

An Ethnographic Survey of Culinary Students' Behaviours in the Implementation of Food Safety and Hygiene Practices

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ABSTRACT

Sufficient knowledge on food safety and diligence during food handling are crucial to food safety and hygiene practices. A casual approach to handling food in the kitchen on a regular basis may link to foodborne pathogens, contaminations, and adverse health effects. The purpose of this study is to identify the right practices and behaviour among culinary students in terms of food hygiene practices and food safety perspectives. The methodology employed includes observations on 18 food culinary students in an actual kitchen setting. Effective food hygiene and food safety implementation are needed to improve the effectiveness of health education programmes for food handlers. The results suggest that transmission reduction of food pathogens, knowledge transfer and food safety training in selective industry criteria with proper guidelines should be introduced to produce a competent workforce.

Keywords: Culinary, culinary students, food safety, hygiene practices

ARTICLE INFO

Article history:

Received: 19 February 2017

Accepted: 17 July 2017

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INTRODUCTION

Food hygiene and food safety (FHS) is an important aspect of public health. Foodborne illness is a major health concern that can severely impact society and can incur a huge financial burden on our health care system. People have become increasingly aware of the food they consume and are more cautious about food safety considerations. Diarrheal

diseases have been found to be responsible for more than half of the global burden of foodborne disease annually, causing 550 million people to fall ill and 230,000 to die (World Health Day, 2015). More than 250 foodborne diseases are caused by various pathogens (bacteria, viruses, and parasites) and toxins (industrial chemical and biotoxins) of which, the most deaths are caused by diarrheal diseases worldwide (Fleury, Stratton, Tinga, Charron, & Aramini, 2008; Linscott, 2011).

Foodborne issues have been highlighted to indicate that access to safe food practices is crucial for community health (Saad, Poh, & Adil, 2013). In the United States of America, Scallan et al. (2011) estimated that 31 pathogens cause 228,744 hospitalisations every year, of which about 24% or 55,961 cases are due to the consumption of contaminated food. Of these, 64% were caused by bacteria, 25% by parasites, and 12% by viruses. Estimates of the overall number of episodes of food-borne illness are helpful for allocating resources and prioritising interventions.

Lack of knowledge of food safety and due diligence during preparation, processing, and storage of food can be considered a violation of food safety (Abdul-Mutalib et al., 2012). From the Malaysian perspective, Abdullah Sani and Siow (2014) revealed inadequate knowledge on food hygiene, poor hygiene practice, and poor attitude in sanitation and food safety among food handlers. Bolton, Meally, Blair, McDowell and Cowan (2008) said that previous researchers had emphasised effectiveness and that compulsory food safety training on a regular and ongoing basis should be conducted to eliminate possible misleading regards of food safety issues.

In relation to this, culinary school is one channel that actively provides theoretical and practical knowledge transfer in preventive measures to overcome FHS issues. Nevertheless, so far, the theoretical class, practical kitchen, and culinary internship have affected implementation of FHS among culinary students in Malaysia. The aim of this paper is to conduct an empirical study on student behaviours in hands-on activity during practical class. During the observation process, the student monitors his or her behaviour during food preparation at the workstation. Any behaviour which leads to FHS issues is reported in this study.

LITERATURE REVIEW

Food Hygiene and Food Safety Knowledge among Food Handlers

Foodborne illnesses are referred to as diseases, “usually either infectious or toxic in nature, caused by agents that enter the body through the ingestion of food” (World Health Day, 2015). Various foodborne pathogens have been identified for foodborne illness: *Campylobacter*, *Salmonella*, *Listeria Monocytogenes*, and *Escherichia Coli* O157:H7 have been found to be responsible for the majority of foodborne outbreaks (Alocilja & Radke, 2003; Chemburu, Wilkins, & Abdel-Hamid, 2005). Most of the earlier and recent food product recalls were also due to these pathogens (Belson & Fahim, 2007).

Accordingly, programmes and good practices are considered to reduce the pathogenic microorganisms in food at a significant level. Methodical programmes include good agricultural practices (Kay et al., 2008), good manufacturing practices, GMP (Jali, Ghani, & Nor, 2016), hazard analysis and critical control points, HACCP (Jin, Zhou, & Ye, 2008), and the food code

indicating approaches (Piatek & Ramaen, 2001). However, the role of human intervention remains vital, which is the key to prevention of problems related to health and safety. In the following section, human interventions when processing food that cause the transmission of various pathogens, their weaknesses, and the actions to be taken will be discussed.

Culinary Students

According to Saad, See, Abdullah and Nor (2013), the cooking process is intended to obliterate harmful microorganisms and ensures the food prepared is microbiologically safe for human consumption. This technique of safe food handling needs to be taught by competent instructors. The implied assumption is that continued education and training in food hygiene and safety could strengthen food handlers' knowledge (Seaman, 2010).

