

Effectiveness evaluation of an Information booklet as a way of training on improving the knowledge and practice on food safety among food handlers in companies' restaurants

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Abstract: Introduction: According to World Health Assembly in 2000, food safety has more and more come to be a worldwide concern. Supplying food handlers with essential knowledge and good practice is playing a major task nowadays. To avoid the spreading of food born diseases, it is essential to accept the food handlers an appropriate training courses about the healthy manipulation of foods and the source of infection. The purpose of food handlers training is to offered much or less of experiences for handling of foods by healthy manner. In spite of several of eating places are improved day by day, but the methods for handling of different kinds of food still are insufficient. **Aim of the work:** was to investigate the role of knowledge and training of food handlers on degree of food safety and to verify the influence of supplying with a knowledge booklet on food safety amongst food handlers. **Subjects and methods:** Two designs were applied in the present work, 1. Phase study - descriptive survey design in phase I and 2. One group pretest/posttest design in phase II. Knowledge had been obtained from 268 companies' restaurant workers via structured questionnaire on food safety for estimating the reciprocal knowledge and experience. **Result:** Most of the topics (59.1%) were carrying poor knowledge, while 40.1% of the participants had moderate knowledge and no of participants possess a good knowledge on practice on food safety. Concerning the experience on food safety, 52.2% of them had moderate information, whereas, 40.1% of participants had poor information and 7.7% only had good knowledge. **In conclusion,** the guideline booklet was efficient to supply with the required knowledge and improved the practice in the field of food safety between the workers in many companies.

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1. Introduction

Nowadays, the sources of pollution beside the deterioration in the foods either from plant or animal origins are increased steadily. So, eating of foods with good quality, under hygienic conditions, offered freshly on demand time is efficient for keeping good health. However recently the issue about the degree of safeness of consumed foods are discussed with details. It has turn out to be a difficulty to determine either the community under threaten or not from foods administered via the companies or in the restaurants. World Health Organization (WHO, 2000) indicated that nearly 70% of the 2 million deaths due to diarrhea in developing countries in the world yearly were conducted with contaminated food. On a daily basis, hundred thousands of men and women die from avoidable food borne illnesses. With respect to developing countries in Asia and Africa, about 1.8 million kids below 5 years old die yearly from diarrheal health problem, 70% of those kids are affected with infections transmitted from food borne microorganisms. Other sources estimated more than 200 diseases can be transmitted via contaminated foods, where 76 million patients, 350,000 hospitalizations and 5000 deaths due to diseases of

food origin yearly. Additionally in more than a few of advanced countries, nearly 60% of food borne diseases are prompted by using improper methods of food handling and through the polluted food offered by food service establishments (1). In some countries such as India, roughly 3 million kids under five years are die yearly due to affection with diarrhea and 70% of the mortality are due to food borne diseases (2).

In England, 19 human being were affected with Salmonellosis during eating in one of restaurants in United kingdom, the appeared symptoms were, 100 % complained from diarrhea and belly pains, 98% complained from fever and vomiting and duration of symptoms ranged from 1-17 days. A different outbreak due to Staphylococcosis which affect 7 humans who consumed contaminated fast meals (corned beef sandwiches) as a result of improper handling by two workers in the restaurant suffering from nasal discharges (3). An additional condition, one young person die in Kerala who eaten food contaminated with toxins excreted by bacteria, called *Staphylococcus aureus* (5). Probably the most foremost factors for these accidents was resulting from unhygienic manipulation of foods due to lack of

experience and healthy instructions for the employers in the food factories or food handlers.

An predominant concern connected to food poisoning is the lack in the database concerned with documentation of food borne diseases and the misunderstanding of the severity of food borne illnesses and it was frequently not easy to return the causes of food borne diseases and associated mortalities to a definite foodstuff (4).

The health instructions for the restaurants and hotels workers are insufficient to cover all items for proper handling of foods and the essential quarantine measures to avoid food born diseases. Food safety training packages and education via visual or printed media can improve the level of information and give the recommended experiences for food handlers which subsequently help in the broaden of the food safety practices. According to the experiences of both researchers and their colleagues, they suggested the needs for many studies concerning with food safety. The current work is predicted to add knowledges efficient to cover the needs of food safety which might aid for the public to get a healthy and safe food particularly in the low standard regions.

