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An Interdisciplinary Collection of Managerial Research Findings and Breakthroughs

Edited by
Mehran Nejati

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Food Safety Knowledge and Practices of Hospitality Management Students: A Questionnaire-Based Study in Turkey

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Abstract
The aim of this study is to review the hospitality management departments students knowledge of food safety, their attitude towards safe food production and the adequacy of their levels of personal hygiene. In order to complete this task, 196 hospitality management students studying tourism at one Turkish university were put to a survey. The results of this survey indicate that the hospitality management students lack the correct knowledge in regards to food safety but their attitude towards safe food production was found to be positive and their levels of personal hygiene were found to be adequate.
Key words: Hygiene, food safety knowledge, hospitality management students, Turkey

1. Introduction

Each year, millions of people worldwide suffer from food-borne diseases and illnesses resulting from the consumption of contaminated food, which has become one of the most widespread public health problems in the contemporary world (Sanlier, 2009; Giritlioglu et al., 2011). Analyses of food-borne disease records throughout the world have shown that the majority of outbreaks result from bad practice during food preparation in small food businesses, canteens, residential homes and other places where food is prepared for human consumption (Seaman and Eves, 2006). Food safety requires proper handling from production through to consumption for catering (Bruhn and Schutz, 1999) and food and beverage departments of hospitality establishments. Food handlers have a major role in the prevention of food poisoning during food production and distribution (Walker et al., 2003). It is emphasized in some studies that the level of personnel education is an important element in safe food production (Ehiri et al., 1997; Egan et al., 2007; Çakýroglu and Uçar, 2008; Pilling et al., 2008). Cohen et al. (2001) stated that "only knowledgeable, motivated and skilled employees who are trained to follow the proper procedures together with management that effectively monitors employees' performances can ensure food safety" (Lin and Sneed, www.fsmec.org).

The students that receive hospitality management education are best suited for hospitality and catering establishments. These students will be working as either food production personnel or hospitality managers after graduating from university. The students' knowledge of food safety and their attitude towards safe food production and personal hygiene practices are extremely important. When reviewing related literature, we found that there have been many studies regarding the knowledge and practices of food safety and hygiene which have been conducted on various industry groups such as food handlers (Walker et al., 2003; Jevsnik, 2008a), streetfood vendors (Azanza et al., 2000; Omemu and Adereju, 2008), hospital food and beverage staff (Angellilo, 2001; Tokuç et al., 2009), restaurant operators (Yantis et al., 1996), head chefs and catering managers (Bolton et al., 2008), cookery students (Giritlioglu et al., 2011) and consumers (McCarthy et al., 2007; Jevsnik et al., 2008b; Sanlier, 2009). However, we have yet to come across a study which has examined the knowledge and use of food safety and hygiene practices among students studying at the undergraduate level of hospitality management. This point increases the importance of our study.

2. Materials and Methods

A questionnaire form was designed to collect the data for this study. Initially the questionnaire was pre-tested on 22 randomly selected students, all of whom were working in the food and beverage departments of different hotel enterprises in Turkey. The questionnaire form was then rearranged according to pre-test results and other recommendations (The pre-test results are not included in this study). The data used in this study was collected from the hospitality management students with the help of instructors between the 19th of April and the 23rd of April, 2010.

The questionnaire form was designed taking the studies conducted by Angellilo et al. (2001); Walker et al. (2003); Çakýroðlu and Uçar (2008); Tokuç et al. (2009) and Giritlioglu et al. (2011) into consideration. The questionnaire form used in the survey consists of four parts. In the first part, 4 questions were asked to determine the students' socio-demographic characteristics (gender, age, class and whether or not an internship had been completed at an enterprise.). In the second part of the form, 15 questions were asked to determine the students' knowledge of food safety. To answer these questions, three choices were offered to the students: "True", "False" and "I do not know". In the third part, 7 questions, each with three options for an answer, were put to the students to determine their attitude towards safe food production. The choices for an answer were "I Agree", "I do not agree" and "I have no idea." They were asked to choose the correct answer based on their existing knowledge. In the fourth part of the questionnaire, 3 questions were asked to determine the level of personal hygiene practices of the students. They were asked in each question to choose from 5 options, including "always," "often," "sometimes," "rarely" and "never."

The full survey was completed by students studying in the hospitality management departments of 52 tourism schools at Universities in Turkey. However, this study comprises the data collected from students who are

studying in the hospitality management department of the one school which provides tourism education at undergraduate level. Questionnaire forms, which were prepared after the pre-tests, were delivered to 201 students. The delivered questionnaire forms were then collected. Five forms were left out of assessment since they were not properly completed. In this study, the number of questionnaire forms used in the assessment is 196.

3.Findings

The findings section comprises of four parts. The first part includes the students' socio-demographic profile information. The second part includes the results found in regards to the students' knowledge of food safety. The third part shows the students' behaviour towards safe food production and the fourth part displays the students' levels of personal hygiene practice.

