	1.02	1	High
When two foods come into contact and their proteins mix, this is known as cross-contact.	107	308	85	0	0	4.04	0.62	2	High
To prevent food allergen cross-contact, every step from the field to the visitor should be controlled.	109	266	125	0	0	3.97	0.68	3	High
Food allergy is similar to food intolerance	77	292	123	8	0	3.88	0.67	4	High
Lactose intolerance is similar to milk allergy	65	291	144	0	0	3.84	0.63	5	High
A food allergy is an abnormal response of the immune system to an ordinarily harmless food or ingredient in a food	76	305	97	3	19	3.83	0.83	6	High
Food allergy can be serious but is not common	55	295	147	3	0	3.80	0.62	7	High
Food allergy can be result in death in severe cases	74	259	164	0	3	3.80	0.70	8	High
Individuals who suffer from allergies typically come from households where allergies are prevalent.	59	293	139	0	9	3.79	0.72	9	High
Reactions to food allergies might happen anywhere from two minutes to twelve	59	283	148	7	3	3.78	0.69	10	High

hours.									
Food allergies can be destroyed by high-temperature cooking methods like roasting, baking, and deep-frying.	**61**	**269**	**127**	**43**	**0**	**3.70**	**0.79**	**11**	**High**
If they just eat a small quantity of the item that triggers their sensitivities, people with food allergies can safely eat it.	**47**	**250**	**189**	**11**	**3**	**3.65**	**0.70**	**12**	**High**
Allergic reactions can be seen at the contact points of the food, such as lips or tongue, as well as throughout the body	**89**	**231**	**91**	**74**	**15**	**3.61**	**1.04**	**13**	**High**
Both adults and children can have food allergies to fish and seafood.	**50**	**193**	**181**	**73**	**3**	**3.43**	**0.88**	**14**	**High**
Food allergens are usually proteins	**64**	**195**	**132**	**102**	**7**	**3.41**	**1.00**	**15**	**Moderate**
The most significant and prevalent food allergy in children is cow's milk.	**35**	**219**	**124**	**40**	**82**	**3.17**	**1.19**	**16**	**Moderate**
Total						**3.73**	**0.79**	**High**	

As can be seen from the above table, the statements "Food allergies can adversely affect human health and may have serious consequences for some people" and "Cow milk is the most important and common allergic food for children" came first and last, respectively, in the Mean of Food Allergen Awareness range of 4.08 to 3.17. As the total average score for this table was approximately 3.73, which indicates a high degree of knowledge and awareness and is consistent with (Loerbroks, Tolksdorf, Wagenmann & Smith, 2019), the values in the preceding table demonstrate the high level of awareness of food allergens among the research sample.

7.5. Attitude of food allergy

The frequency, mean, standard deviation, and ranking of food allergy attitudes are displayed in Table (5).

Items	**Total sample**								
	Frequency					**Mean**	**S.D**	**Ranking**	**Degree of agreement**
	Strongly agree	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**				
To learn more about food allergies, I'm willing to go to workshops or training sessions.	**211**	**232**	**57**	**0**	**0**	**4.31**	**0.66**	**1**	**Very High**

Food allergies should, in my opinion, be better understood by those who prepare food.	**150**	**283**	**67**	**0**	**0**	**4.17**	**0.64**	**2**	**High**
I believe that knowledge about food allergies would make me more confident about handling food at my workplace	**152**	**275**	**70**	**3**	**0**	**4.15**	**0.67**	**3**	**High**
When allergenic materials are utilized in food, I believe the food label should explain these allergies.	**141**	**285**	**74**	**0**	**0**	**4.13**	**0.64**	**4**	**High**
Food allergies have a significant role in my work.	**108**	**341**	**51**	**0**	**0**	**4.11**	**0.55**	**5**	**High**
I think that if staff members are mindful of food allergens, I can prevent food allergies.	**120**	**294**	**86**	**0**	**0**	**4.07**	**0.64**	**6**	**High**
I think having a food allergy will help me in both my personal and professional life.	**135**	**275**	**66**	**7**	**17**	**4.01**	**0.87**	**7**	**High**
I think I should learn how to deal with food sensitivities and allergies from my supervisor.	**68**	**332**	**84**	**13**	**3**	**3.90**	**0.67**	**8**	**High**
I think the food made in the kitchen is reliable when it comes to food allergies.	**67**	**298**	**132**	**3**	**0**	**3.86**	**0.63**	**10**	**High**
In my opinion, food allergies are not sufficiently covered in the field-related curricula (cooking, gastronomy, etc.).	**94**	**259**	**100**	**20**	**27**	**3.75**	**0.99**	**11**	**High**
I don't think I'm capable of managing a food allergy situation at work.	**52**	**225**	**102**	**43**	**78**	**3.26**	**1.23**	**12**	**High**
Total						**3.99**	**0.72**	**High**	

