



Finding the Missing Pieces of Food Safety Training Puzzle on Nile Cruises: a Delphi Approach

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ABSTRACT

The Nile cruises operating between Luxor and Aswan are major contributors to tourism and hospitality in Egypt. Research has found that one of the vital challenges is the absence/ lack of effective management of food safety since some food poisoning incidences on Nile cruises were reported. However, there is no in-depth evidence on food safety training features on Nile cruises. This study aims to determine the consensus among a sample of experts on the main features of food safety training on the Nile cruises. A panel of 30 experts participated in a modified, three-round Delphi technique (DT) for conducting this study. The panel included academics, food safety trainers, Nile cruises managers, food safety auditors, and tourism and health ministries experts. The findings exposed that ineffective training needs analysis, evaluation, and vague legal requirements are the most important feature of food safety training on Nile cruises. The findings of this study may be useful for cruisers management, food safety trainers and auditors, as well as policymakers for future effective food safety training.

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1. Introduction

Foodborne diseases (FBD) are general health-related issues, with an estimated more than 600 million persons falling sick each year (WHO, 2019). In the case of developing countries, particularly the Middle East and North Africa (MENA) region has the third premier estimated burden of FBD per population (Todd, 2017). WHO (2015) estimated that 100 million persons living in the MENA region fall sick with an FBD illness yearly, and 32 million of those affected are children below five years. Additionally, around 70% of the burdens of FBD in this region are due to *Escherichia coli* (*E. coli*), *norovirus*, *Campylobacter*, and *Nontyphoidal Salmonella* (Todd, 2016).

Consequently, some developing countries, including Egypt, established national food control systems. The Egyptian Parliament launched the National Food Safety Authority (NFSA) by Law 1/2017 (NFSA, 2020). However, many previous studies have found that food poisoning and foodborne illness is still severe health issue in Egypt. An example from a non-tourist province, the *Staph Aureus* outbreak, occurred on the 24th of July 2018 after having a meal in five stars hotel in Zagazig city in El-Sharkia province. The findings of the outbreak revealed that 17.1% (163/954) of guests had signs and symptoms of food poisoning. Out of 163 with 98 (60%) of them were hospitalised, and two cases died, giving CPR 0.6% (Magdy et al., 2018). In addition, the observation exposed that

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improper food-holding temperatures and poor staff personal hygiene during preparing and handling food. On the other side in the hotels' sector, there is much evidence that food poisoning occurred due to malpractices of food handlers. Unfortunately, such incidences influence the tourism and hospitality industry negatively. The top Egyptian tourist destination (Hurghada) was ranked on the top of the "worst" destinations in terms of illnesses (2017-2018) with 380 cases. Tragically, In August 2018, a couple died at Steigenberger Aqua Magic Hotel (a five-star hotel) in Hurghada. The Post-mortem tests showed *E. coli* bacteria was a factor in both deaths. In particular, it was also found that those resorts are accounted for 95% of food illness claims in Egyptian resorts (Arabian Business, 2019). Another outbreak had occurred in Alexandria since four persons were hospitalised after consuming spoiled *Fesikh* (fermented mullet fish). This increased the total reported cases of food poisoning due to consuming spoiled *Fesikh* in Alexandria to 70 patients, including one fatality (Osama, 2019; Khalife, 2019).

Many food safety-related incidents occurred last few years on Nile cruises. Specifically and for instance, in 2018, three food-poisoning incidents occurred in a week in the floating hotels in Luxor and Aswan. A hundred and twenty-five persons were involved in those incidents, which led to a huge drop in tourism and the close of the floating hotels in the governorates of Luxor and Aswan. Meanwhile, the General Administration of Food Control launched a campaign against 28 floating hotels in Luxor Governorate. The campaign resulted in the issuance of 92 reports regarding food safety violations, which were sent to the competent prosecution, which is conducting investigations. In addition, it was reported that 278.5 kg of food and 69.5 liters of drinks and juices were spoiled, and unfit for human consumption were destroyed. Unfortunately, the causes of such incidents were mainly lack of hygienic/clean potable water, malpractices of food handlers, and unclean kitchens and worktops onboard the ships. Obviously, the investigation of the incidents underlined the ineffective food safety training as well as the inconsistency of training requirements among related entities, including the General Administration of Food Control and the Ministry of health (Elhawary, 2018). To minimise FBD incidents, food handlers must be trained/instructed effectively on food safety and hygiene. Food safety training is a fundamental element of every foodservice business for ensuring food safety and in applying food safety management systems, i.e.,

HACCP and ISO 22000. It is also a legal requirement that all food handlers have been trained and/or supervised commensurate with their job activities. Every public or private food business is responsible for training all employees whether they are full-time, part-time, or casual (Nguyen-Viet et al., 2017). Previous research has underlined that adequate food safety training of all food handlers may have a positive effect on the scores of the health inspection and improve some food safety behaviours, such as hand hygiene (Bryan, 2002). Additionally, food safety training is important for preventing/minimizing FBD (Seaman and Eves, 2010; Wolfe et al., 2010). The training features should be considered and be dependable on the characteristics of the food handling and roles of food handlers (Abdelhakim, 2016).

However, to date and according to the best of our knowledge, there is no in-depth study on food safety training on Nile cruises based on the experts' opinion on the required effective features of food safety training. Thus, this study aims to judge the features of the current food safety training on Nile cruises using a modified Delphi technique. The findings of this study may help in deciding the priorities of this sector, particularly after launching the National Food Safety Agency of Egypt (NFSA) in 2017

2. Literature Review

3.1. Importance of food safety training

Food safety training is one of the keys to effective food safety systems implementation. In addition, it must be considered at different stages of employment to produce safer food as well as it must be developed to meet new challenges and requirements. This means to train newly hired before starting work, then after a year and so on (Springer, 2009). It was also found that effective training of food handlers assists in the production of safe food, maintaining the product quality and decreasing waste, and complying with legal requirements.