Despite the growth of culinary schools and the rise in the number of trained food handlers, food poisoning cases are still prevalent in commercial catering, mainly due to poor handling practices (Jeinie, Saad, Sharif, & Nor, 2016). Effective FHS implementation in culinary school can be strengthened through continued theoretical and practical food handling and safety learning. In the culinary programme, students are assigned to a culinary internship as part of the culinary syllabus.

With this training, it is expected that food handlers will adopt good hygiene practices, which will lead to the reduction of foodborne diseases (Zain & Naing, 2002). Therefore, future food handlers should master the knowledge and skills needed to ensure the safety of the food they provide. Effective FHS implementation is much needed to improve the effectiveness of health education programmes for food handlers.

MATERIALS AND METHOD

The ethnographic method uses two major tools which are applied in this research, that is, observations and photo-taking. Visual material is quoted as an integral part of the research process, be it as a form of data, a means for generating data, or a method of representing results (Knowles & Sweetman, 2004).

Participants

The participants for the study were culinary programme students of Culinary Art Management (HM245), Faculty of Hotel and Tourism Management (FHTM), Universiti Teknologi MARA (UiTM). A total of 18 culinary students were interviewed and observed via a mounted action camera to know their behavioural patterns in implementing food safety and hygiene practices at their workstations. The culinary students were selected because the respondents in this study were considered progressive, health and quality conscious and mentally competent to react to the implementation of food safety and hygiene practices. These students come from diverse pre-university backgrounds from both non-culinary programmes and culinary-related programmes. Some participants had undergone their culinary internship. The culinary internship varied, depending on the type of hotel, place of internship and star rating.

Setting for the Study

This study is set up at the workstation in an FHTM mock kitchen. During the process of observation, three action cameras (a unit of GoPro Hero4 Silver Edition, two units of SJCAM model M10) and a unit of the digital single-lens reflex camera (Nikon DSLR model D90) were used to record their activities and tap real field experiences at the workstation. As such, equipment is one of the primary sources of ethnographic data collection.

RESULTS

Participant Characteristics

Participant are categorised into three characteristics: gender, postgraduate status, and Cumulative Grade Point Average (CGPA). For the interpretation, the group of participants is simplified and presented in Table 1.

Table 1
Participants' characteristics

Characteristics	Total Sample n = 18	
Gender		
Male	8	44.4
Female	10	66.6
CGPA		
≤ 2.00	0	0
2.01-2.50	2	11.1
2.51-2.00	5	27.8
3.01-3.50	7	38.9
3.51-4.00	4	22.2
Pre-university		
STPM	3	16.6
Matrix/ Foundation UiTM	3	16.6
Diploma from another institution of higher learning	1	5.6
Diploma UiTM	1	5.6
Final adoption of semester Diploma	10	55.6
Culinary internship		
Type of Hotel		
Resort	4	22.2
City Hotel	5	27.8
Boutique hotel	1	5.6
Hotel Star Rate		
3-star	3	16.6
4-star	5	27.8
5-star	2	11.1

Table 1 (continue)

Location of Internship		
Urban	5	27.8
Suburban	3	16.6
Island	2	11.1

Observation and Hands-on Activities

The process of observation took place once a week, for a four-hour session for each student, with a total of 72 hours of observation, which took six weeks to complete. Four themes of FHS were identified during the analysis of the footage and presented in Table 2.

Table 2
Themes of FHS

Themes	Never (0%)	Occasionally (1-50%)	Frequently (51-100%)
Wash theme			
a. Hands frequently			x
b. Knife before and after usage		x	
c. Test spoon before and after usage		x	
d. Food thermometer before and after usage		x	
e. Cooking utensils (spatula, thong) before and after usage		x	
f. Fruits and vegetables thoroughly			x
Clean theme			
a. Wear gloves	x		
b. Tabletops surface		x	
c. Chopping board		x	
d. Cap or scarf			x
e. Chef jacket			x
f. Kitchen pants			x
g. Apron			x
h. Kitchen towel			x
Use theme			
a. Different compartment for raw and cooked food			x
b. Color code chopping board		x	
c. Different knife for cutting raw and cooked food	x		
d. Thermometer when cooking meat, poultry and egg product		x	
e. Different kitchen towel to wipe dry especially wet surface		x	

Table 2 (continue)

Inspect theme	
a. Smell raw meat, poultry, seafood and dairy products before use	x
b. Raw items from foreign substances	x
c. Expiry date	x
d. Physical check on cans from dents and rust	x

FHS is usually associated with personal cleanliness and an efficient workplace. The systematic organisation of a workplace can minimise the transmission of an organism from raw to cooked food through hands, utensils, and clothes. Figure 1 shows that the participant has organised his workplace through concrete FHS implementation.



Figure 1. Picture of an organised workplace

Routine in the kitchen, can spread foodborne pathogen very efficiently. This study identifies several negative FHS implementation habits. Figure 2 and Figure 3 show the contrary implementation of FHS, which may lead to foodborne illness.