The preceding table makes it clear that the mean attitude toward food allergies ranged from 4.31 to 3.26. The statements that came first were "I am willing to attend food allergy training courses/workshops to learn more about food allergies" and "I do not believe I can effectively handle a food allergy emergency situation at my workplace." Given that the overall average score for this table was approximately 3.99, which indicates a high degree of agreement, the numbers in the preceding table demonstrate the existence of favorable tendencies by the research sample towards detecting food allergies and the causes, factors, and others related with them. Additionally, in accordance with EU law (2024), this conclusion is consistent with Kumar et al. (2022), El-Shabrawy (2021), and Abu-Elfotouh et al. (2023).

7.6. Items in practice towards food allergy

The frequency, mean, standard deviation, and ranking of items in practice related to food allergies are displayed in Table (6).

Items	Total sample								
	Frequency					Mean	S.D	Ranking	Degree of agreement
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree				
Clean all the utensils before preparing food to prevent cross-contact	226	231	43	0	0	4.37	0.64	1	Very High
I use clean and sanitized equipment and utensils at my workplace to prevent cross contact between allergens	192	268	40	0	0	4.30	0.61	2	Very High
I wash my hands thoroughly with soap and ater and wear a fresh pair of gloves before preparing an allergen-free meal	153	332	15	0	0	4.27	0.51	3	Very High
I wear clean uniforms in food preparation	150	329	21	0	0	4.25	0.52	4	Very High
Check the ingredients and read the contents before using the packaged foods	183	260	52	5	0	4.24	0.67	5	Very High
I prepare allergen-free foods to prevent cross contact	165	282	53	0	0	4.22	0.62	6	High
When preparing fried food for patrons with a food allergy, I make sure that I change the oil in the deep fryer to prevent cross contact	163	271	66	0	0	4.19	0.65	7	High
Use separate equipment (tongs, ladles) for handling allergen-containing foods	165	278	44	13	0	4.19	0.70	8	High
I use cap or bone when preparing food	131	318	45	0	6	4.14	0.67	9	High
When preparing the eight most common food allergens, I pay more attention to food processing practices	144	276	63	17	0	4.09	0.74	10	High

If a mistake is made when preparing a meal for a food allergic customer, I remake the food	**145**	**234**	**95**	**26**	**0**	**4.00**	**0.83**	**11**	**High**
I store allergen-free foods and allergen foods in the same places	**56**	**166**	**38**	**97**	**143**	**2.79**	**1.44**	**12**	**High**
Total						**4.08**	**0.71**	**High**	

The preceding table makes it clear that the mean of items in practice related to food allergies ranged between 4.37 and 2.79. The statements "I store allergen-free foods and allergen foods in the same places" came last, while "Clean all utensils before preparing food to prevent cross-contact" came first. Given that the overall average score for this table was approximately 4.08, indicating a high degree of agreement, the numbers in the preceding table demonstrate the existence of varied practical practices with food allergies. Additionally, the outcome is consistent with the findings of Bailey et al. (2014), Choi and Rajagopal (2013), Common et al. (2013), Sogut et al. (2015), and Tatlı and Akoğlu (2020).

