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Procedia - Social and Behavioral Sciences 201 (2015) 121 – 127

Procedia
Social and Behavioral Sciences

Asian Conference on Environment-Behaviour Studies, AcE-Bs2015, 20-22 February 2015,
Tehran, Iran

A Conceptual Model of Food Hygiene and Safety: Implication for future research

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Abstract

This study presents conceptual models that explain the food hygiene and food safety towards culinary student undergo the culinary internship. The respondents were among the culinary students during culinary internship. Both qualitative and quantitative techniques will use as systematic tools to test and validate the model. Through a series of descriptive and inferential statistic some meaningful insights on the issues of interest were obtained. Finding will reveal new dimensions of knowledge, attitudes and practice effects competencies in particular recognized as contributory factors that positively or negatively influenced the job performance of a future chef.

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Peer-review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers) and cE-Bs (Centre for Environment-Behaviour Studies, Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Malaysia).

Keywords: Food hygiene; food safety; competency; culinary internship

1. Introduction

Culinary program in higher education has significant roles in producing competent workforce. Culinary student will become a future food handler and contribute their body of knowledge, improving level food hygiene and safety in any food organization. Indeed researchers of food hygiene or food safety have often suggested cases of a foodborne outbreak may cause by incompetent food handler. Previous research by Abdul-Mutalib et al. (2012) identify the contribution of foodborne outbreak is lack of knowledge of food hygiene and safety during preparation,

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processing and storage lead to a violation of food hygiene and safety. Meanwhile, according to Abdullah Sani & Siow (2014), highlighted inadequate knowledge of food hygiene, food hygiene practice and practicing poor attitude in sanitation and food safety among food handler encourage to pathogen growth and lead to foodborne outbreak.

Food hygiene and safety training should be conducted to eliminate possible misleading regards to food hygiene and safety issues (Seaman, 2010). On behalf of that, this study will tackle culinary student as subject due on they have exposed on the theoretical aspect of food hygiene and safety during their study period. Within the knowledge of food hygiene and safety in the theoretical perspective they are assumed to be competent to finding the results of a new dimension on this particular issues.

Culinary internship is one of activity to expose culinary student to pursue professional chef career. According to Chen & Shen (2012), to pursue professional development through internship programs depends on performance evaluation of determinants student's willingness. Little is unknown to what extent the impact of food safety and performance evaluation after complete their culinary internship. Therefore, this study focuses on objective to assess food safety concern for the culinary student. The latter combined with confidence in their skills may diminish their performance of appropriate food safety practices during food preparation (Ovca, Jevšnik, & Raspor, 2014). It is necessary to apprehend the level of hygiene practice from culinary student as there are many significance gains while improving the health status and to pursue career development.

2. Literature review

2.1. Food hygiene

In general, poor food hygiene knowledge and frequently engage in unsafe food handling practice lead to foodborne illness. Study by Osaili et al. (2013) has revealed lack of knowledge of basics food hygiene including critical cooking and storage temperatures of food, cross contamination and personal hygiene within food handlers. It is necessary food handler to have responsibility for ensuring the production of safe foods, and their knowledge, attitudes and practice preventing from any food poisoning cases (Angelillo, 2000). Human handling errors have been responsible for most outbreak of foodborne illness.

In preventing human error, channeling hygiene knowledge through education may reduce the risk of foodborne illness. Gibson et al. (2002) suggest people who involved in providing, processing and service of meal required to involved with hygienic food preparation and the education. This demonstrates that the level of education is a significant factor in ensuring and main training appropriate food practices (Jianu & Chiş, 2012).

2.2. Culinary internship part of training

It is important that actual training to deliver appropriate knowledge is acquired and effectively applied. Without a well-trained personnel which realize the importance of hygiene rules in the food processing chain, implementing and maintaining a functional food safety system is a goal very difficult to achieve (Jianu & Chiş, 2012). The performing of safe food handling practices, learnt during food hygiene training, requires the food handler to use the resources available to them and implement the knowledge and skills into practical application (Green et al., 2005).

