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Improving food handlers knowledge about food safety in Ismailia city hospitals, Egypt

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Abstract

Background: Food-borne diseases become of paramount importance in hospitals. Hospitals have been identified as high food safety risk institutions because they serve potentially hazardous foods to vulnerable people. These people are more susceptible to food-borne illnesses than the general population and consequently food contamination by pathogens could be particularly harmful.

Aim of This Study: was to prevent the development of food borne illnesses and its consequences on hospitalized patients.

Methods: This quasi experimental study was conducted on 132 workers in food catering services in Ismailia city hospitals to assess the effects of an educational program about food safety on the following main outcome measures knowledge, attitude and practice of food handlers about food safety. Data were collected by using a predesigned questionnaire adapted from WHO including two components: the first one to assess the baseline level of knowledge and attitude while the other one is an observational checklist to evaluate their practices about food safety and food hygiene before and after the intervention.

Results: The overall knowledge scores increased significantly between (9.2±5.3) before the intervention and (18.5±3.9) after the intervention with p value ($P<0.05$). Also both attitude and practices scores increased significantly between 14.0±3.3 and 35.0±8.9 before the intervention and 17.9±1.5 and 45.8±5.2 after the intervention respectively.

Conclusion: The educational program had a positive impact on staff knowledge, practices and attitudes. There was a significant improvement after attending the educational program.

Keywords: Knowledge, attitude, practice, educational program, food safety

Introduction

Food is the most important item to sustain life on this planet, next only to oxygen; it is a potent source of pathogens, toxins and disease. Unsafe food causes many acute and life-long diseases, ranging from diarrheal diseases to various forms of cancer. Foodborne diseases and threats to food safety constitute a growing public health problem. WHO estimates that foodborne and waterborne diarrheal diseases taken together kill about 2.2 million people annually, 1.9 million of them children and about 70% from developing countries^[1].

CDC estimates that each year roughly 1 in 6 Americans (or 48 million people) gets sick, 128,000 are hospitalized, and 3,000 die of foodborne disease^[2]. WHO defines food safety as the conditions and measures that are necessary during production, processing, storage, distribution and preparation of food to ensure that it is safe, sound, wholesome and fit for human consumption^[3]. Food safety remains a critical issue nowadays among professionals in the food service sector as well as consumers^[4, 5]. This is basically due to outbreaks of food-borne diseases resulting in substantial costs to individuals and the economy^[6, 7].

Food safety is directly related to the harmful substances present in it. Any substance that is reasonably likely to cause harm, injury or illness, when present above an established acceptable level, is a food safety hazard. Food hazards in foods may arise from different sources. They can be natural components of the food itself, they can arise from contamination of the food during any stage of the production, processing, storage and distribution or can be a result of decomposition and deterioration of the food items. In most countries regulatory bodies have established acceptable limits for all types of hazards^[8].

The World Health Organization (WHO) has long been aware of the need to educate food handlers about their responsibilities for food safety. In the early 1990s, WHO developed the Ten Golden Rules for Safe Food Preparation, which were widely translated and reproduced.

However, it became obvious that something simpler and more generally applicable was needed. After nearly a year of consultation with food safety experts and risk communicators, WHO introduced the Five Keys to Safer Food poster in 2001. The Five Keys to Safer Food poster incorporates all the messages of the Ten Golden Rules for Safe Food Preparation under simpler headings that are more easily remembered and also provides more details on the reasoning behind the suggested measures ^[9].

Especially in hospitals, food hygiene requires attention to detail in relation to all preventive measures to minimize the hazards of food poisoning, particularly given the presence of "consumers" (hospitalized patients at risk) who often are more vulnerable than healthy subjects ^[10]. In hospital catering, food-services staff are the main food handlers, although nurses and other domestic staff may distribute or serve meals. Food-services staff in hospitals represents a potential source of nosocomial foodborne outbreaks, since they may possibly introduce pathogens into foods during every phase from purchase to distribution ^[10, 11].

