

Food Safety Culture and Risk Factors: A Case Study in Melaka Tourist Spots

Journal of Tourism, Hospitality & Culinary Arts (JTHCA)
2022, Vol. 14 (1) pp 474-491
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UiTM Press
Submit date: 20th September 2021
Accept date: 03rd November 2021
Publish date: 31st May 2022

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Proposed citation:

Abidin U. F. U. Z., Roslan A., Mustafar S. S., Mutalib N. A. A., Ishak F. A. C., Sanny M., & Karim M. S. A. (2022). Food Safety Culture and Risk Factors: A Case Study in Melaka Tourist Spots. *Journal of Tourism, Hospitality & Culinary Arts*. 14(1), 474-491.

Abstract

The purpose of this study is to examine the elements of food safety culture in micro and small restaurants located in tourist spots and to assess risk factors of food handler noncompliance. The study employed a qualitative approach, collecting data through observation and interviews with restaurant managers and food handlers. A total of 20 informants from 10 restaurants participated in interview sessions. Altogether ten themes emerged based on elements of food safety culture within micro and small restaurants: 1) leadership and management support, 2) communication, 3) management system, style, and process, 4) accountability, 5) internal environmental factors, 6) risk perception and risk awareness, 7) teamwork, 8) work pressure 9) customer perception, and 10) home culture. In this study, two new themes emerged in comparison to previous works: 1) customer perception and 2) home culture. The findings indicate that food safety culture in micro and small restaurants is formed primarily through interpersonal skills rather than job-specific knowledge and skills. Interpersonal attributes and the ability to work with others are required, which include communication, leadership, self-commitment, and teamwork. The observation results showed that the two most commonly occurring risk factors out of compliance in the studied restaurants were poor personal hygiene and improper holding time and temperature. The findings provide insights into the food safety culture of this under-studied context to help better planning on training strategies and development of interventions to improve food safety practices.

Keywords:

Food Safety Culture; Food handler; Risk factor; Tourism; Food Safety

1 Introduction

Food has a significant role in attracting tourists to a destination as this segment is already popular in the tourism industry and has good prospects (Southwood & Henderson, 2009). Food could be a primary or secondary inspiration for tourists to decide for the vacation (Sharina & Norwani, 2020). Foodservice has become a significant setting that affects tourist choices and their overall experiences of vacation (Yong, Lori & Jinwon, 2019). Therefore, the aspect of food safety significantly influences the tourist in traveling destination selection. Additionally, World Health Organization (2013) has highlighted that foodborne illness significantly strains healthcare, trade, and tourism. In order to control food safety issues at every tourism destination, interventions of food safety are required from both the tourism industry and the foodservice industry (Yong et al., 2019).

Due to the Covid-19 pandemic, the majority of nations in the world, including Malaysia, shut their border on leisure travel to curb the outbreak of Covid-19. With no inbound travellers, businesses depend greatly on the domestic market to ensure business survivability. These have caused a dramatic change in Malaysia's tourism performance, in which a more than 80% decrease in tourist arrival was and total tourist expenditure for the year 2020 compared to 2019 (My Tourism Data, 2021). However, it was reported that the food and beverage industry remain the highest-ranked expenditure component after shopping for domestic travel. Greater responsibility is placed on the foodservice industry to do their utmost to ensure the food they serve is safe because we are also seeing customers is placing higher expectations in terms of food safety aspect in the situation of the pandemic (Malaysia Ministry of Tourism, Arts and Culture, 2020)

Even before the Covid-19 pandemic hit the world, the foodborne disease is a pertinent issue still encountered by the food industry. The Malaysia Ministry of Health reported that food poisoning cases in Malaysia are increasing from 45.71 per 100,000 population in 2018 to 50.90 per 100,000 population in 2019. Several studies have revealed that foodborne illness frequently occurred from food handlers working at foodservice operations (Angelo et al., 2017; Fujikasi, 2018; Greig et al., 2007). The FDA (2020) reported that two-thirds of restaurant outbreaks were caused by infected personnel handling food. In addition, most foodborne illnesses are strongly associated with the food handlers as the attitudes and cultures in their workplace can influence their working style and behavior (Salleh et al., 2017). As many food safety issues and accidents result from employee practices, attitudes, or behaviors, today, food safety culture emerges as a new concept to understand food safety as it goes beyond food safety management systems; an organization's prevailing food safety culture, and organization's internal and external environment.