Aim of the work

The aims of the present work were to elevate the level of knowledge amongst companies' food stuffs on food safety, discover the knowledge of practice on food safety amongst them and to check the impact of knowledge booklet on food safety amongst companies' food handlers

Inclusion criteria

The inclusion criteria for sampling had been those people who are: working as stable group or employers in the companies and restaurants either working as waiters or chefs within the company or restaurants, agreed to contribute within the pretest, intervention and the posttest and accessible throughout the period of collection of data.

2. Materials and Methods

Research design for phase I: Descriptive survey and for phase II: One group pretest and posttest design. Survey was completed to establish those eating places with seating capacity greater than fifty having workers greater than fifteen. It was conducted amongst 268 group (cooks and waiters) who fulfilled the inclusion criteria from 20 chosen companies 'restaurants in Cairo, Egypt after acquiring the permissions from company owners of every selected restaurant and consent from each participant. 20 Companies' restaurants, 10 from them had been selected by way of simple random sampling method. The group working within the companies 'restaurants were regarded as a cohort group sample. All these employees with poor knowledge scores in phase I of

the study had been included (137) in phase II of the study. The time of the study was from June 2015 to January 2016.

For the development of the tools, a focus group discussion used to be conducted among the companies' food handlers to establish the subareas to be involved in the knowledge questionnaire and knowledge of practice questionnaire and information booklet on food safety. Validity and reliability knowledge of all the instruments were demonstrated and translated into Arabic language.

The demographic characteristics consisted of 9 items looking for data related to history data likeage, gender, education, situation of residing, number of years of experience in food handling, any physical defects, previous exposure to studies related to food safety, monthly income in L.E. and whether or not they have undergone any training program regarding food safety or no longer.

Questionnaire on knowledge on food safety consisted of 20 questions where it included the subareas like food poisoning, personal hygiene, food training, food service, food storage, food delivery and pest control. The knowledge score was categorized as good, average and poor. Questionnaire on knowledge of practice on food safety Questionnaire on knowledge of practice on food safety consisted of fifteen questions where it involved the subareas like food poisoning, individual hygiene, food preparation, food service, food storage, food delivery and pest control and food holding. The knowledge of practice scores used to be categorized as good, average and poor.

The booklet on food safety was titled as "What you need to know on food safety?" which frequently made out of subareas of food safety like individual hygiene, food preparation, foodservice, food storage, food delivery and pest control. The introduction on food safety was followed by the discussion of each and every of the above subareas. Each subarea also emphasized on the instructions that were to be followed at the same time working towards food safety.

The main study data collection was performed in two phases, from chosen companies 'restaurants. The phase I used was the survey where, the pretest used to be conducted among the food handlers of the 16 selected restaurants. Data used were gathered from 268companies 'restaurant employees by using structured questionnaire on food safety for assessing the knowledge and practice. Analysis of phase I was completed and after that those who had poor knowledge had been included into phase II of the study knowledge of. The phase II started out with the administration of the booklet, on the eighth day of the administration of booklet, a posttest was performed for each sample.

3. Results

The results of the present study were statistically analyzed by using special software of Statistical Package for Social Science (SPSS) version 16. The total samples subjected for analysis were equal 268 companies' food handlers in phase I and 137 food handlers in phase II of the investigation. The rate and percent were computed for recounting the sample characteristics. As illustrated in table (1) most of representative subjects (73.2%) their ages ranged from 22 to 40 years old, where 95.4% of participating subjects were adult males. In the same time, 39 % of

individuals had primary education fro primary schools and 0.9% only of the subjects carrying the postgraduate certificates. With respect to living area, 92.8% were living in rural areas and non-of them complaining from anomalies or physical disorders. 42.2 % of participants had an experience less than 5 years in food handling, whereas, the monthly salary exceeds 5000L.E. Merely 0.5% of the participating subjects had former training program about sources of infection and ideal methods for preservation of food, and only 0.7% of studied samples had joined in a training program on food safety before.