Methods

The study was conducted at four hospitals in Ismailia city which were Suez Canal university hospital, Ismailia general hospital, Ismailia chest hospital and Ismailia fever hospital. During the period from December 2014 and March 2015.

The study was a quasi experimental study (Pre-post intervention design) was conducted on 132 workers in food catering services in Ismailia city hospitals to assess the effects of an educational program about food safety on the following main outcome measures knowledge, attitude and practice of food handlers about food safety.

Data were collected by using a predesigned questionnaire adapted from WHO including two components: the first one to assess the baseline level of knowledge and attitude while the other one is an observational checklist to evaluate their practices about food safety and food hygiene before and after the intervention.

The study participants were including department's officers, nutritionists, supervisors, food handlers, chefs, waiters, Stores keepers and cleaners who work also for the catering companies.

All statistical analyses were performed using the SPSS statistical package for social science version 16.

Results

This study included 132 participants distributed as; 70 at

Suez Canal University Hospital, 30 at Ismailia General Hospital, 15 at Ismailia Chest Hospital and 17 at Ismailia Fever Hospital.

Regarding general characteristics of the studied participants, their age ranged from 22 to 61, with a mean of 37.5 years. The majority of food handlers were males (52.3%). The majority of the participants (59.1%) had high secondary school education (technical education), 6.8% secondary school education and 26.5% university education. Regarding working experience, 53% of the participants had less than 10 years of working experience in food handling, 26.5% had working experience more than 10 years and 20.5% had working experience more than 20 years. Most of them were technicians; 42.4%, while 14.4% as cooks, 10.6% supervisors and 13.6% others who work as cleaners and assistants who sometimes assisted in the food preparation and distribution among the studied participants, 53% of them were from university hospital, 22.7% of them were from general hospital, 12.9% of them were from fever hospital and 11.4% were from chest hospital (table 1).

Regarding food safety knowledge before and after the training the overall, knowledge scores increased significantly between (9.2±5.3) before the intervention and (18.5±3.9) after the intervention with p value ($P<0.05$) denoting significant difference in the level of food safety knowledge between pre and post test scores (table 2).

Regarding study participants' attitudes before and after the intervention, the results show that attitude scores increased significantly between 14.0±3.3 before the intervention and 17.9±1.5 after the intervention. In total it appeared that there was improved food safety attitude by 27.9% between the pre-test and the post-test with a statistically significant difference ($p<0.05$) (figure 1).

Regarding study participants' practices before and after the intervention, the results show that overall practice scores increased significantly between 35.0±8.9 before the intervention and 45.8±5.2 after the intervention. In total it appeared that there was improved food safety practices between the pre-test and the post-test with a statistically significant difference ($p<0.05$) (table 3).

Tables (4), (5) and (6) show the scores of study participants' food safety knowledge, attitude and practices before and after the intervention for each hospital separately. There was improved food safety knowledge, attitudes and practices between the pre-test and the post-test with a statistically significant difference ($p<0.05$), for each hospital.

Table 1: General characteristics of the studied participants (n=132)

General Characteristics		
Age (years)	Mean ± SD	37.5±9.5
	Range	(22-61)
Gender Frequency (%)	Male	69 (52.3)
	Female	63 (47.7)
Educational level Frequency (%)	Illiterate	5 (3.8)
	Read and write	3 (2.3)
	Primary education	2 (1.5)
	Secondary education	9 (6.8)
	High secondary education	78 (59.1)
Working experience (years)	Mean ± SD	10.5±8.8
	Range	(1-33)
Working activity Frequency (%)	Technician	56 (42.4)
	Cooker	19 (14.4)
	Supervisor	14 (10.6)

Place of work Frequency (%)	Dietitian	13 (9.8)
	Assistant cooker	12 (9.1)
	Others	18 (13.6)
	University hospital	70 (53)
	General hospital	30 (22.7)
	Fever hospital	17 (12.9)
	Chest hospital	15 (11.4)

Table 2: Comparison of Knowledge scores before and after the health education program among the studied participants (n=132)