Student will be sent to various type of hotel, star rating, and location in achieving knowledge by professional chef. That student must complete their internship to earn their degrees. According to Cullen (2014), culinary internship can reinforce and help embed knowledge learned in the classroom environment. Culinary internship is part of the culinary program to produce competence workforce after their graduate. Indeed, training and education are essential to ensure that workers have the awareness and knowledge necessary to comply with food hygiene demands, although these do not always result in a positive change in food handling behavior (Seaman & Eves, 2008).

2.3. Competency develops performance

Knowledge, skills, and attitudes are needed to maintain the same or higher productivity with fewer people. Competency in the human resources field defined as a personal characteristic that can lead to higher performance

(Lustri, Miura, & Takahashi, 2007). Competence was categorized as the skills, knowledge and other attributes that result in success human resource capability (Johanson et al., 2010). Organizations use competencies in their human resources practices such as job analysis, recruitment and selection, training, career development, succession planning, and performance appraisal (Chung-Herrera & Lankau, 2003). Study by Lucia and Lepsinger (1999), have provided two importance reasons of competency models in a competitive environment. The first reason is to ensure that employees are doing the right things. Second, it has been suggested that competency models are most useful when efficiency is necessary for competitive advantage. They have noted that competition has also made it imperative for many companies to become fit if they are to survive.

3. Models

3.1. Existing theoretical models

Little academic research has been carried out on culinary internship on their food hygiene and safety which lead to performance. Because this research is aiming to develop an integrated food hygiene and safety, the study first analyzes the existing theoretical framework for this performance. Cua, Mckone & Schroeder (2006) develop a model (Fig. 1) that indicates the factors that influence practice influence performance.

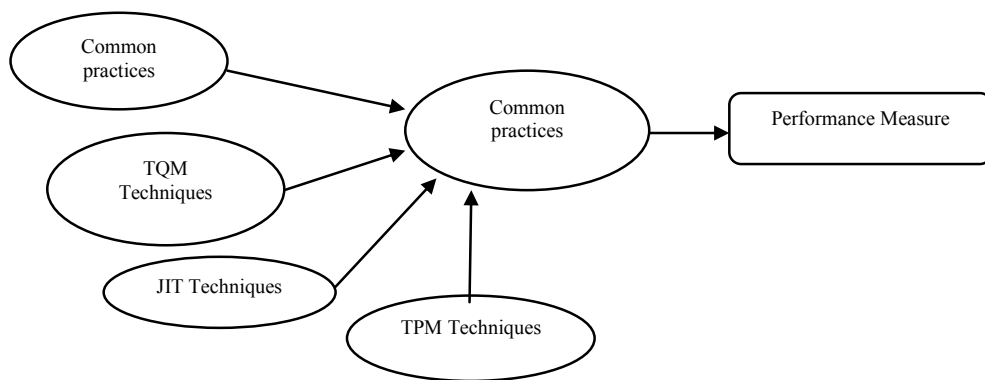


Fig. 1. Factor affecting practice and performance.

Source: Cua, Mckone & Schroeder, (2006)

Their model suggests that that there is no dominant factor that affect such a standard practices, total quality management techniques, just-in-time techniques and total productive maintenance techniques involves in measuring performance. Meanwhile, Ketokivi & Schoreder (2004) argue that ignoring the multidimensionality of operational performance and manufacturing goals lead to an incomplete understanding and modeling of the practice performance relationships (Fig. 2).

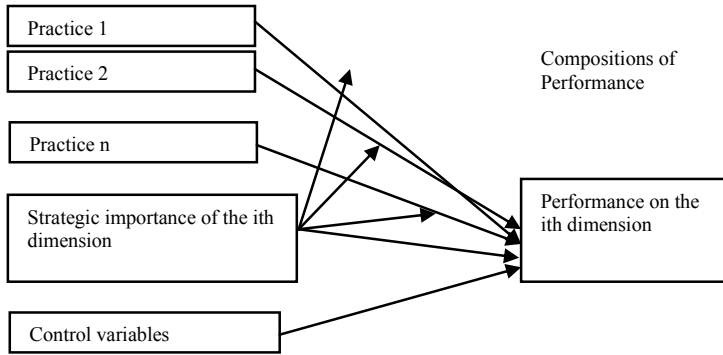


Fig. 2. Practices, strategic fit and performance.