Table 1: Frequency and percentage distribution of food handlers in their demographic characteristics

Characteristics	frequency	Percentage (%)
Age I years group		
< 21	29	10.7
22-40	196	73.2
41-60	43	16.1
> 60	0	0.0
Gender		
Male	256	95.4
Female	12	4.6
Education		
Primary school	107	39.8
Secondary school	41	15.4
PUC	84	31.2
Diploma	10	3.8
Graduate	24	9.0
Postgraduate	2	0.8
Place of living		
Rural	249	92.8
Urban	19	7.2
Number of years of experience in food handling		
≤5	113	42.2
6-11	103	38.5
11-15	42	15.5
≥16	10	3.8
physical defects		
No	268	100
Yes	0	0.0
Previous exposure to related studies		
No	266	99.1
Yes	2	0.9
Monthly income		
≤1500	7	2.6
1501-3000	38	14.1
3001-5000	95	35.4
≥5000	128	47.9
Attended training program		
Contamination & preservation of food	1	0.5
Food Safety	2	0.7
No training at all	265	98.8

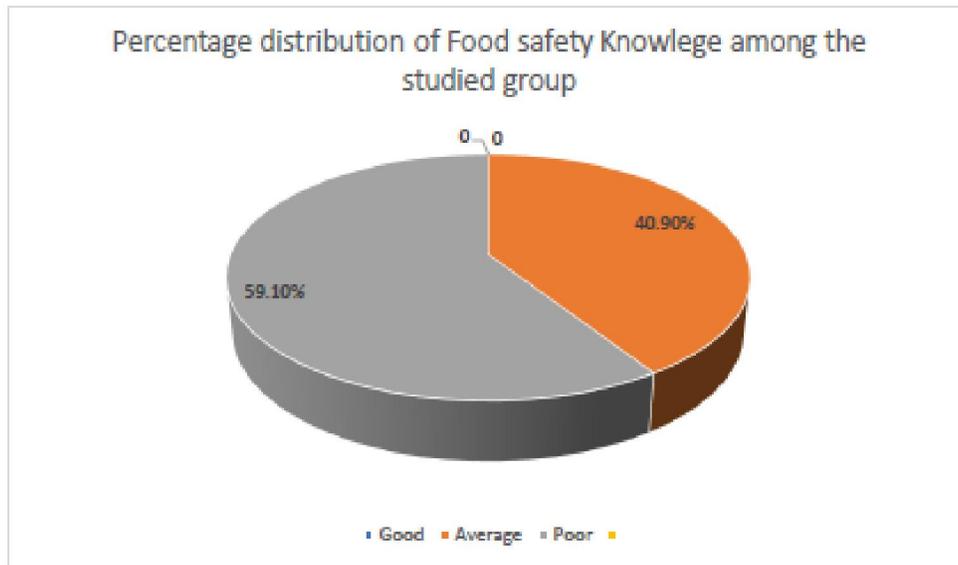


Figure 1: Percentage distribution of knowledge on food safety

Regarding to knowledge on food safety amongst food handlers, it was found that most of the participants (59.1%) had poor knowledge on food safety, 44.9% had medium level of knowledge on food safety and not found and of the participants had good knowledge on food safety. (Figure 1)

As regards Knowledge on practice of food safety among food handlers it was indicated that the most of representative subjects (52.2%) had common knowledge on food safety, 40.1% had poor knowledge of experience on food safety and 7.7% had good level of knowledge of follow the instructions on food safety (Figure 2).