Adikari et al. (2016) stated that food handlers' knowledge should be improved by training programs about food safety and hygiene to provide safe food. According to Adam (2018), food handlers on Nile Cruisers were found to have a positive attitude towards food safety systems, but they had a low level of food safety knowledge, ineffective training. Such training is essential for combating these food safety risks is through food safety training (Cotterchio et al., 1998). However, although food safety training significantly improved food handlers' knowledge, it did not positively impact food handling related practices or

behaviours (Seaman and Eves, 2006). Besides, although certification helps managers to a better understanding of food safety practices, it does not mean that food handlers will transfer gained knowledge from training to the workplace (Duffy, 2008).

2.2. Regulation requirements for food safety training
Legalizations requirement is the main power/enforcement for the implementation of food safety training among food businesses. In sequence, most if not all countries around the world have their legislation requirements of food hygiene training. In Ireland, for instance, the law specified that “*food handlers are supervised and instructed or trained in food hygiene matters commensurate with their activity*” managers and supervisors must ensure that this requirement is met (Food Safety Authority of Ireland, 2006).

Another example, in the European Union Regulation (EC) No 852/2004 in Annex II (General Hygiene Requirements), in Chapter XII (Training) stated that food business operators are to ensure firstly, “*Food handlers are supervised and instructed and/or trained in food hygiene matters commensurate with their work activity*” and secondly that “*Those responsible for the development and maintenance of the HACCP system or for the operation of relevant guides, have received adequate training themselves in the application of the HACCP principles*”.

In Egypt, despite the establishment of the National Food Safety Authority (NFSA) by virtue of the new Law 1/2017 (NFSA, 2019) as the national food control system, there are no general legalisations that require all food handlers to be trained/instructed on food safety. However, with time, it is expected that the FSA will issue such legalisations in the near future.

2.3 Timing of Training

According to the requirements of the legislation, all food handlers must be trained/instructed on food safety and hygiene in relation to their job tasks. The stages of food safety training are different based on the legal requirements, the organization requirements and food handlers' experience, and work duties.

For instance, in Ireland and UK, the “Industry Guide” (JHIC, 1997) planned various stages (1, 2, &3) of food safety training based on three categories of food handlers; A, B, and C in the catering industry. Firstly, stage (1), which normally takes place before the job and it ideally, can be included in the induction training programs. In this stage, topics, including personal hygiene and kitchen sanitation, are covered for any new food handlers in categories A, B, or C. It is

recommended that this stage of training does range between half and one hour because further training will go later.

Second (Stage 2) develops further food safety awareness. It should be provided within the first few weeks of starting work for full-time staff and may be extended to eight weeks for part-time staff (JHIC, 1997). In this stage, the basic principles of food hygiene should be covered in relation to the business and the duties of employees. This level of training should take about three hours and cover many topics. Finally (Stage 3) considers food handlers with high-risk duties (Categories B and C) who require training further than informal training (Stage 2) to comply with legislation, while this need not lead to a qualification (JHIC). This stage is highly developed compared to the previous stages as it includes training food safety management systems such as the HACCP system.

In Egypt, although there is not much evidence on the required levels of food safety training that food handlers should obtain, some catering business may train their full-time staff on advanced levels of food safely provided by several accredited examination organizations, including Highfield Qualifications.

2.4 Training sources (Internal vs. External)

In general, training may be delivered by in-house trainers/instructors or by external or outsourced trainers/instructors. Deciding to depend on internal or external or both sources of food safety training is subject to many factors, including nature of process/food service, required available facilities for training delivery, the type of training: practical or theoretical or on-job or off-job training, the number of trainees, the management role in training, the available budget for training, and the legal requirement (e.g., Abdelhakim, 2016; Ajlouni, & Gaungoo, 2018). Either in-house or external, food safety training should be delivered based on TNA and food handlers' roles. In addition, trainers need to be qualified and have the required knowledge with the competencies which must be achieved, have practical skills in the subject, and be experienced in training and presentation (Gruenfeldova et al., 2019). Furthermore, food safety training may be formal or informal, and it may be delivered to groups or on an individual basis according to the needs of the food business (Seaman& Eves, 2006).

2.5. Training levels and staff roles

Food safety training themes/contents/ levels should be comprehensive and meet the level of food handlers (Abelkaim et al., 2018). For example, the basic level

should be delivered to professionals such as assistant chefs and waiters, intermediates for supervisors, and the advanced level should be delivered to managers. While the topics are the same at all levels, the training outcomes are different according to the target group of food handlers (Abelkaim et al., 2018). The main food safety issues that should be covered during training include foodborne illness, food safety legislation and enforcement, food hygiene, food safety hazards, food handlers, and personal hygiene, the design and layout of food premises and equipment, cleaning and disinfection, HACCP, ISO 22000, pest management, food receiving, storing, preparing, and serving, food safety training and education (e.g., Ajlouni, & Gaungoo, 2018; Sprenger, 2009).

2.6. Training evaluation and effectiveness

Training evaluation is a continuous process. It starts with the TNA stage and goes in conjunction with all stages of the training cycle until after training delivery. This means that training evaluation is conducted before, during, and after training. The main purpose of training evaluation is to determine the effectiveness of training programmes (Kirkpatrick and Kirkpatrick, 2006) as well as to help the organizations choose, monitor, evaluate different training courses (Seaman, 2010). Training evaluation helps in evaluating the financial investment in training (Kirkpatrick and Kirkpatrick, 2006).

According to the Kirkpatrick model, the training evaluation should be according to four levels (reactions, learning, behaviour, and results) that reflect the hierarchy of stages of evaluating training programmes (Kirkpatrick and Kirkpatrick, 2006). Training evaluation allows trainees and managers/supervisors to identify the productivity resulting after training (Wallace, 2014). However, in the case of food safety training, most evaluations are knowledge (learning) based (Abdelhakim, 2018), and consequently, most of the food safety cognition of food handlers focused on knowledge, attitudes, and reported practices model (Rennie, 1994). On the other hand, the results of training are rarely evaluated on the organisational level (Seaman, 2010). Thus, most training evaluation is ineffective and requires improvement.