In Malaysia, some interventions are being applied, such as surveillance and monitoring, proper training for preventive control, implementing the food safety management systems, and risk models, as the steps to reduce foodborne diseases (Nik et al., 2016). Besides, food safety management systems such as HACCP, Good Manufacturing Practices (GMP), *Makanan Selamat Tanggungjawab* (MeSTI) certification and Clean, Safe and Healthy (BeSS) certification and Trust My Catering are widely promoted to help food businesses ensure all employees are aware of food safety concerns.

Many previous studies reported that food handler's attitude and practice decision-making are influenced by the perceived food safety culture in an organization (Yiannas, 2009; Griffith et al., 2010b; De Boeck et al., 2016; De Boeck et al., 2017; Fujikasi et al., 2018). However, in Malaysia, most research has focused on measuring food safety knowledge through applying the knowledge, attitudes, and practice (KAP) model. Although other human behaviors and organizational culture factors are crucial for success, food safety culture is not widely studied.

Because the food and beverage business is one of the segments needed by tourists, which substantially contributed to the growth of the tourism industry, this study purposefully focuses on foodservice operations located in the tourist region in Malaysia. To prevent foodborne illness among the tourists, the owner or manager of foodservice operations needs to know and apply food safety principles to motivate employees adhering to the good food safety practice in shaping good food safety culture in the organisation. Therefore, this study aims to assess the elements of food safety culture and the risk factors out-of-compliance among food handlers within foodservice operations located at tourist region in the State of Melaka, Malaysia.

2 Literature Review

2.1 Food safety culture

According to Griffith et al., (2010b), food safety culture is defined as "a subset of organizational culture which initially is the shared food safety attitudes, values and beliefs that are regularly reflected in food handling organisations. Likewise, Yiannas (2009) holds the view that food safety culture has been defined as "how and what the employees in a company or organization think about food safety."

A broader perspective has been stated by Yiannas (2009) that organizations can opt for a strong culture of food safety such as leaders are responsible for instigating it, as they have the authority and can influence others to build a positive culture of food safety to reduce the foodborne disease which is the common global problems. The continued occurrence of foodborne illnesses has been increasingly recognized as a serious worldwide public health concern are usually related to the inconsistencies in food safety culture. This indicates the shortcomings of current Food Safety Management System (FSMS), which has raised concerns about the adequacy of such structures to guarantee food safety as a whole (Kirezieva et al., 2013).

Food safety culture research were performed in organizations such as food manufacturing (Ball et al., 2009; De Boeck et al., 2015), food processing companies (De Boeck et al., 2015; Nyarugwe et al., 2020), and institutional foodservice (Fujikasi et al., 2018; Griffith et al., 2016; Ungku Fatimah et al., 2014). Similar studies were also carried out in high-income countries: Japan, the United States and, respectively, two in Belgium. In a low-income region, only one study was found conducted in dairy companies (Nyarugwe et al., 2018). There are still fewer studies exploring food safety culture in smaller food facilities, such as restaurants. The different elements of food safety culture can be found in smaller food facilities, such as restaurants, due to the different factors that shape the positive food safety culture in the organization.

2.2 Elements of food safety culture

A number of researchers have suggested various factors that impact the food safety culture (Ball et al., 2010; Griffith et al., 2010; Neal et al., 2012; Taylor, 2011; Ungku Zainal Abidin et al., 2013; Yiannas, 2009). These factors were introduced from a broader area of research, including safety and health sciences, management, international industry, psychology, and food production. Researchers suggested that food safety culture could be assessed based on workers' perceptions of these elements, which include leadership, commitment, knowledge, training, risk awareness, risk perception, management system, accountability, employee involvement, communication, work pressure, environmental factor, value, and behaviour (Ball et al., 2010; De Boeck et al., 2015; Ungku Fatimah et al., 2014; Yiannas, 2009).

A core component of a food safety culture is the dedication of management to food safety, as it is understood to be related to behaviors and procedures of food safety (Faour-Klingbeil et al., 2015). Management failures, including insufficient preparation, weak and poor organization, and monitoring, have been cited as causative factors in several foodborne disease outbreaks. According to Griffith et al. (2010), leadership in food safety can be described as a measure of the degree to which the business leader should involve workers in hygiene and health management and action to achieve the business' objectives, vision, or standards.