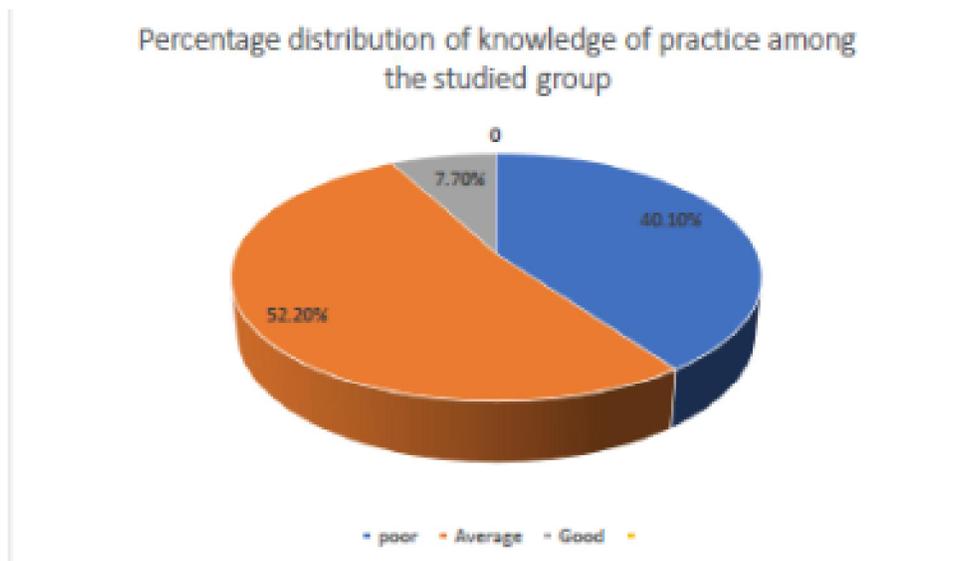


Figure 2: Frequency and percentage distribution of knowledge of practice on food safety

On studying the correlation between the knowledge and experiences for food safety, the results acquired had been statistically estimated by using Karl Pearson Correlation Coefficient. The r value

confirmed a vulnerable constructive correlation between knowledge and experiences on food safety (Table 2).

Table 2: Correlation between mean score of knowledge and knowledge of practice on food safety

Variables	Mean	SD	R value	P value
Knowledge on food safety	7.24	2.42	0.390	0.001*
Knowledge on practice of food safety	6.32	3.08		

*Correlation is significant at 0.01 level

It was found that the knowledge booklet was very efficient in increasing the knowledge level of companies' food handlers within the regions of personal hygiene, food storage and food preparation

and it was not useful to advance the knowledge of food handlers in the regions of food poisoning, food delivery and insect control (Table 3).

Table 3: Mean pretest, mean posttest and t value on knowledge on food safety among food handlers

Knowledge on food safety	Mean	SD	Standard error	t value *	df	P value
Pretest	5.58	1.454	1.186	27.247	137	0.001*
Posttest	10.66	1.73				

*Paired „t“ test, Significance at 0.05 level

Table 4 shows that the information booklet was effective to improve the knowledge of food handlers within the areas of personal hygiene, food preparation,

food delivery and food storage and it was not effective to improve the knowledge of food handlers within the areas of food poisoning and pest control.

Table 4: Area wise mean pretest, mean posttest and t value on knowledge on food safety among food handlers

Area	Knowledge range of scores	Pretest			Posttest			t value	P value
		Mean	Mean %	SD	Mean	Mean %	SD		
Food poisoning	0-4	1.28	30.26	0.95	1.12	28	0.58	1.67	0.097
Personal hygiene	0-5	0.97	19.3	0.60	2.12	42.4	0.93	12.69	0.001*
Food preparation	0-3	2.04	69	0.96	2.51	83.7	0.64	4.67	0.001*
Food storage	0-6	1.97	32.4	1.12	4.10	68.34	1.07	17.08	0.001*
Food delivery	0-1	0.41	41	0.49	0.33	33	0.47	1.97	0.052*
Pest control	0-1	0.56	56	0.50	0.58	59	0.48	0.25	0.801

*Significant Difference

Table 5 shows that The information booklet was effective to improve the knowledge of practice of food handlers within the areas of food storage, food delivery and food holding but it was not effective in

improving the knowledge of practice of food handlers within the areas of food poisoning, individual hygiene, food preparation and pest control.

Table 5: Mean pretest, mean posttest and t value on knowledge of practice on food safety among food handlers

Knowledge of practice on food safety	Mean	SD	Standard error	t value	df	P value
Pretest	5.73	3.47	0.30	10.52	1.38	0.001*
Posttest	8.88	2.07				

*Paired „t“ test, Significance at 0.05 level

Table 6 shows that, the information booklet was effective to improve the knowledge of practice of food handlers within the areas of food storage, food delivery, food guidance and food conserving. For areas of food poisoning, individual hygiene and pest control and it was once now not effective to improve the knowledge of practice of food handlers.