2.7 Training recurrence/refreshing

Refresher training or retraining is fundamental for maintaining and improving the food safety behaviours of food handlers. Food safety training should not be a one-time occurrence. Training recurrence gives food handlers repeated exposure and more opportunities to

bring up to date, review, and perfect learned skills (Soon et al., 2012; McFarland et al., 2019). Food safety training should be recurrent annually at the minimum and based on the risk of handling food. The refresher training should focus on the hot issues in handling food, including hand washing and temperature control along the food supply chain. It is also desirable that food handling behaviours are observed after refresher training and food handlers be awarded recertification (Soon et al., 2012).

2.8. Barriers to effective food safety training

The previous research had identified many barriers to effective food safety training, including the socio-cultural characteristic barriers of the food handlers such as the low educational level and languages (Seaman and Eves, 2006). Additionally, the ineffective legal requirements (obligation) attending food safety training, such as in the case of Egypt, where NEFSA was recently launched in 2017 (NEFSA, 2020). Moreover, the availability of financial sources affects the type/model of training, as well as the size of the catering establishment and its effect on the type and quality of training programmes. Furthermore, time availability, management and peers attitude, formal or informal delivery of food safety training courses, and external or internal providers may all affect the level of choice and effectiveness of a training programmes (Worsfold et al., 2004; Abdelhakim 2016; Fox, 2020). Besides that, Abdelhakim et al. (2018) and Abdelhakim et al. (2019) underlined that the absence or ineffective training needs assessment (TNA) and evaluation play as barriers to effective food safety training.

3. Methodology

3.1. The study context

According to the Egyptian hotels Guide (2010), there are 264 Nile Cruises of different categories: five-stars (n=189); four-stars (n= 46); three-stars (n=24); two-star (n=3); and unclassified/ categorized (n=2). These Nile cruises are mainly owned and managed by four companies, Travco Nile cruises, Spring tour, Nile exploration, and Seti first. There is disparity among these companies regarding the number and classification of the owned cruisers. For instance, while Travco Nile cruises owned 14 five-stars and two four-stars, Seti was first company-owned and managed two five-stars and five three-stars.

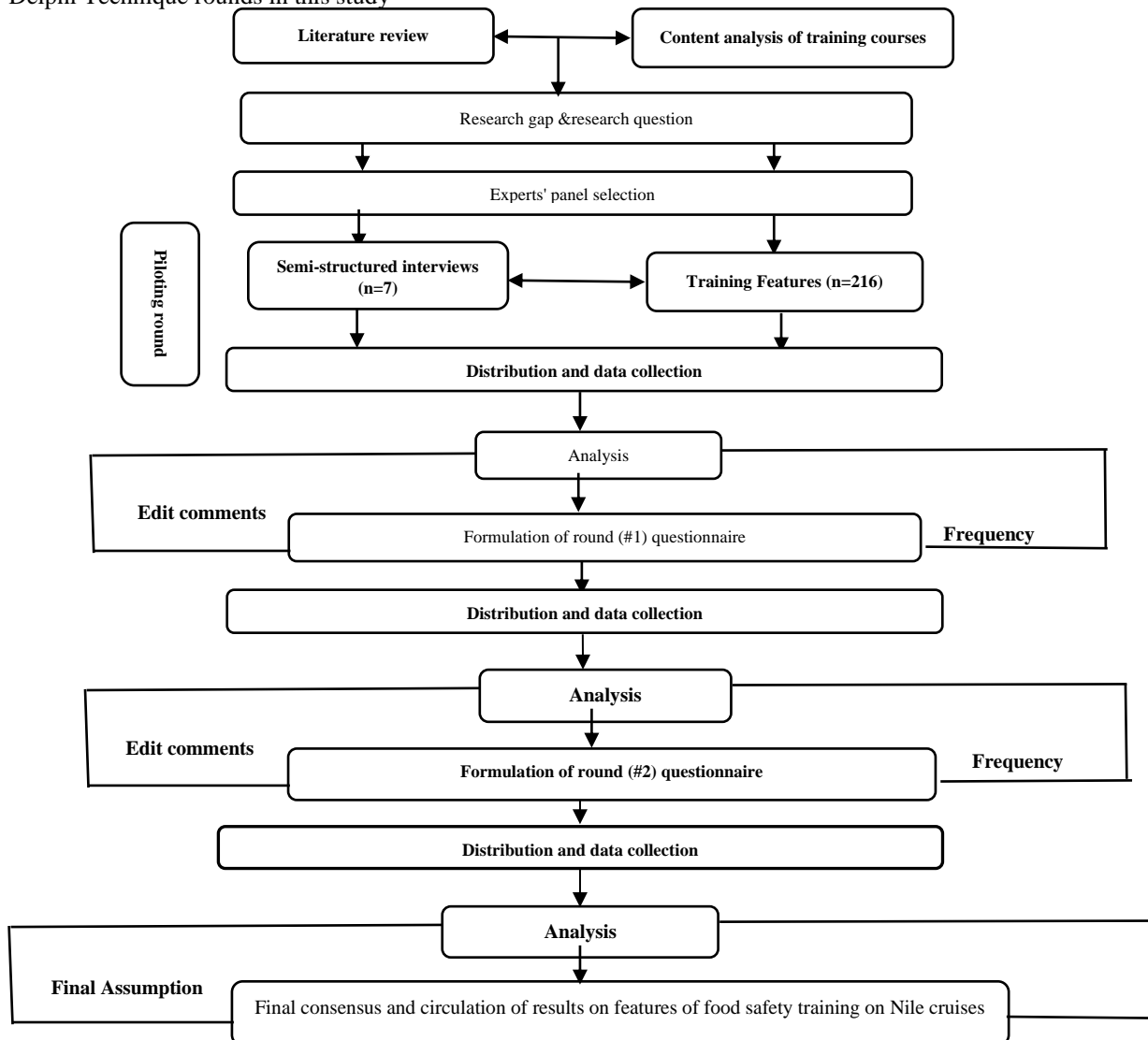
3.2. Delphi technique

The root of DT (DT) is referenced to the Ancient Greek god Apollo, whose Delphi oracle was seen as his most expert, truthful, and reliable informant (Delbecq et al., 1975). The DT is a research method that is "designed to obtain the consensus of opinions of a group of experts (via) a series of intensive questionnaires interspersed with controlled opinion feedback" (Dalkey & Helmer, 1963:458). The DT is also known as the "expert judgment approach". This method is based on the opinion of a group of experts in the field of the study, so that indirect discussion takes place, meaning that each member of the experts' panel shows an excellent away from the influence of the group's opinion (Delbecq et al., 1975).