3.1.Socio-demographic findings of the students

The students socio-demographic profiles are shown in Table 1. According to Table 1, 54.4% of the students are male and 45.6% of the students are female. The table shows that 33.8% of the students are aged 23 and above; 30.3% are 22 years old; the remaining 35.9% are 21 and below. It is also of note that 36.9% of the students are seniors and 83.5% of the students performed their internships at catering and hospitality enterprises.

3.2.Findings in relation to the students knowledge of food safety

Findings in relation to the students' knowledge of food safety are shown in Table 2. According to the table, only 23.6% of the students are aware that salmonella is a food-borne bacterium. The remaining 68.2% were unaware. In regard to hot ready-to-eat food, 41.3% of students questioned thought that it should be kept at 20° C, while only 22.5% of the students knew that such food should not be kept at 20° C.

The students' knowledge of proper defrosting techniques was also low. Only 19.9% were aware that meats should not be defrosted at room temperature. The majority of students, 61.2%, were aware that defrosted meat should not be refrozen. However, 30.1% thought that it was acceptable to repeatedly refreeze and defrost meats and 8.7% answered that they did not know either way.

The possibility of bacterial contamination of raw food by human hands was another area in which the students lacked knowledge. Only 58.7% of the students were aware of this possibility; 20.4% were under the impression that humans can not contaminate food with bacteria transferred by hand; and 20.9% didn't know either way. Table 2 also shows that 63.3% of the students disagree that bacteria die at body temperature, whereas 9.1% agree and 27.6% did not know either way.

The percentage of students that are aware of room temperature storage times for cooked foodstuff was also low. Only 28.1% of the students knew that cooked foodstuff should not be left out for more than 5 or 6 hours before being refrigerated; 57.7% of the students stated that it was acceptable to do so; and 14.2% did not know either way. Although those percentages were low, 69.9% of the students knew cooked and raw foodstuffs should not be kept in the same place and 70.4% of the students were aware that meats and vegetables should not be prepared on the same preparation board. Despite the higher percentages of correct answers shown here, it is thought that overall these scores are not adequate for hospitality management students.

3.3.The students attitude towards safe food production

The findings shown in Table 3 display the students' attitudes towards safe food production. According to the table, 93.4% of the students stated that personal hygiene is an important factor in their profession. Eighty two point seven per cent of them indicated that no food should be prepared when wearing rings, tags or jewellery. Moreover, 83.7% of the students stated that a glove should be worn in order to make food production more hygienic. The majority of students, 83.1%, stated that food should be stored and transported in safe, hygienic containers to reduce the chance of contamination. Furthermore, most of the students (77.1%) think that a person who has a cold or flu should not participate at all in food production. Finally, the percentage of students who think that food production personnel with cuts and/or open wounds on his/her hand should not participate in food production is 79.6%. In general, the students' attitudes towards safe food production is encouraging.

3.4.Findings in relation to the students' levels of personal hygiene practice

The findings in relation to the students' levels of personal hygiene are shown in Table 4. According to the table, In regard to the washing of hands after using toilet, 81.7% of the students stated that they always did so; 12.2% that they often did so; and 6.1% that they did so sometimes. In regard to the washing of hands after sneezing, 63.8% stated that they always did so; 25.5% that they often did so; 5.1% said sometimes did so. A small portion of students, 24%, indicated that they always brushed their nails, while 14.8% of them indicated that they never brushed their nails. It is clear that although, it is one of the most important aspects of personal hygiene, the students take less care with nail brushing than any in other area of personal hygiene .

4. Discussion

Due to a lack of existing published literature (Angellilo et al., 2001; Walker et al., 2003; Çakýroðlu and Uçar, 2008; Tokuç et al., 2009; Giritlioglu et al., 2011) we have endeavored to discover the level of knowledge of food safety possessed by undergraduate students in hospitality-management, their attitude towards safe food production and the adequacy of their

levels of personal hygiene. This study was implemented on hospitality management students who will be employed in the food industry in the future.

The Salmonella bacteria causes a large number of food-borne diseases in today's world (Tietjen and Fung, 1995 and Dunkley et al., 2009). It is extremely active and can survive on finger tips and other surfaces for varying periods of time (Omemu and Aderoju, 2008). In our study, most of the hospitality management students were unaware of the possible presence of Salmonella, despite this bacterium playing a major role in food-borne diseases. This does not coincide with studies already performed. In the study done by Ehiri et al. (1997), it was found that most of the students who take a food hygiene course know of this bacteria. Likewise, in the study performed by Angellilo et al (2001) on the employees working in food-beverage departments at the hospitals of Italy, it was found that 99,7% of the personnel were aware of salmonella.

As indicated in most of the performed studies, ready-to-eat food intended for continuous serving should be kept at 60 °C (Angellilo et al., 2001; Omemu and Aderoju, 2008; Giritlioglu et al., 2011). In the results of the present study, it was found that a significant ratio of the students did not know at what temperature ready-to-eat food should be kept. These results are parallel with findings regarding food handlers in other studies (Angellilo et al., 2001; Walker et al., 2003).