Source: Ketokivi and Schroeder, (2004)

To provide a better understanding and also be helpful to investigate exactly which attitudes, behaviors or skill lead to greater success, Tischler, Biberman & McKeage (2002) develops possible explanatory models that for some certain elements are more important than for others, leading to broader list of element that are causal to success (Fig. 3). Based on the available data, they devised a model that describes the structure of achieving performance. There are a number of competencies that can lead to enhancing individual work success and can be developed. This study can result in the discovery of the most practical, effective, and efficient method of developing competencies for measuring performances base on culinary internship outcome.

Models	Explanations
$EI \rightarrow Performance$ $SI \rightarrow Performance$	Completely independent causal models
$EI \rightarrow Performance$ $SI \rightarrow Performance$	Linked causal model
$EI \rightarrow Performance$ $SI \rightarrow Performance$	Linked causal model with specified common elements
$EI \rightarrow SI \rightarrow Performance$ $SI \rightarrow EI \rightarrow Performance$ $? \rightarrow EI \text{ or } SI \rightarrow Performance$ $EI \text{ or } SI \rightarrow ? \rightarrow Performance$	Either a moderator or a mediator (intervening) variable causal model. Four possible options shown here
$EI \rightarrow Performance$ $SI \rightarrow Performance$	Only specified common elements are causes

Fig. 3. Possible explanatory models.

Source: Tischler, Biberman & McKeage, (2002)

3.2. Proposed integrated model of food hygiene and safety performance

This study will examine the foundation of culinary student knowledge, practice and attitudes on food safety issue in enhancing safety education program. With that intention, it is essential to finding the problem and closing the gap regarding food safety issue we proposed a conceptual models framework included food hygiene and safety, competency, culinary internship characteristic and performance outcome. We aim to consider each aspect of food hygiene and safety in our proposed intergraded model (Fig. 4) which is general enough to and could accommodate different type of food hygiene and safety (e.g in workstation and work habit of total behavioral of culinary student construct with food hygiene and safety issue). With the certain level of knowledge, practice and attitude of chef competency toward food hygiene will contribute significant changing towards any foodborne outbreak prevention and producing competent student for industry requirement.

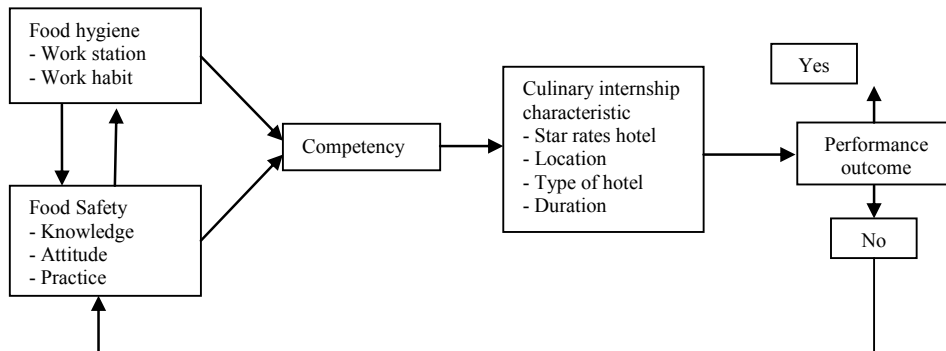


Fig. 4. Proposed food hygiene and safety on culinary internship performance models.

Regardless sufficient training among culinary student required before their becoming food handler. Research by Abdullah Sani & Siow (2014) has emphasized effectiveness, and compulsory food safety training on regular and ongoing basis should be conduct to eliminate possible misleading regards to food safety issues. As future food handler, this culinary student shall close the gap from others research that touch food safety issues to minimize the prevalence of foodborne hazards. Study by Abdullah Sani & Siow (2014) and Ansari-Lari, Soodbakhsh, & Lakzadeh (2010) has reported that the food handler has inadequate knowledge about microbial hazards with disease-causing agents that lead to foodborne hazards. The practices of food handlers are distressing to note in food service establishment in the future that continue to compromise.