The DT is one of the methods for data collection and analysis in different research designs: qualitative, quantitative and mixed methods. DT has been used in Figure 1:

different disciplines, including tourism and hospitality (e.g., Jones et al., 2013; Gil-Lafuente et al., 2014; Fefer et al., 2016; Sobaih et al., 2012; Paraskevas, 2012). Additionally, many studies on food safety and food safety training were Delphic in approach (Johnston et al., 2014; Kim et al., 2013). For conducting this study, a modified two-round DT was used. The DT was modified by eliminating the first-round questionnaire (Murry & Hammons, 1995) and replaced by a semi-structured interview with a panel of experts (n=7) as well as content analysis of the current food safety training courses. The answers of the first round (#1) were used to develop the questionnaire for the second round (#2) to get hold of the panel perspectives on the features for effective food safety training on cruises (Figure 1).

Delphi Technique rounds in this study



3.3. Delphi panel selection

A purposive sample was used to employ the panel of experts for this study. All the targeted panelists were working in Luxor and were related to food safety issues on cruises. They were hired as representatives from the most related entities: Tourism Ministry (TM), Egyptian Tourism Federation (ETF), cruisers manager, Luxor-Health office, Luxor-Veterinary office, and Food safety Auditors and third parties (e.g., crystal - SGS). Obtaining responses from different backgrounds of experts served to diversify the perspectives. For obtaining high reliable results, Dalkey (1969) recommended that if the Delphi approach is used with more than 13 subjects, the level of reliability will exceed 0.80. In the same vein, Delbecq et al. (1975) suggest that 10–15 subjects are sufficient if their background is homogeneous. Thus,

based on criteria suggested by Keeney et al. (2011), this study selected 30-panel experts categorised for three sub-groups: 1) Food safety auditors and/or third parties (e.g. URS; SGS; TUV) (n=9); 2) Cruisers managers (e.g., F&B managers, executive chefs, quality manager and/or supervisors) (n=15); and 3) formal bodies and entities (e.g., Health office; Luxor-Veterinary office; Luxor-Tourism office) (n=6). The experts were nominated based on their work experience in relation to food safety and cruises.

4. Research Findings

4.1. Interview and Beta test results

The interview results revealed that there is a variation in features of current food safety training provided for cruises employees. Table 1 summaries the common and generic features according to the interview.

Table 1

The general features of food safety training on Nile cruises

Features	Evidence/s
Availability of training	<i>Mainly there is generic food safety training for cruises staff.</i>
Legal requirement	<i>There is a general requirement but not a specific legal requirement for food safety training.</i>
Rate of recurrence	<i>Infrequently, that was done, and it is not periodic and not constant.</i>
Source of training (in-house/outsourcing)	<i>Mainly outsource training by food safety auditors, Egyptian Tourism federation.</i>
Training needs analysis (TNA)	<i>1. Most of the training courses are the same for all roles of employees. 2. In a few cruises, there are two levels of food safety training (basic) for all professional food handlers and (HACCP) for supervisors.</i>
Main contents	<i>Food Safety in general; how to prepare safe food, the causes of food contamination, the causes of food poisoning, the human factor and the movement of food and foodstuffs and the surrounding environment, hygiene, disinfection, attention to places of food circulation, and good reception of foodstuffs, HACCP system, food receiving, storing, personal hygiene, food hygiene, implementation food safety programs, food allergy, food poisoning, the safety of equipment and tools, the safety of refrigerators, good ventilation, cleaning, production, and expiration date.</i>
Type training	<i>1. Mainly theoretical training 2. Sometimes, use case study training strategy</i>
Barriers to effective food safety training	<i>1. Lack of time for time. 2. The weak training content and delivery. 3. Lack of employees' interest and attention. 4. The management attitudes towards food safety training. 5. Absence of qualified training and effective methods of devilry.</i>
Evaluation	<i>1. The evaluation is done by reporting the training process. 2. Theoretical and practical examinations 3. By counting the food safety-related incidences/ food poisoning/ occurring of food-related illness cases. 4. Using a checklist for observation of the staff while handling food.</i>
Training delivery mood	<i>Most training programmes are delivered based on "classroom" with PPT slides.</i>

The first aspect of food safety training on Nile cruises was the availability of such specific training. The findings exposed that most of the experts (5/7) reported that they provided and/or received food safety

training. For instance, (expert 4) mentioned that "Of course, there are training courses offered by the ministry of tourism to the quality controllers and inspectors the food monitor before they are hired".

The nature of training was also highlighted as (expert 4) underlined that the training is “It is only a theoretical but not practical training”.

The provided training was provided by both public entities, including the "ministry of tourism and ministry of Health" (experts 3, 5, 5), and private organisations such as: "Crystal and SGS "(experts 3, 5). Additionally, after some food poisoning outbreaks have taken place in some resorts in Sharm El-Sheikh, the Ministry of tourism reconsidered the food safety training for all food handlers in the foodservice sector; this was explained by experts 3&5” Yeah. The training is carried out within the Ministry's programs for training. Currently, there is a study for the preparation of various exercises by the Minister's advisors for training". On the other side, nearly the third of respondents (n=2) exposed that there is no food safety training on Nile cruises, and this is clear by experts 6&7 “This is supposed to provide periodic programs to clarify healthy methods of food hygiene

and safety”. Based on the interview results, the DT findings are presented in the following sections.