Food safety culture within an organization can be noticed quickly by looking at their communication, whether it is lacking or not (Yiannas, 2009). Food safety communications are significant as they make the message more likely to be understood by workers in organization. Communication can be described as a business method that explains how individuals, groups, and organizations transfer information to other individuals, groups, and organizations inside and outside companies (Greenberg & Baron, 2008). Creating a culture of food safety requires applying the best science with the best management, but communication systems also play an essential part in establishing it (Powell et. al., 2011).

2.3 Food Safety Risk Factors

Food Drug Administration conducted studies on food safety risk factors in 1998, 2003 and 2008 to measure compliance with food safety behaviors and practices as

outlined in the food code for institutional foodservice, restaurants, and retail food stores. Although improvements occurred over the 10-years study period, the FDA reported that improper holding/time and temperature, poor personal hygiene, contaminated equipment, and inadequate protection from contamination were the remaining areas that are still need to be improved, which are parts of the five key contributors to foodborne disease. These risk factors associated with foodborne disease need to be managed effectively and prioritized by all food handlers. Although workers will be trained about what needs to be done to prepare and handle food safely, actual behaviors may not be consistent with learned preventative measures (Chapman et al., 2010; Roberts et al., 2008; Tokuc et al., 2009).

Foodborne diseases associated with inadequate food handling have become more frequent in the past few decades, such as improper cooking procedures, improper holding times and temperature, lack of hygiene and sanitation by food handlers, cross-contamination between raw and fresh ready-to-eat foods, and also acquiring food which from the unsafe sources (Green & Selman, 2005; Chapman et al., 2010; Pichler et al., 2014; Powel et. al., 2011). According to Chapman et al. (2010), four out of five of these practices are related directly to foodservice food handler behavior (acquiring foods from unsafe sources is the exception), and these practices were identified as the risk factors or the main contributors to foodborne illnesses (World Health Organization, 2006). Even though it is hard to obtain accurate statistics, approximately up to 70% of foodborne diseases are correlated to food prepared outside of the home in North America (Olsen et al., 2000; Lee et al., 2003; Klein et al., 2008), such as eating meals prepared in a foodservice establishment.

3 Methodology

A qualitative approach was employed to enable researcher gained in-depth data from the participants on the possible factors which influence their food safety practices. The scope covers employees' motivators, barriers and perceptions towards food safety as adapted from previous research (Thaivalappil et al., 2018). Semi- structured interview was used in this study to provide informants with some guidance, while allowing the interviewer to "probe" answers to questions when more in-depth information is required (Griffith, 2014).

3.1 Participant sampling

Semi-structured interviews were conducted with the food handlers, consisting of restaurant owners, managers, and full-time employees working in the foodservice operation. A total of 10 restaurants comprising small and micro-sized foodservice operations located in the tourist region in the State of Melaka, Malaysia, was selected involving 20 research informants. The purposive sampling technique was employed to select the sample involving food handlers from small and micro-sized foodservice operations. The informants were selected based on several criteria, including a) minimum of 1-year experience in restaurant operation, b) involvement with food

handling, c) age above 18 years old, and d) being able to communicate in Malay or English. These selection criteria were developed to ensure the participants could provide information on their workplace food safety culture.

This study recruited small and micro-size foodservice operations located in Melaka. The organization size of foodservice operation was based on the Small Medium Enterprise Corp. Malaysia (2013). Table 1 indicates the summary of organization characteristics.

Table 1: Organisation characteristics

Characteristics	Small-size	Micro-size
Total number of employees	From 5 to ≤ 30	≤ 5
Annual sales turnover	From RM300,000 to ≤ 3 million	≤ RM300,000

3.2 Data Collection

The sampling data was developed by listing the numerous lists of restaurants in Melaka that were selected based on the suggestions made by TripAdvisor Malaysia. The participants were contacted via phone call or email. Permission to conduct research was requested upon arriving at the restaurant from the person in charge. A semi-structured interview protocol was developed that consisted of key questions on factors affecting food safety practices in the workplace and covered specific criteria used to assess food safety culture, including food safety leadership, standards, and documentation; food safety communication; food safety training, competence, and supervision; food safety commitment and support; food safety assessment, monitoring and consequences (Griffith, 2017). The interview session was conducted at the participant's workplace, lasting between 25 to 45 minutes per informant. The interviewer briefed the participants about the study's objectives and explained that the interviews would be audio-recorded and transcribed. The interviews were conducted in the Malay language as the majority of participants preferred it.