The present study showed that there's significant association between knowledge on food safety and the

selected sample characteristics like age in years, education, number of years of experience in food handling and monthly income in Egyptian pounds. In addition, there is significant association between knowledge of practice on food safety and the selected sample characteristics like age in years, education, number of years of experience in food handling and place of living.

Table 6: Area wise mean pretest, mean posttest and t value on knowledge of practice on food safety among food handlers

Area	Knowledge of practice range of scores	Pretest			Posttest			t value	P value
		Mean	Mean%	SD	Mean	Mean%	SD		
Food poisoning	0-2	0.74	36.6	0.69	0.81	40	0.63	0.17	0.863
Personal hygiene	0-3	1.47	49	0.87	1.60	53.33	0.82	0.76	0.455
Food preparation	0-4	1.86	48	1.07	2.27	56.5	0.92	1.96	0.052*
Food storage	0-3	1.15	38.34	0.87	2.12	70.33	0.67	9.97	0.001*
Food delivery	0-1	0.52	51	0.51	0.80	80	0.40	3.93	0.001*
Pest control	0-1	0.28	28	0.45	0.29	28	0.46	0.40	0.693
Food holding	0-1	0.34	34	0.47	0.86	86	0.35	10.17	0.001*

*S= Significant Difference

4. Discussion

The current work indicated that generally, non-of the employers have possessing a good knowledge on food safety and the whole samples represent common and poor knowledge. Practically, 52.2% of them had average or common of knowledge of handling of foods by safety ways. Whereas, 40.1% had poor knowledge of practice on food safety and 7.7% had good knowledge of training on food safety. This was in agreement with the work performed by way of Isara and Isah, who determined that greater than 1/2 (52.6%) of the group had poor knowledge in food hygiene and safety and it as well stated that the incidence of food pollution in fast meals restaurants was reached 37.5% (6). The obtained results are parallel to that of Declan Bolton, who suggested that lots of the food toxicity in restaurants occurred as a result of deficiency in the knowledge among food handlers concerning safety manipulation and hygiene measures (7).

Additionally the present data printed a significant linkage between the knowledge and the knowledge of training on food safety within the participants in the study of food handlers. A comparable study in Taiwan supporting similar results was performed by Wen-HwaKo included the food handlers, which indicated that 84.7% having average knowledge in food safety knowledge and practice with a base on Hazard evaluation and critical control point practices and it additionally practiced a constructive relation amongst knowledge, average, and HACCP practices (8).

The data in addition, pointed that knowledge booklet was potent in increasing the status of knowledge on food safety. This approach was parallel to the investigation which carried out in Korea by Sung, Tong-Kyung and Chang on food handlers, they reported a raise of knowledge for the food handlers from 49.3% to 66.6% after two weeks of subjecting to training program on food safety (9). In Egypt another study was performed by Ahmed, *et al.* on sample of the food handlers of Al Mansoura restaurants, they

showed that there was a progress in accepting the required knowledge concerning handling foods by hygienic manners after taking a condensed course for 3 months on intervention program using visual and printed media. This reflected on the practice of manipulating or handling foods by safety ways which jumped from 23.5 to 65.4% (10).

Conclusion

Although several influences affect the knowledge and knowledge on practice of food safety, this study helps to conclude that a printed media; information booklets an effective process to raise the knowledge and knowledge of practice on food safety between the companies' restaurant workers. It additionally exhibits that if the knowledge on food safety is corrected, then the practice of food handlers will be raise and this will reflect in reducing of food borne illnesses from eating places and other public restaurants.

Ethical consideration

Before starting of the study, ethical approvals was obtained from the top managements of all companies involved in this study and from health & safety Officers, particular officer of food safety department

Limitations of the study

Owing to the realistic difficulties, cohort sample was applied for deciding upon the food handlers from the chosen companies 'restaurants, which restricts the generalization of the work data obtained. In addition, the investigation was performed with single group which limits the generalize knowledge of the result.

Recommendations

According to the finding we can recommends duplicating similar study on a bigger sample with knowledge sampling technique which can support to depict conclusions that can be generalized. A similar study knowledge of with an experimental and control

group will also be performed which gives extra generalize knowledge for the outcome. A training program on food safety can also be performed for the food handlers prior to work in the restaurants to raise the effectiveness.

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