7.7. Test the hypotheses of the study:

7.7.1. Verification of the first hypothesis

There is no statistically significant relationship between the Awareness of food allergy of Kitchen staff and their practice towards food allergy in four- and five-star hotels

Table (7) shows the correlation coefficients between Awareness of food allergy of Kitchen staff and their practice towards food allergy in four- and five-star hotels in Luxor

Variables	**Practice towards food allergy in four- and five-star hotels in Luxor**		
	Correlation Value	**Sig**	**Type of Sig**
Awareness of food allergy of Kitchen staff	**0.527****	**0.01**	**Statistically significant**

(**)significant at the 0.01 level.

The results of the preceding table make it evident that there is a direct association that is statistically significant. the awareness of food allergy of Kitchen staff and their practice towards food allergy in four and five star hotels in Luxor, Which means that the more aware kitchen staff are of food allergies, the better their practices will be towards treating food allergies in four and five star hotels in Luxor.

7.7.2. Verification of the second hypothesis:

There is a statistically significant relationship between food allergens Awareness of Kitchen staff and their Attitude of food allergy in four –five-star hotels in Luxor.

Table (8) shows the correlation coefficients between food allergens Awareness of Kitchen staff and their Attitude of food allergy in four –five-star hotels in Luxor

Variables	Attitude of food allergy in four –five-star hotels in Luxor		
	Correlation Value	Sig	Type of Sig
Food allergens Awareness of Kitchen staff	0.380**	0.01	Statistically significant

(**) significant at level of 0.01.

It is clear from the results of the previous table there is a statistically significant direct correlation food allergens Awareness of Kitchen staff and their Attitude of food allergy in four –five star hotels in Luxor, Which means that the more aware kitchen staff are of food allergens, the more it will shape their attitude towards food allergens in four and five star hotels in Luxor.

8. Conclusions, implications, and further research and Recommendations

Natural proteins that are resistant to heat, proteolytic enzymes, and pH changes are known as allergens in food. An individual's immune system can respond to trace amounts of current allergens (measured in parts per million). Individuals react differently to the same allergen and exhibit varying levels of sensitivity. A person with an allergy can only avoid a reaction by avoiding contact with an allergen. The purpose of this study was to ascertain the knowledge, attitudes, and behaviors of food handlers employed by four- to five-star hotels in Luxor regarding food allergies. Additionally, the study sought to investigate the relationship between the scores obtained and the demographic and occupational characteristics of the handlers. 500 food handlers working in Luxor's four- and five-star hotels participated in a cross-sectional poll.

Was conducted using a paper-based questionnaire. The findings of the study demonstrate a statistically significant direct relationship between the knowledge of food allergies among kitchen employees and their treatment of food allergies in four and five-star hotels in Luxor. This implies that the more knowledgeable kitchen employees are about food allergies, the better their practices will be in treating food allergies in these establishments. In four- and five-star hotels in Luxor, there is a statistically significant direct correlation between kitchen staff awareness of food allergens and their attitude toward food allergies. This means that the more knowledgeable kitchen staff members are about food allergens, the more that will influence their attitude toward food allergies. A high degree of agreement between the research sample and the statements of this axis is indicated by the results, which show that respondents clearly understand the meaning and concept of food allergies. The mean score for the extent of these food allergens ranged from 4.08 to 3.49, with the statements "Milk is a common ingredient in butter, cheese, cream, milk powders, and yoghurt" coming first and "Lupin is a flower, but it's also found in flour! Lupin flour

and seeds" coming last, With the statements "I am willing to attend food allergy training courses/workshops to learn more about food allergies" coming first and "I do not believe I can effectively handle a food allergy emergency situation at my workplace" coming last, the attitude toward food allergies ranged from 4.31 to 3.26.

8.1. Recommendation

Senior management should oversee the following, in accordance with the earlier findings:

- Control in the food production and storage process (GMP), utilizing instruments that can confirm carried out control (rules, labeling.(
- Employing quick techniques to find allergy residue in goods
- Creating training programs for all hotels run by the Egyptian Hotel Federation to increase staff awareness, productivity, and understanding of food allergies
- Creating new culinary events and food festivals Improving societal attitudes and behaviors about food allergies
- Implementing a control system that exacerbates food allergies

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