Next, the observation process was done with an average of 30 minutes duration per restaurant. The observation was conducted using an observation form adapted from the FDA study on the occurrence of foodborne illness risk factors in selected fast food and full-service restaurants (FDA, 2018). After discussing and explaining to the person in charge, the researcher observed the restaurants' kitchen. Visual observations of food safety practices were supplemented by asking the food handler or manager questions to ensure a clear understanding of food processes and procedures. The aim is to identify the critical food preparation processes being conducted during the inspection so that inspection priorities and flow can be determined (FDA, 2018).

3.3 Data Analysis

Participant audio records were transcribed verbatim in Malay and translated into English. The interview questions were developed based on the previous study; thus, some of the themes were pre-determined. New themes and sub-themes that emerged from the data were added, making the analysis both deductive and inductive (Berg, 2004). This study applied thematic analysis, which identifies, analyses, and describes patterns in data (Braun & Clark, 2006). The thematic analysis allows themes to be derived in an inductive or deductive manner, and it is not bound to any specific theory or data collection method (Braun & Clark, 2006). In this study, the transcriptions were imported into Atlas.ti version 9 for coding, sorting, and easy retrieval of coded quotes and generating a visual display of codes' analysis and frequency report (Ahmad et al., 2017). Two validation strategies were applied for ensuring the data trustworthiness, which a) peer review was done by referring to the experts (i.e., academia) and b) member checking which data transcribed were passed to informants to check and make confirmation regarding the findings. For observation, the data were key-in, and the total number and percentage of restaurants out-of-compliance for each data item was calculated using Microsoft Excel.

4 Findings

4.1 Respondent's Profile

A total of 20 informants took part in semi-structured interviews from ten foodservice operations. Table 1 presents the respondents' profiles that participated in this study. A majority of participants in this study were female (60%, n=12) and had less than two years of experiences working in the foodservice industry (45%, n=9). Most of the participants involved in this study were operation leaders, restaurant owners, and managers (60%, n=12). Almost all of the participants in this study had received the food handlers training (95%, n=19). There were 14 informants from micro restaurants and six informants from small restaurants. All of the informants interviewed from each restaurant are Malaysians.

Table 2: Respondent's profile

Characteristic of the Informants	Frequency (n=20)	Percentage (%)
Gender		
Male	8	40
Female	12	60
Years worked in foodservice industry		
Less than 2 years	3	15
3-5 years	6	30
5-10 years	5	25
More than 10 years	6	30
Years works in current operation		
Less than 2 years	9	45

3-5 years	2	10
5-10 years	4	20
More than 10 years	5	25
Job Position		
Restaurant owner	5	25
Restaurant manager	7	35
Kitchen crew	6	30
Service crew	2	10
Received food handlers training		
Yes	19	95
No	1	5

Source: Research Question

4.2 Elements of Food Safety Culture

The current study identified the employees' motivators, barriers, and perceptions of safe food handling practices that shape the food safety culture in the organization. There are ten (10) main themes emerged, which comprised of 35 sub-themes which 1) leadership and management support, 2) communication, 3) management system, style, and process, 4) accountability, 5) internal environmental factors, 6) risk perception and risk awareness, 7) teamwork and 8) work pressure 9) customer perception and 10) home culture. Table 2 summarizes key themes and subthemes of food safety culture.

Table 3: Summary of key themes and sub-themes of food safety culture

Themes	Sub-themes
1. Leadership and management support	1.1 Monitor 1.2 Role Model 1.3 Physical engagement 1.4 Firm 1.5 Integrity 1.6 Guide
2. Communication	2.1 Openness 2.2 Respect 2.3 Bottom-up approach 2.4 Clarity 2.5 Feedback 2.6 Update
3. Food safety management system & style	3.1 Policy and Procedure 3.2 Implementation 3.3 Training 3.4 Employee's knowledge 3.5 Job duties
4. Accountability	4.1 Praise 4.2 Warning 4.3 Internal rules and regulations 4.4 External rules and regulations 4.5 Responsible

5. Environmental Factors	5.1 Availability of equipment
	5.2 Availability of facilities
	5.3 Quality of infrastructure
6. Risk perception and Risk awareness	6.1 Risk Perception
	6.2 Risk Awareness
7. Teamwork	7.1 Co-worker's support
	7.2 Between manager and staff
8. Work Pressure	8.1 Time constraint
	8.2 Inadequate staff
9. Customer perception	9.1 Desire to attract customer
	9.2 Desire to satisfy customer
10. Home Culture	10.1 Good culture of home
	10.2 Poor culture of home