4. Methodology

In order to assess the level of food hygiene and safety, the unit analysis of this research was at individual level. The targeted population were culinary student that already done their culinary internship. The tools used to gather information for the objective of this study were through observation and self-rated questionnaire survey. An observation method also will be employed in this study. Observation is defined as the systematic description of events and behavior in the social setting. Besides, observation method was used when the intent to provide a detailed, as well as an in-depth description of behavior and practice. The surrounding or the study was observed from the point of view of the subject that means in this study, the participant acted as the subject. Furthermore, there are two major types of observation study will be apply in this research that are observations and video recording. The observations made and followed by picture raking that were applied in this research were used in order to tap on the real behaviour pertaining in food hygiene and food safety practices. Participant observation were made from an engagement in kitchen. This is one of primary sources of observation data.

In the quantitative section, this research applied descriptive statistics to provide a feel of the raw data in describing the characteristic of the sample. For this purpose, statistics including frequencies, percentages, maximum, minimum, range, modes, medians, mean and standard deviations were computed for demographics variables (respondent personal profile). The data collected were processed and analyzed using SPSS version 23.0. Specifically, the SPSS tools utilized in this research as descriptive data, factor, and reliability analyzes. In this study, the mean scores were used for the assessment of food hygiene and safety level of the culinary student.

5. Implications and directions for further research

Knowledge of food safety, food hygiene practice and food sanitation and safety attitudes align with job performance. These KAPs believed can enhance job performance in line with the job specification. To close highlighted literature gaps. Studies by Ansari-Lari, Soodbakhsh, & Lakzadeh, (2010) and Abdullah Sani & Siow, (2014) have shown lack of knowledge of pathogen associated with microbial food hazard and poor practices towards food safety practice. While both studies are focusing on food handler and random student, meanwhile this study will focus on culinary student who had done industry attachment during their study. This study will like to close the gap by conducting triangulation method that consist semi-structure interviews, microbiological analysis, and questionnaire survey. Competency is a driving factor to influence performance. It begins with the empirical study of possible significant relationship between food hygiene, food safety, the KAPs, competency, and performance.

6. Conclusion

This study intends to provide answers to the research setting, therefore, identify the correct methodology is crucial for empirical finding. Anyhow, this study expects to Assessment knowledge of food safety, food hygiene practice and food sanitation and safety attitude among culinary student after undergo industry attachment. This is involving of their social demographic as moderating effect and chef competency as intervening effect on assessing KAPs level among the students. In this study context chefs, retention is conceptualized as a perceived in terms of performance of the chefs towards their individual goal.

Acknowledgements

This research was fund by Mybrain15 under Ministry of Education Malaysia through the Faculty of Health Sciences, Universiti Teknologi MARA.

References

- Abdul-Mutalib, N.-A., Abdul-Rashid, M.-F., Mustafa, S., Amin-Nordin, S., Hamat, R. A., & Osman, M. (2012). Knowledge, attitude and practices regarding food hygiene and sanitation of food handlers in Kuala Pilah, Malaysia. *Food Control*, 27(2), 289–293.
- Abdullah Sani, N., & Siow, O. N. (2014). Knowledge, attitudes and practices of food handlers on food safety in food service operations at the Universiti Kebangsaan Malaysia. *Food Control*, 37, 210–217.
- Angelillo, I. F., Viggiani, N. M. A., Rizzo, L., & Bianco, A. (2000). Food handlers and foodborne diseases: knowledge, attitudes, and reported behavior in Italy. *Journal of Food Protection*, 63, 381–385.
- Ansari-Lari, M., Soodbakhsh, S., & Lakzadeh, L. (2010). Knowledge, attitudes and practices of workers on food hygienic practices in meat processing plants in Fars, Iran. *Food Control*, 21(3), 260–263.
- Cua, K. O., McKone, K. E., & Schroeder, R. G. (2001). Relationships between implementation of TQM, JIT, and TPM and manufacturing performance. *Journal of Operations Management*, 19(6), 675–694.
- Chen, T.-L., & Shen, C.-C. (2012). Today's intern, tomorrow's practitioner?—The influence of internship programmes on students' career development in the Hospitality Industry. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 11(1), 29–40.
- Chung-herrera, B. G., & Lankau, J. (2003). Grooming future hospitality leaders: a competencies model, Cornell Hotel and Restaurant Administration Quarterly, 17–25.
- Cullen, F. (2010). Phenomenological Views and Analysis of Culinary Arts Student Attitudes to National and International Internships: The "Nature of Being" Before, During, and After International Internship. *Journal of Culinary Science & Technology*, 8(2-3), 87–105.