Figure 2. Picture of a student handling of raw chicken

Figure 2 indicates the student's use of the wrong colour code chopping board in handling the raw chicken. Preparing raw chicken has long been recognised as an important source contaminant of *Salmonella* spp. and *Campylobacter* spp. Handling contaminated raw chicken disperses pathogens throughout the kitchen, not just onto work surfaces and hands (Cogan, Bloomfield, & Humphrey, 1999).



Figure 3. Picture of a student handling of cooked product without gloves

DISCUSSION

Demographic Characteristics of Respondents

The demographic characteristics of 18 respondents are shown in Table 1. Most of the respondents were females (66.6%) compared to males (44.4%), with 61.1% of CPGA between 3.01 and 4.00. There were 10 (55.6%) respondents from culinary related programmes (private and government). It was learnt that 10 respondents (55.6%) had culinary internship experience, with half from city hotels and the rest from a 4-star urban hotel.

Food Safety and Hygiene Practice Implementation

This study presents insights into the implementation of FHS by monitoring culinary students' behaviours during a mock kitchen class. Food handlers and culinary students think that they know how to handle food safety, but their self-reported food handling behaviours do not support this assumption (Hassan & Dimassi, 2014; Saad, Abdullah, Jeinie, & Husain, 2016).

In eliminating the bias of students reacting abnormally because of the knowledge that they are being recorded, the researchers spent eight weeks on the site to make sure that the students involved in this study acted normally, as themselves. Based on the data from the study, it is found that students did not use gloves and only practised all purpose, single knife usage. Using gloves and having separate knife functions (vegetables, raw meat, seafood, and cooked food) may prevent cross contamination. Furthermore, using gloves and different knives for different purposes can avoid the transmission of foodborne pathogens, such as *E. coli*, *Listeria*, *Salmonella*, and others.

Meanwhile, this study also detected several potential activities that cause cross contamination. Even though 61.1% of the participants had a CGPA between 3.01 and 4.00, and 55.6% had a culinary internship with multi-background experience, the study indicated that students occasionally did not fully utilise or apply the knowledge they had learnt during theoretical classes, hands-on practical kitchen and industrial internship. Notably, these culinary interns had undergone the theoretical course of Food Safety Management (course code HTF533) in semester four. Abdullah Sani and Siow (2014) reported that there was a positive association between the level of knowledge, attitudes, and practices of food handlers; nevertheless, through the observations, it can be seen that many of them do not always apply the theoretical knowledge they have learnt in the actual practice of handling food.

Despite the numbers given above, the study reflects that on the whole, culinary students do not practice the actual implementation of FHS. A total of 27.8% of the students with culinary internship experience showed a remarkable implementation of FHS. This study identifies hotel star rating, as well as the location and type of hotel, as a contributor to the shaping of student behaviour of being efficient in FHS implementation. Hotels with a 5-star rating usually have well-developed FHS systems, such as the Halal certificate, GMP, or HACCP system, to secure their investment.

Indeed, a culinary internship with an established FHS system tends to improve students' behaviour regarding FHS implementation. FHS knowledge gained from any form of knowledge transfer (theoretical class, hands-on practical kitchen, and industry internship) require the students to use all available resources and initiatives to improve the implementation of knowledge into practical application. Therefore, sufficient knowledge transfer and consistent training efforts are needed to produce the next generation of food handlers.

CONCLUSION

This study offers a significant understanding of the implication of FHS among culinary students. Culinary students who have knowledge of FHS and culinary experience are highly cautious about FHS implementation. The impact of culinary internship significantly changes students' behaviours in terms of FHS implementation. Nevertheless, the impact will be more significant if the place of internship implements and establishes HACCP system, GMP, Halal certificate, or others related to FHS.

Therefore, effective FHS knowledge transfer and food safety training in selective industry criteria with proper guidelines should be introduced for all culinary schools to produce a competent workforce and to minimise the prevalence of foodborne hazards. Besides guidelines, this study recommends that a procedure be adopted to help students choose a suitable institution for their culinary internship. Indeed, hands-on activity needs intervention on rubric grading systems, which should include greater details of hygienic and safety practices to educate culinary interns.

It is acknowledged that there are also several limitations of this study. The data relied on the research setting, might have exhibited bias because the students may have reacted abnormally to the camera and picture taking during the process of observation. Attempts were made to compensate for this, and during the process of observation, the students were given

briefing and orientation time of 15 to 60 minutes to become comfortable and familiar before recording took place.

Further research is needed to assess FHS implementation in the industry, in hotels in Malaysia that practise HACCP, GMP, Halal certificate, or other FHS systems. Moreover, it would be worthwhile for future research to involve collaboration with government agencies such as the Ministry of Health or other related agencies as well as hotels to promote the effectiveness of the food safety study and identify suitable places for culinary internships. Indeed, by producing competent future chefs, such interventions will be game changing in reducing foodborne diseases.

ACKNOWLEDGEMENTS

This research was funded by Universiti Teknologi MARA (UiTM) grant no: 600-IRMI/MyRA 5/3/GIP (015/2017).

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