Source: Research Question

Leadership: This theme comprises several roles of leaders that influence employees to apply safe food handling practice in their daily routine: monitor, role model, physical engagement, firm, integrity, and guide. Participants agreed that their managers showed commitment by guiding them on the proper food safety practices and physically engaging in any task related to food safety. Managers' managers emphasized that monitoring the employees is the best technique to ensure safe food handling practice is applied in operation. Most of the participants believed leaders should act as a role model by showing a good attitude towards food safety during working that may cultivate a good perception among the subordinate towards food safety and motivate them to apply food safety practices in the daily routine. The following quotation is an example of the importance of being a good role model and monitoring process in operation:

*"Other than that, **we have to be the role model for our workers.** It is pointless if we talk and remind them, but we, as manager, ourselves do not show the good examples to them. For example, I will use different chopping boards for different types of food and before I start working, I will wash my hands" (female, small foodservice).*

*"**Check the kitchen, check the kitchen's cleanliness, monitor production staffs every day,** and I will also on monitor on their attitude in terms of their attendance and personal hygiene" (male, small foodservice).*

Communication: Participants explained several aspects of communication: openness, respect, bottom-up-approach, clarity, feedback, and update. Participants mentioned that open communication between employees had been practiced so that any activities or practices related to food safety could be assured. The bottom-up approach communication was applied in ensuring all the related to food safety were acknowledged by all levels of employees. Participants mainly mentioned the aspect of respect and updated that they agreed that any food safety issue associated with the customer will be updated to the management. Most managers or owners believe that they have to respect their employees when they communicate about any issues raised

on food safety. The following quotation describes how the communication on food safety issues had been a practice in the operation:

“If it needs attention from the top management, I will let them know. Make a report, for example, an expired fire extinguisher and need to be replaced, a broken chiller and freezer; I will directly inform the top management for them to get it fixed” (female, micro foodservice).

“I have seen my co-worker going out from the toilet and forget to wash their hand before start handling food. So that’s why I sometimes take the initiative to keep on remind my co-worker to wash their hand first especially after going out from the toilet” (male, small foodservice).

Food safety management system, style, and process: Several aspects relating to the food safety management system were mentioned by the participants: policy and procedure, implementation, training, employee knowledge, and job duties. Two aspects that all participants consistently raised were policy & procedure and training. Participants mentioned that they followed the standard procedure set by the management as they can explain some of the procedures that comply with the food safety practices. The participants also noted that they have to attend any training related to food safety that meets the government requirement. The following quotation is an example that illustrates the aspect of policy and procedure and training set by the management:

“We have SOP. So, when I start working in this restaurant, I have to follow the SOP such as wearing proper attire. We have to keep ourselves neat by wearing apron, shoes and keep our nails short” (male, small foodservice).

“We send all our staff to the food handling training even though they have attended before this but, we will still send them to the training so they can recap all the basic knowledge” (female, micro foodservice).

Accountability: Various aspects of accountability were described by the participants, including praise, warning, internal rules and regulations, external rules and regulations, and responsible. Most of the participants mentioned that the operation leader takes a serious on food safety issues by warning those who did not apply the proper food safety practices that could cause consequences to affect the customer. However, the participants stated that if their operation is free from any food safety issue, the operation leader will praise their subordinates, motivating them to adhere to the correct food safety practices. All the participants consistently mentioned that the external rules and regulations were extensively implemented to ensure the operation follows the particular authority's rules and regulations. The following quotation describes the aspect of accountability that encourage the food handlers in adhering to good food safety practices:

“Usually, when my staff did something good, so I will praise them. For example, if customer give good feedback on the cleanliness of this restaurants, so I will tell my staff and praised them. So, by giving the compliment to them, they will keep maintaining the cleanliness of the restaurant” (male, small foodservice).

“I always make sure to keep my restaurant clean and tidy because the MBMB authorities tend to do inspection without prior notice, so I was worried about that. I will make sure my kitchen always cleans and all ingredients put inside the covered containers” (male, small foodservice).