- Cunningham, A. E., Rajagopal, R., Lauer, J., & Allwood, P. (2011). Assessment of hygienic quality of surfaces in retail food service establishments based on microbial counts and real-time detection of ATP. *Journal of Food Protection*, 74(4), 686-690
- Lahou, E., Jaccsens, L., Daelman, J., Van Landeghem, F., & Uyttendaele, M. (2012). Microbiological Performance of a Food Safety Management System in a Food Service Operation. *Journal of Food Protection*, 75(4), 706-716.
- Lucia, A. D., & Lepsinger, R. (1999). The art and science of competency models: Pinpointing critical success factors in organizations. *San Francisco: Jossey-Bass/Pfeiffer*.
- Lustri, D., Miura, I., & Takahashi, S. (2007). Knowledge management model: practical application for competency development. *The Learning Organization*.
- Gibson, L. L., Rose, J. B., Haas, C. N., Gerba, C. P., & Rusin, P. A. (2002). Quantitative assessment of risk reduction from hand washing with antibacterial soaps. *Journal of Applied Microbiology*, 92(1), 136e143.
- Green, L. R., Radke, V., Mason, R., Bushnell, L., Reimann, D. W., Mack, J. C., et al. (2007). Factors related to food worker hand hygiene practices. *Journal of Food Protection*, 70, 61-666.
- Jianu, C., & Chiş, C. (2012). Study on the hygiene knowledge of food handlers working in small and medium-sized companies in western Romania. *Food Control*, 26(1), 151-156.
- Johanson, M., Ghiselli, R., Shea, L.J., Roberts, C. (2010). Revealing key competencies of hospitality graduates demanded by industry: a 25-year review. *Refereed paper presented at the 2010 International CHRIE conference*.
- Ketokivi, M., & Schroeder, R. (2004). Manufacturing practices, strategic fit and performance. *International Journal of Operations & Production Management*, 24(2), 171-191.
- Osaili, T. M., Obeidat, B. A., Abu Jamous, D. O., & Bawadi, H. A. (2011). Food safety knowledge and practices among college female students in north of Jordan. *Food Control*.
- Ovca, A., Jevšnik, M., & Raspor, P. (2014). Food safety awareness, knowledge and practices among students in Slovenia. *Food Control*, 42, 144-151.
- Saad, M., See, T. P., Abdullah, M. F. F., & Nor, N. M. (2013). Use of Rapid Microbial Kits for Regular Monitoring of Food-contact Surfaces towards Hygiene Practices. *Procedia - Social and Behavioral Sciences*, 105, 273-283.
- Saad, M., See, T. P., & Adil, M. A. M. (2013). Hygiene Practices of Food Handlers at Malaysian Government Institutions Training Centers. *Procedia - Social and Behavioral Sciences*, 85, 118-127.
- Seaman, P. (2010). Food hygiene training: Introducing the Food Hygiene Training Model. *Food Control*.
- Tischler, L., Biberman, J., & McKeage, R. (2002). Linking emotional intelligence, spirituality and workplace performance. *Journal of Managerial Psychology*, 17(3), 203-218.