4.2 Profile of Delphi panel

After piloting 23, out 30 experts completed the two rounds of DT. Table 2 presents the demographic profile of the panelists. It is obvious that most majority of them were males (91.3%; n=21), and the minority were females (8.7%; n=2). The experts were distributed among the age categories, most of them (65.3%) aged between 36 and 45 years, and 30.4% are aged between 46 and 55 years. Concerning their education level, most of them hold a bachelor's degree (73.9%), 17.4%, and only 8.7 hold master's and Ph.D. degrees, respectively. Most panelists (52.2%) had more than ten years of work experience, e.g., food safety auditor, trainer (13%). Also, more than half of them (60.9%) reported that they had attended three times or more food safety training programs, and 82.6% of them reported that the training was certified

Table 2

Demographic profile of panelists

Item		Number (n =23)	%
Gender	Male	21	91.3
	Female	2	8.7
Age	30-35	1	4.3
	36-45	15	65.3
	46-55	7	30.4
Education	BSC degree	17	73.9
	MSC degree	4	17.4
	PhD	2	8.7
Work experience	1 -5 years	3	13
	6-10years	4	17.4
	10-15 years	12	52.2
	<15 years	4	17.4
Sector	Governmental entities (e.g., Ministry of tourism, Veterinary office).	3	13
	Food safety auditing- certification and training	5	21.7
	Cruises managers and supervisors	15	65.3
Food safety training program	1 time	2	8.7
	2 times	7	30.4
	More than 3 times	14	60.9
Training certification	Certified food safety training, e.g., Highfield	19	82.6
	Not certified	4	17.4

4.3. Important objectives of food safety training

Table 3 shows the main objectives of food safety training among the panelists. It is obvious that the top five objectives of food safety training were cross-contamination, food poisoning and foodborne illness

Table 3

Objectives of food safety training

(M=1.67); personal hygiene (hand hygiene and protective uniform) (M=2); food safety legislation/requirements (M=4.47); cleaning, disinfection, and sterilisation of equipment and tools (M=6.13); and Cross-contact and food allergies (6.60).

Training objectives	Ranking	Mean
Cross-contamination, food poisoning, and foodborne illness	1	1.67
Personal hygiene (hand hygiene and protective uniform).	2	2.00
Food safety legislation/requirements.	3	4.47
Cleaning, disinfection, and sterilisation of equipment and tools	4	6.13
Cross-contact and food allergies	5	6.60
Sanitation of the facilities	6	7.27
Best practices for receiving	7	8.93
The stream of food: storage	8	10.0
Pest management	9	11.0
Food preparation	10	12.07
The stream of food: service	11	12.66
Food safety management systems (HACCP, ISO22000)	12	12.66
Building a employees' food safety culture	13	12.66

On the other hand, the lowest three-five objectives of food safety training were the stream of food service, food safety management systems (HACCP, ISO22000) and building an employees' food safety culture. These findings are inconsistent with previous research (e.g., Ajlouni, & Gaungoo, 2018; Sprenger, 2009; Seaman & Eves, 2006) mentioned that the main food safety issues that should be covered during training include foodborne illness, food safety legislation and enforcement, food hygiene, food safety hazards, food handlers and personal hygiene, the design and layout of food premises and equipment, cleaning and disinfection, HACCP, ISO 22000, pest management, food receiving, storing, preparing and serving.

4.3. Legal requirements of food safety training

Table 4

Authorities of legal requirements of food safety training on Nile cruises

Legal requirements of food safety training	Ranking	Mean
Tourism Ministry, authority requirements- Health Center	1	5.20
External – third-party auditors (e.g., SGS, URS, Crystal)	2	4.47
Health Ministry requirements	3	2.00
Veterinary office	4	4.47

Most if not all countries around the world have their legislation requirements of food hygiene training. The findings showed that the experts consented that the current food safety training in Egypt is due to the main legal requirements of the Tourism Ministry, authority requirements (Health Center), third-party auditors (e.g., SGS, URS, Crystal), Health Ministry requirements, and Veterinary office. These entities are different in their requirements and enforcement of legal concerns of food safety and food safety training

(Table 4). This may be due to the absence of a national authority/ agency of food safety. However, recently the National Food Safety Authority (NFSA) established by virtue of the new Law 1/2017 (NFSA, 2019) as the national food control system. However, there are no general legalisations that require all food handlers to be trained/instructed on food safety.

4.4. Source of food safety training on Nile cruises

Tabulated findings revealed that the food safety training on Nile cruises is mainly delivered by external providers (e.g., food safety auditors/certification bodies). These certification bodies are contacted with Nile cruises for all food safety-related issues, including training. On the other hand, some Nile cruises provide training internally by their supervisors' trainers and managers.

Table 5:

Source of food safety training on Nile cruises

Source of food safety training	Ranking	Mean
External organisations (SGS-Crystal)	1	3.20
Internal – by supervisors and managers	2	4.47
Mixed by external and internal	3	4.80

Finally, a few cruisers depend on both external and internal food safety training as the last source of training on Nile cruises. These findings support the previous studies (e.g., Abdelhakim, 2016; Ajlouni & Gaungoo, 2018). These studies underlined that depending on internal or external or both sources of food safety training are subject to many factors, including nature of process/ food service, required available facilities for training delivery, the type of training, number of trainees, the management role in training, and the available budget for training. In addition, trainers need to be qualified and have the

required knowledge with the competencies which must be achieved, have practical skills in the subject, and be experienced in training and presentation (Gruenfeldova et al., 2019).