Internal environmental factors: Participants mentioned that enough facilities and equipment in operation is vital to encourage the employees to adhere to food safety practices in their daily routine. The participants agreed that facilities and equipment were well prepared by their management, which convenient for them to implement the proper food safety practices. The following quotations were mentioned by the participants that refer to availability of resources in the premise:

“I also prepared different sink for my staff which is a sink for handwashing, sink for dishwashing, and sink at the beverage preparation area” (female, small foodservice).

“For instance, I have provided about four refrigerators that are specified for different temperatures” (female, small foodservice).

However, some participants noted that the poor-quality infrastructure in the premises caused difficulties in maintaining the cleanliness of the premises. The following quotation was mentioned by a participant regarding this aspect:

“Because our restaurant is located beside the road, so we cannot avoid rat entering our premise” (female, small foodservice).

Risk perception and risk awareness: The organizations were aware of the risk of not complying with food safety regulations and how adequate precautions were taken to avoid the risk. Apart from that, the participants were aware of the effect of food poisoning on customers and the food operation business. The following quotations were mentioned by the participants that refer to risk perception and risk awareness:

“I always remind them, do not let our restaurant be associated with issues like causing customers to have food poisoning after eating the food we served. It will impact us badly” (female, small foodservice).

“Because we serve the food for customer to consume, we don’t want the food is contaminated. So, when we serve food to customer, we will make sure the food is safe to eat” (male, small foodservice).

Teamwork: Participants consistently mentioned the aspect of co-workers' support and teamwork between manager and staff. They agreed that all employees need to play their roles by supporting each other to meet the objective of food safety set by the

management. The following quotation explains how teamwork in operation is significant to cultivate the food safety culture among all the employees:

*“During the peak hours, I will cook the foods; **during the free hours, I will help others to clean up, wash plate like that**” (female, small foodservice).*

*“To maintain **the cleanliness, we need to have a teamwork, we as an owner can’t do everything by our own.**, so that is why we need to hire someone that alert about this” (male, small foodservice).*

Work pressure: Two aspects that consistently mentioned by the participants which were time constraint and inadequate staff. Participants stated that time constraints will restrict employees to properly follow the right procedures of food safety practices and will make it hard for them to comply with safe food safety policy. Additionally, some informants also mentioned that if the restaurants do not have enough staff, it will lead to work pressure and cause some difficulties for them to comply with the food safety practices as they are overloaded with multiple tasks. The following quotations are the example mentioned by the participants on the aspects of work pressure:

*“But sometimes we are overlooked when we cook something it is overcook or undercook. This usually happen because there are many customers especially during lunch hour, **and we tend to prepared the food quickly**, we don’t want them waiting for the food too long” (female, small foodservice).*

*“But sometimes, when the restaurant is packed with customers, **the kitchen would a bit messy because it gets hectic since we are busy handle our customers’ orders with only two people working, and I have to have to manage the counter as well. We are short of staffs** but I still will do all the works” (male, small foodservice).*

Customer perception: Participants mentioned hygiene and cleanliness of the restaurant is significant in attracting and satisfying their customer. Participants noted that customer perception of food safety and hygiene had triggered them to comply and adhere to good food safety practices when handling the food. A positive food safety culture could be cultivated if the food handlers are concerned about their customers' perception of food safety and hygiene. The following quotations describe the aspect of customer perception that motivate the food handlers to perform good food safety practices:

*“**Customers will be unsatisfied if cleanliness is not maintained** and will think that the food is unsafe to eat” (male, small foodservice).*

*“**To attract customers**, we must maintain the cleanliness of food, we have taken care the presentation of food. so that is one of the attractions for our customers” (male, small foodservice).*

Home culture: Most restaurant owners and manager participants consistently relate home culture with food safety culture. Participants described that the good and

poor culture of the home has significantly influenced the food handlers' attitude and practice on food safety and hygiene in their daily routine. Additionally, they believed that shaping a positive food safety culture in operation required good food safety practices starting from home. The following quotations illustrate the aspect of home culture that explained by participants:

“For me, if I have staff that not take care or concern about their own hygiene and not take care about the cleanliness because they used to act like that at home for example maybe at home after eat, they just put their plates in the sink without washing that plate. So, when at works they tend to act like how they act at home” (female, small foodservice).

“For me, if I have staff that not take care or concern about their hygiene and not take care about the cleanliness because they used to act like that at home” (male, small foodservice).