Items	Before	After	% Change	P-value
	Mean ± SD	Mean ± SD N %		
Personal hygiene (6)	2.4±1.8	4.8±1.3	100.0	<0.0001*
Food storage (2)	0.4±0.6	1.5±0.7	275.0	<0.0001*
Food hygiene, handling & Serving (9)	3.6±2.3	7.4±1.6	105.6	<0.0001*
Cleaning & sanitation (3)	1.3±0.9	2.5±0.7	92.3	<0.0001*
Environmental hygiene (3)	1.3±0.9	2.3±0.8	76.9	<0.0001*
Total knowledge score (23)	9.2±5.3	18.5±3.9	101.1	<0.0001*

*paired t-test is statistically significant at level of confidence at 95%.

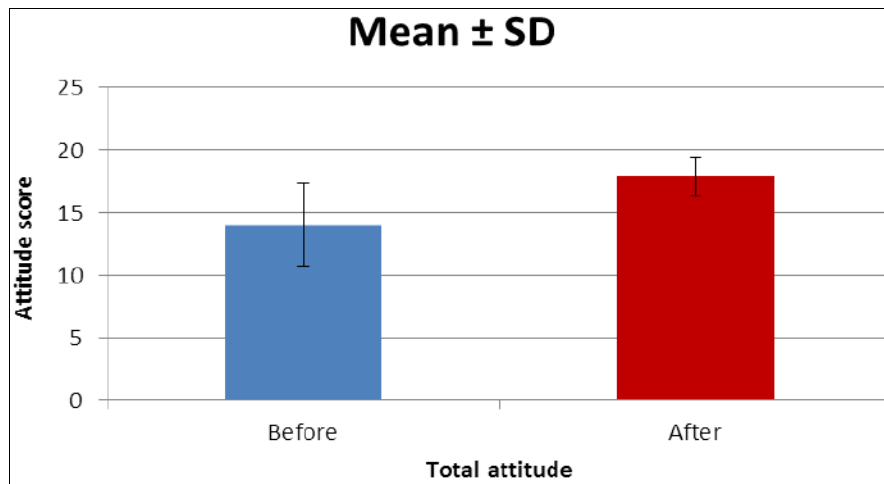


Fig 1: Attitude scores before and after the health education program among the studied participants (n=132)

Table 3: Comparison of practice scores before and after the health education program among the studied participants (n=132)

Items	Before	After	% change	P-value
	Mean ± SD	Mean ± SD N %		
Personal hygiene (12)	6.2±2.5	9.0±1.9	45.2	<0.0001**
Food storage (15)	7.1±2.4	9.9±1.7	39.4	<0.0001**
Food hygiene, handling & Serving (21)	13.7±3.0	16.6±1.9	21.2	<0.0001**
Cleaning & sanitation (12)	8.1±2.1	10.2±1.7	25.9	<0.0001**
Total Practice score (60)	35.0±8.9	45.8±5.2	30.9	<0.0001**

*paired t-test is statistically significant at level of confidence at 95%.

Table 4: Comparison of knowledge score before and after in different hospitals among the studied participants (n=132)

Items	Before	After	Mean % change	T-value	P-value
	Mean ± SD	Mean ± SD N %			
Chest	6.8±5.2	17.1±4.9	331.6	-6.569	<0.0001*
Fever	10.8±4.1	19.5±2.4	119.7	-8.813	<0.0001*
General	9.7±4.1	17.2±3.8	106.7	-9.999	<0.0001*
University	9.1±6.1	19.1±3.9	248.2	-17.240	<0.0001*
F-value	1.688	2.793	3.211	-----	-----
P-value	0.173	0.043**	0.025**	-----	-----

*paired t-test is statistically significant at level of confidence at 95%.

**ANOVA test is statistically significant at level of confidence at 95%.

*paired t-test is statistically significant at level of confidence at 95%.