4.4 Food safety retraining on Nile cruises

Results in Table (6) indicate that the panelists agreed on three issues related to Food safety retraining on Nile cruises. Firstly, and on the top of the list, there is agreement that the recurrence of food safety training is infrequently/ rarely (M=1.2). Surprisingly enough that in the second order, they agreed that there is no food safety training recurrence or retaining of food handlers. Finally, on a few cruisers, panelists agreed that training refreshing is conducted annually and/ or according to timetables.

Table 6

Training recurrence/refreshing on Nile cruises

Recurrence of food safety training	Ranking	Mean
Infrequently/ rarely	1	1.20
Not recurrent at all	2	2.47
Annually, based on specific timetables.	3	3.20

These findings are in line with previous research (Soon et al., 2012; McFarland et al., 2019). Training

Table 7

The consensus of food safety training evaluation on Nile cruises

Main features of food safety training evaluation		Ranking	Mean
Who	By the internal trainers (Managers/ chefs/ supervisors) or external from third-party auditors, e.g. SGS.	1	1.67
	Representatives of Health/Tourism ministries	2	
How	Writing a general report about all trainees' reactions towards training programmes	1	2.00
	Theoretically, by exams/tests	2	3.00
	Number of reported food poisoning / foodborne illness	3	4.47
	Mentoring temperatures onboard after training.	4	7.27
	By evaluating customers' satisfaction and safety reports	5	
	Conducting unannounced food safety audits.	6	
When	During/Directly after training sessions.	1	5.20
	Continuously, at workplace onboard Nile cruises.	2	6.13
	At the end of each Nile voyage	3	6.60

Additionally, the delivery or undertaking of food safety training for employees on cruises may be generally evaluated or monitored by Health/Tourism ministries by examining the training records, observations, unannounced food safety audits, monitoring temperatures records, and others. However, most training evaluations are conducted during or directly after training delivery and mainly focus on the reactions and knowledge levels of trainees. These findings supported previous research on training evaluation since most evaluations of food

recurrence gives food handlers repeated exposure and more opportunities to bring up to date, review, and perfect learned skills. Therefore, food safety training should be recurrent periodically according to the cruisers' training policy.

4.5 Training evaluation

The consensus of food safety training evaluation on Nile cruises is illustrated in Table 7. Out of the 23 experts, 21 participated in the current evaluation of food safety training. The findings revealed that trainers/instructors who deliver food safety training are the main ones responsible for evaluating the training. Based on the source of training, the instructors/trainer may be internal (e.g., quality managers/chefs/supervisors) and/or external from third-party auditors, e.g. SGS. In general, the most methods used by instructors for evaluation courses are exams/tests for knowledge as well as questionnaires for assessing the reaction of trainees toward the training course methods, time, classes, etc. These findings are well cited in previous literature, for instance (Kirkpatrick, 2006).

safety training are knowledge (learning) based (Ho et al., 2016Abdelhakim, 2018), and consequently, most of the food safety cognition of food handlers focused on knowledge, attitudes, and reported practices model (Rennie, 1995, 1994). On the other hand, the results of training are rarely evaluated on the organisational level (Seaman, 2010). Thus, most training evaluation is ineffective and requires improvement.

4.6 The Barriers to effective food safety training

Out of the 23 experts, 18 participated on the perceived barriers to effective food safety training on Nile cruises, the agreement level of 18 panelists is tabulated (See table 8)

Barriers to effective food safety training on Nile cruises

Barriers to effective of food safety training	Ranking	Mean
Lack of understanding of the effective food safety training requirements.	1	5.20
Ineffective control and inspection of related officials' bodies (e.g., veterinary office, NEFSA, Tourism authorities) on water hygiene of the Nile as a source for water on cruises.	2	4.47
Employees' failure to seriously take the food safety issues during handling foods.	3	2.00
Lack of professional trainers	4	3.00
Lack of practical / on the job training	5	4.47
The absence of training need analysis for every role/level of employees	6	5.20
High costs with a lack of revenues during periods.	7	6.13
Time required for training as employees are taken from the line training	8	6.13
Generic and not specific food safety training	9	6.60
Low education levels of most food handlers working on board.	10	7.27

The findings of this study are in line with previous research that indicated that barriers to effective food safety training, including the socio-cultural characteristic barriers of the food handlers such as the low educational level and languages (Seaman and Eves, 2006). Additionally, the ineffective legal requirements (obligation) of obtaining and/or attending food safety training and or lack of legal enforcement, such as in the case of Egypt, where NEFSA was recently launched in 2017 (NEFSA, 2020). Moreover, the availability of financial sources affects the type/model of training, as well as the size of the catering establishment and its effect on the type and quality of training programmes. Furthermore, time availability, management and peers attitude, formal or

informal delivery of food safety training courses and external or internal providers may all affect the level of choice and effectiveness of a training programme (Worsfold et al., 2004; Abdelhakim 2016; Fox, 2020). Besides that, Abdelhakim et al. (2019) and Abdelhakim et al. (2018) underlined that the absence or ineffective training needs assessment (TNA) and evaluation play as barriers to effective food safety training.

4.7 The consensuses for effective future food safety training on Nile cruises

The consensuses of main procedures for effective food safety management on Nile cruises are ranked in table 9.

Consensuses for effective food safety training on Nile cruises

The Consensuses of Future effective food safety training	Ranking	Mean
Effective implantation of Training Need Analyses (TNA)	1	1.67
Develop training objectives for both individuals and cruises.	2	3.00
Design training courses based on the best practices and risk-based approaches. Conduct / deliver the training courses in both (on job & off-job-)	3	4.47
Increase the practical aspects of training using case studies and the analysis of reports of previous audits/ inspections	4	6.13
Conduct effective and continuous evaluation of training (before, during and after).	5	6.60
Update the training steps based on the previous courses as well as the legal requirements and incidents.	6	7.27

The tabulated consensuses are in agreement with the systematic approach of any training cycle, which basically aims to develop, deliver, and continuous improvement of a training program. It contains a systematic series of phases to help ensure that the food safety training on cruises is meeting and achieving the

planned objectives and intended outcome (Egan et al., 2007).