4.3 Risk factors out-of-compliance among food handlers.

Table 4 presents the result from observation on risk factors out-of-compliance among food handlers. This study found that nearly all establishments were out of compliance for at least one risk factor. It is found that the two most commonly occurring risk factors found out of compliance in all restaurants were improper holding/time and temperature and poor personal hygiene. Inadequate cooking was the least commonly occurring risk factor found out-of-compliance as all of the restaurants do not offer commercial Ready-to-eat food (RTE) for the data item, which was considered not available during the observation.

Table 4: Total number and percentage of restaurants out-of-compliance on food safety practices

Foodborne disease risk factor	Description of item observe	Total (#OUT)	Total observation (#IN and OUT)	% OUT
Poor personal hygiene	1. Employee practice proper handwashing	10	10	100
	2. Employees do not contact ready to eat food with bare hands	6	10	60
Contaminated equipment	3. Food is protected from across contamination during storage, preparation and display	5	10	50

	4. Food contact surfaces are properly cleaned and sanitised	4	10	40
Improper holding time/temperature	5. Foods requiring refrigeration are held at the proper temperature	10	10	100
	6. Food displayed or stored hot are held at proper temperature	1	10	10
	7. Food is cooled properly	2	10	20
	8. Refrigerated, RTE foods are properly date marked and discarded within 7 days	10	10	10
Inadequate cooking	9. Raw animal foods are cooked to required temperatures	2	10	20
	10. Cooked foods are reheated to required temperature	0	10	0

Source: Research Question

Note: #OUT – Total out-of-compliance; #IN and OUT – Total in and out-of-compliance, %OUT - Percentage out-of-compliance

5 Conclusion

This study assessed the food safety culture in foodservice operations located in the tourist region in the state of Melaka. This study found ten food safety culture elements in the foodservice operations: 1) leadership, 2) communication, 3) management system, style, and process, 4) accountability, 5) internal environmental factors, 6) risk perception and risk awareness, 7) teamwork, 8) work pressure, 9) customer perception, and 10) home culture. The elements of food safety culture that emerged in this study were consistently reported by the previous study from many types of operation (Ball et al., 2010; De Andre et al., 2020; De Boeck et al., 2015; Ungku Fatimah et al., 2014; Griffith et al., 2016; Neal et al., 2012; Nyarugwe et al., 2020; Yiannas; 2009). The finding shows that food safety culture in the micro and small restaurant is formed mainly based on the interpersonal skills as not related to job-specific knowledge and skills, but rather the

interpersonal attributes and ability to work with others such as the element of i) communication, ii) commitment of leadership, iii) self-commitment, and iv) teamwork among employees.

However, the elements of customer perception and home culture were identified as the new elements of food safety culture that emerged in this context of study. The respondents believed that perceiving the need to meet the desire to attract and satisfy customers can help the organization cultivate a positive food safety culture. The participants consistently mentioned the new theme of home culture. They believed that the attitude towards food safety and how their food safety practice at home influences the organization food safety culture as the attitude and practice they brought from home is applied in the workplace. On top of that, the results have shown that it is slightly inconsistent with the previous study in small franchise restaurants in Poland where leadership and communication factors are not the main contributions towards the food safety culture where the management does not emphasize clearly the importance of food safety in face-to-face or open conversations with employees. Instead, the work environment was assessed as the main factor (Wiśniewska et al., 2019). This study found two most commonly occurring risk factors with an out-of-compliance record in all restaurants: improper holding/time and temperature and poor personal hygiene.

This study provided new insight in understanding employees' motivators, barriers, and perceptions in safe food handling practices that could help shape positive food safety culture, specifically in the context of foodservice operations in tourist regions. Nonetheless, certain limitations should be considered. The finding of this study only reflects the elements of food safety culture in foodservice operations in the State of Melaka. The future study could explore the new element of food safety culture in other states of tourist regions in Malaysia.

In conclusion, this study found the new elements of food safety culture in the context of foodservice operations. It is essential to note that this study is a pioneering study that explored the element of food safety culture in the context of foodservice operations in the tourist region. The finding of this study could help both the tourism industry and the foodservice industry in planning strategies to curb food safety issues in the tourism destination.

6 Acknowledgment

This research was supported by the Fundamental Research Grant Scheme [FRGS/1/2019/SS03/UPM/02/3] Project Code: 05-01-19-2172FR and Malaysia Research University Network [(UPM/800-4/11/MRUN/2019/5539140] Grant Number: EP-2019-004.

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