** ANOVA test is statistically significant at level of confidence at 95%.

Table 5: Comparison of Attitude score before and after in different hospitals among the studied participants (n=132)

Items	Before	After	Mean % change	T-value	P-value
	Mean ± SD N %	Mean ± SD N %			
Chest	12.5±3.2	17.5±1.8	49.9	-4.704	<0.0001*
Fever	15.9±2.2	17.5±1.0	12.6	-2.592	0.020*
General	14.0±3.2	18.7±1.5	42.4	-7.735	<0.0001*
University	13.9±3.4	17.8±3.4	36.1	-9.597	<0.0001*
F-value	3.146	4.065	2.935	-----	-----
P-value	0.027**	0.009**	0.036**	-----	-----

*paired t-test is statistically significant at level of confidence at 95%.

** ANOVA test is statistically significant at level of confidence at 95%.

Table 6: Comparison of Practice score before and after in different hospitals among the studied participants (n=132)

Items	Before	After	Mean % change	t-value	P-value
	Mean ± SD N %	Mean ± SD N %			
Chest	32.3±9.4	44.1±4.4	51.8	-5.412	<0.0001*
Fever	40.7±5.0	46.4±5.5	16.7	-2.491	0.024*
General	37.4±5.5	47.5±4.7	29.3	-8.305	<0.0001*
University	33.2±9.9	45.3±5.5	44.9	-13.430	<0.0001*
F-value	4.919	1.967	4.237	-----	-----
P-value	0.003**	0.122	0.007**	-----	-----

*paired t-test is statistically significant at level of confidence at 95%.

** ANOVA test is statistically significant at level of confidence at 95%.

Discussion

This is Pre-post intervention study was used to assess the effects of a health educational program about food safety on the following main outcome measures knowledge, attitude and practice of food handlers working at four hospitals in Ismailia city (Suez canal university hospital, Ismailia general hospital, Ismailia chest hospital and Ismailia fever hospital).

The current study showed that knowledge scores increased significantly between (9.2±5.3) before the intervention and (18.5±3.9) after the intervention with p value (P≤0.05) denoting significant difference in the level of food safety knowledge between pre and post intervention scores.

In the current study the mean score of knowledge was 8.9±5.8 in males and 9.4±4.7 in females with p value 0.6 which was not statistically significant and only (15.9%) of the study participants were knew about food safety from mass media.

This was in agreement with the study of Sung-Hee Park *et al.*, (2010) whose study was evaluation of the food safety training for food handlers in restaurant operations found that Employee knowledge of the intervention group also showed a significant improvement in their score, increasing from 49.3 before the training to 66.6 after training [12].

In the current study, it was found that attitude scores increased significantly between 14.0±3.3 before the intervention and 17.9±1.5 after the intervention. In total it appeared that there was improved food safety attitude by 27.9% between the pre-test and the post-test with a statistically significant difference (p<0.05).

This was in agreement with the study of Al-Mohaithef, (2014) it was found that, foodservices staff had positive attitudes regarding food hygiene issues. Both groups (control and intervention) obtained high level initially, although of the intervention group’s attitudes had a significant improvement after training (p<0.01). The mean scores for the intervention group was 19.8 (79.2%) before the training and increased to 21.1(84.4%) after. This indicates that, food safety training can also affect staff’s attitudes [13].

This was in controversy with the study of Ehiri *et al.*, (1997) since they did not detect any improvements in the control group’s knowledge, attitudes and opinions in the pre and post-tests [14].

The current study results show that overall practice scores increased significantly between 35.0±8.9 before the intervention and 45.8±5.2 after the intervention. In total it appeared that there was improved food safety practices between the pre-test and the post-test with a statistically significant difference (p<0.05).

According to Al-Mohaithef, (2014), There was no difference between both groups in the first test (p>0.05). The mean scores for the control group was 9/10(90%) and 8.7/10(87%) for the intervention group. Although both groups showed a high level of good practices, there was a significant improvement after the training in the intervention group (p<0.05). After the training, the total mean scores for the intervention group increased to 9.7/10(97%) while those for the control group showed a minor decrease to 8.8 (88%) [13].

This was in controversy with the study of Park *et al.*, (2010), who found that in terms of employee practices and the sanitation performance, there were no significant increases after the training [12].

Conclusion

The educational program had a positive impact on staff knowledge, practices and attitudes. There was a significant improvement after attending the educational program.

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