5. Conclusions, implications, and further research

This study aimed to identify the current food safety training features for Nile cruises in Upper Egypt. A

sample of 30 experts was used in a modified two-round DT. The findings exposed that Nile cruises managers and supervisors as well as experts from the governmental entities that the most important features of food safety training are the ineffective and vague legal requirements of food safety training among Nile cruises. Besides, this study demonstrated that the current food safety training is not effective since there many criteria and sources of training, which are different from each other. This led to variation in the feature of food they provided food safety training for Nile cruisers' staff. The study concluded with consensus for future effective food safety training on Nile cruises.

This study has significant implications for the Nile cruises and other hospitality establishments. First, it may be helpful for food safety trainers and auditors to place order effective food safety training. This is because of the lack of a comprehensive and risk-based food safety training material available in Egypt, specifically considering the Nile cruises. Also, all governmental entities (e.g., Tourism ministry) and private Food safety sectors (Food safety auditor) trainers should choose/develop food safety training courses that focus on current food safety NFSA requirements, the risk-based on /related to the current food handling practices, and specific behaviours that can help in reducing the potential risks of FBD.

Like other research, this study has some limitations that should be considered in future research. Firstly, using modified two-rounds, DT seems perfect for collecting data from panelists. It is still imperfect for giving an in-depth understanding of the features of food safety training. Thus using other qualitative methods such as a face-to-face interview individually or as focus groups with the same panelists after the Delphi sessions may be useful to stipulate the findings. Secondly, a quantitative study for assessing the food safety knowledge, attitudes, and behaviours of food handlers on board the Nile cruisers would be helpful in better understanding the features of the current food safety training. In addition, observing actual food-handling practices from the cruises during work would be helpful to develop and evaluate food safety training. Finally, this study targeted cruises in Upper Egypt (Luxor); other future studies may survey all cruises in the country.

References

- Abdelhakim, A. (2016). *Cabin crew food safety training: an exploratory study*, (PhD), School of Management, Cardiff Metropolitan University, UK.
- Abdelhakim, A. S., Jones, E., Redmond, E. C., Griffith, C. J. & Hewedi, M. (2018). Evaluating cabin crew food safety training using the Kirkpatrick model: an airlines' perspective. *British Food Journal*, 120(7), 1574-1589.
- Abdelhakim, A. S., Jones, E., Redmond, E., Hewedi, M., & Seaman, P. (2019). Cabin crew food safety training: A qualitative study. *Food Control*, 96, 151-157.
- Adam, S. (2018). Advantages and Challenges associated with the Implementation of Food Risk Assessment in Nile Cruisers, *International Journal of Tourism and Hospitality Management*, 1(1), 171-188.
- Adikari, A. M. N. T., Rizana, M. F., & Amarasekara, T. P. (2016). Food safety practices in a teaching hospital in Sri Lanka. *Procedia food science*, 6, 65-67.
- Ajlouni, S. & Gaungoo, Y. (2018). Enforcement of Food Legislation and Its Impact on Food Safety: A Case Study on Food Law Enactment in Mauritius, *Advances in Microbiology*, 8(2), 101-124.
- ArabianBusiness(2019). Egyptian resort tops global list for worst holiday locations for food poisoning. Retrieved on 29/09/2019, from <https://www.arabianbusiness.com/travel-hospitality/426234-egyptian-resort-tops-global-list-for-worst-holiday-locations-for-food-poisoning>.
- Bryan, F. L. (2002). Where we are in retail food safety, how we got to where we are, and how do we get there? *Journal of Environmental Health*, 65(2), 29-38.
- Cotterchio, M., Gunn, J., Coffill, T., Tormey, P., & Barry, M. A. (1998). Effect of a manager training program on sanitary conditions in restaurants. *Public Health Reports*, 113(4), 353.
- Dalkey, N. C. (1969). *The Delphi method: An experimental study of group opinion*. Spain: Rand corp Santa Monica calif.
- Delbecq, A. L., Van de Ven, A. H., & Gustafson, D. H. (1975). *Group techniques for program planning: A guide to nominal group and Delphi processes*. London: Scott, Foresman,
- Dalkey, N., & Helmer, O. (1963). An experimental application of the Delphi method to the use of experts. *Management science*, 9(3), 458-467.
- Duffy, M. P. 15 May 2008. One-on-one or one-online? Retrieved on 18/09/2019, from: http://goliath.ecnext.com/coms2/gi_0198-476336/One-on-One-or-One.html.
- Egan, M. B., Raats, M. M., Grubb, S. M., Eves, A., Lumbers, M. L., Dean, M. S., & Adams, M. R. (2007). A review of food safety and food hygiene training studies in the commercial sector. *Food control*, 18(10), 1180-1190.
- Elhawary, S. (2018). 3 incidents of food poisoning in floating hotels raise suspicion. Retrieved on 18/04/2019, from: <https://daily.rosaelyoussef.com>.
- Fefer, J. P., De-Urioste Stone, S., Daigle, J., & Silka, L. (2016). Using the Delphi technique to identify key elements for effective and sustainable visitor use planning frameworks, *Sage Open*, 6(2), 1-16.

- Food Safety Authority of Ireland (2001). Guide to food safety training, Abbey Court, Lower Abbey Street, Dublin. Retrieved on 18/04/2019, from: <https://www.fsai.ie>.
- Fox, D. (2020). A study of food safety training and associated barriers to effective training outcomes. (MSC). *Technological University Dublin*. doi:10.21427/24xe-4f71.
- Gil-Lafuente, A. M., Merigó, J. M., & Vizuete, E. (2014). Analysis of luxury resort hotels by using the fuzzy analytic hierarchy process and the fuzzy Delphi method. *Economic research-Ekonomska istraživanja*, 27(1), 244-266.
- Gruenfeldova, J., Domijan, K., & Walsh, C. (2019). A study of food safety knowledge, practice and training among food handlers in Ireland. *Food Control*, 105, 131-140.
- JHIC (Joint Hospitality Industry Congress) (1997). *Industry Guide to Good Hygiene Practice: Catering Guide*. London: HMSO.
- Johnston, L. M., Wiedmann, M., Orta-Ramirez, A., Oliver, H. F., Nightingale, K. K., Moore, C. M & Jaykus, L. A. (2014). Identification of core competencies for an undergraduate food safety curriculum using a modified Delphi approach. *Journal of Food Science Education*, 13(1), 12-21.
- Jones, D. L., Day, J., & Quadri-Felitti, D. (2013). Emerging definitions of boutique and lifestyle hotels: A Delphi study. *Journal of Travel & Tourism Marketing*, 30(7), 715-731
- Keeney, S., McKenna, H., & Hasson, F. (2011). *The Delphi technique in nursing and health research*. London: John Wiley & Sons.
- Khalife, L. (2019). Resort town in Egypt ranked 'worst' holiday spot due to food poisoning. Retrieved on 07/12/2019, from: <https://stepfeed.com/resort-town-in-egypt-ranked-worst-holiday-spot-due-to-food-poisoning-6309>
- Kim, K. K., O'Bryan, C. A., Crandall, P. G., Ricke, S. C., & Neal Jr, J. A. (2013). Identifying baseline food safety training practices for retail delis using the Delphi expert consensus method. *Food control*, 32(1), 55-62.
- Kirkpatrick, D., & Kirkpatrick, J. (2006). *Evaluating training programs: The four levels*. USA: Berrett-Koehler Publishers.
- Magdy, H.; Elghazaly, M.; Samy, S. Afifi, S. Hanaa Ghonim (2018). A Large Staph aureus Food Poisoning Outbreak among Hotel Guests, Sharkia Governorate, Egypt- July 2018, 10th TEPHINET Global (2019, USA), Retrieved on 15/04/2020, from: <https://www.tephinet.org/learning/fead/a-large-staph-aureus-food-poisoning-outbreak-among-hotel-guests-sharkia-governorate>
- McFarland, P., Checinska Sielaff, A., Rasco, B., & Smith, S. (2019). Efficacy of food safety training in commercial food service. *Journal of food science*, 84(6), 1239-1246.
- Murry Jr, J. W., & Hammons, J. O. (1995). Delphi: A versatile methodology for conducting qualitative research. *The review of higher education*, 18(4), 423-436.
- NFSA, (2020). The National Food Safety Authority Retrieved on 20/10/2020, from [www.nfsa.gov.au/S\(nguuur5pwdhp2zsovtdjddvu3\)/App_PP/DeskTop/App_Web/App_Custom/1/Default.aspx?TabID=10000000](http://www.nfsa.gov.au/S(nguuur5pwdhp2zsovtdjddvu3)/App_PP/DeskTop/App_Web/App_Custom/1/Default.aspx?TabID=10000000)
- Nguyen-Viet, H., Tuyet-Hanh, T. T., Unger, F., Dang-Xuan, S., & Grace, D. (2017). Food safety in Vietnam: where we are at and what we can learn from international experiences. *Infectious diseases of poverty*, 6(1), 1-6.
- Osama, S. (Tuesday 8 Oct 2019). 70 hospitalised with food poisoning from fesikh in Alexandria, Ahram, Retrieved on 15/11/2019, from: <https://english.ahram.org.eg/News/352418.aspx>
- Paraskevas, A. (2012). Beyond consensus: an alternative use of Delphi enquiry in hospitality research, *International Journal of Contemporary Hospitality Management*, 24(6), 9-7-924.
- Rennie, D.M., (1995). Health education models and food hygiene education. *Journal of the Royal Society of Health* 115, 75-79.
- Rennie, D.M., (1994). Evaluation of food hygiene education, *British Food Journal*, 96 (11), 20-25.
- Seaman, P. (2010). Food hygiene training: Introducing the food hygiene training model. *Food Control*, 21(4), 381-387.
- Seaman, P., & Eves, A. (2006). The management of food safety—the role of food hygiene training in the UK service sector. *International journal of hospitality management*, 25(2), 278-296.
- Seaman, P., and A. Eves (2010). Perceptions of hygiene training amongst food handlers, managers and training providers — A qualitative study. *Food Control*, 21, 1037-1041.
- Sobaih, A. E. E., Ritchie, C., & Jones, E. (2012). Consulting the oracle? Applications of modified Delphi technique to qualitative research in the hospitality industry. *International Journal of Contemporary Hospitality Management*, 24(6), 886-906.
- Soon, J., Baines, R., & Seaman, P. (2012). Meta-analysis of food safety training on hand hygiene knowledge and attitudes among food handlers. *Journal of Food Protection*, 75(4), 793-804.
- Sprenger, R.A. (2009). *Hygiene for Management*. (15th ed), London: Highfield, Doncaster.
- Todd E. (2016). Foodborne Disease in the Middle East. *Water, Energy & Food Sustainability in the Middle East, the Sustainability Triangle*, 7, 389-440.
- Wallace, C.A. (2014). Food Safety Assurance Systems: Hazard Analysis and Critical Control Point System (HACCP): Principles and Practice. *Encyclopedia of Food Safety*, 4, 226-239.
- WHO (2019) Food safety. In Fact Sheet; World Health Organization: Geneva, Switzerland; Retrieved on 15/2/2020, from: <https://www.who.int/news-room/fact-sheets/detail/food-safety>

- WHO. (2015). WHO estimates of the global burden of foodborne diseases: food-borne disease burden epidemiology reference group 2007-2015. WHO LibraryCataloguing-in-Publication Data; 1–252.
- Wolfe, E. W., Matthews, S., & Vickers, D. (2010). The effectiveness and efficiency of distributed online, regional online, and regional face-to-face training for writing assessment raters. *The Journal of Technology, Learning and Assessment*, 10(1), 1–21.
- Worsfold, D., Griffith, C., & Worsfold, P. (2004). A survey of environmental health officers' views of food hygiene training. *British Food Journal*, 106(1), 51-64