We also found that more than a quarter of the students were not familiar with the way bacteria behaves at normal body temperature. Bacteria multiply faster at body temperature (Giritlioglu et al., 2011) and 26.5% of our sample did not know this. This finding is similar to that in a study of Walker et al. (2003). Concerning food handlers in several food enterprises in the United Kingdom, the study discovered that 11% of them thought that bacteria did not multiply more rapidly at body temperature and that 13% of them did not know either way.

It was also determined that students lack sufficient knowledge on the correct way to defrost meat. Foods should never be defrosted on the counter, or in hot water as bacteria multiply rapidly between 40 and 140 °F (4 - 60 °C). There are three safe ways to defrost food: in the refrigerator (approx. full day to thaw), in cold water (approx. an hour by changing the water every 30 minutes), and in the microwave (Food Safety and Inspection Service, www.fsis.usda.gov). There are also quite a number of students who think that the most ideal method for defrosting meat is for it to be left out at room temperature. This is in keeping with the results of another study where almost half of the cookery students believed that frozen meat should be defrosted at room temperature (Giritlioglu et al., 2011). In a study Bolton et al. (2008) conducted on cuisine chiefs in Ireland, they determined that 19% of the chiefs defrosted the meat at room temperature. And in a study Jevsnick et al. (2008b) conducted on consumers in Slovenia, they indicated that almost 50% of the consumers defrosted the meat on a counter at room temperature.

Another point where the students' knowledge of food safety can be considered low is in their allowing the storage of cooked and raw food in the same place. Raw and cooked food should not be stored together under any circumstances (Angellilo et al., 2001). However, almost one third of the students have wrong information, or are otherwise ignorant on this matter.

In our study, it has been shown that despite the deficiencies in the students' knowledge of food safety, they have adequate knowledge of safe food production. This finding is similar to that in a study conducted by Tokuç et al. (2009) on food handlers in hospitals. It was found by them that despite the food handlers' lack of knowledge in food safety, their knowledge of safe food production was sufficient.

A large part of the students think that personal hygiene is important for their profession, and also that jewellery such as rings and earrings should not be worn during food production. As indicated by Omemu and Aderoju (2008), when jewellery such as rings and necklaces are worn during production, they become significant factors in contributing to the contamination of food with bacteria. Likewise, a majority of the students think that the production staff should wear gloves during food production to avoid contamination. This is corroborated by a study conducted by Giritlioglu et al. (2011).

Production personnel should not be directly involved in food or beverage production when they have got flu or are sick (Azanza et al., 2000; Çakýroglu and Uçar, 2008). We notice that the majority of students in our study share these thoughts. In the study conducted by Azanza et al. (2000), it was found that 70% of the street vendors in the Philippines knew that they should not be involved in food production when they were sick or had cuts, scrapes or open wounds on their hands. Also, Çakýroðlu and Uçar (2008) suggest that an employee should be prohibited from working in food production when he / she has got any kind of infectious disease.

In this study, it was evidenced that the students' personal hygiene practices were adequate. Moreover, these findings seem to be parallel with the findings of different groups in the existing literature (Angellilo et al., 2001; Giritlioglu et al., 2011). However, we have found at least one deficiency in the practices of personal hygiene by the students. The area which they pay the least attention to is nail brushing, where almost 15% of students said they never brushed their nails. This finding was corroborated in a study by Giritlioglu et al. (2011), where it was also found that cookery students pay little attention to this aspect of personal hygiene.

5. Conclusions

In order to lower the incidences of food-borne diseases, it is an important step to identify the knowledge and practices of the staff who shall be working in the food sector (Çakýroglu and Uçar, 2008). In the result of a

study conducted by Þanlýer (2009) on the food safety knowledge of young and mature consumers, she stated that food safety and hygiene training should not only be given to consumers but also be provided to the directors and staff working in a food-beverage production enterprise. Taking heed from this study, we measured the knowledge of food safety of the students who will be working in food-beverage departments of the hospitality sector and catering industry and tried to expose their level of knowledge in this field. In the results of the study we conducted, we showed that the students' knowledge of food safety had serious deficiencies, while their attitude towards safe food production and personal hygiene was at an acceptable level.

The most important aim of the hospitality management department at the level of bachelor degree is to develop skilled labour needed by the tourism sector in Turkey and prepare them for work in hospitality and catering enterprises. Students graduating from this department should be able to take charge directly in food-beverage units of hospitality enterprises and catering firms, as well as to be in charge of food-beverage production management. After considering the students' low level of knowledge in regard to food safety as determined by this study, we think that students should be provided with an immediate food safety training course. Failing to educate the students appropriately in this area will result in poor levels of food hygiene and ultimately, financial loss in the tourism sector.

6. Limitations of this study and directions for future research

Like many other studies of this nature, ours has some limitations. The most obvious is that the study was implemented in only one school in Turkey. In future studies, we hope it will be possible to increase the number of sample schools and sample student amounts. Another limitation might have arisen from the use of a questionnaire to assess the students' knowledge and practices. The observation method might better used in subsequent studies to assess the students' practices in food hygiene.

As for future studies, other evaluations may be useful: Of the knowledge of food safety and the hygiene practices of students in hospitality management; of employees working in tourism and catering enterprises; and finally, of students in the two-year license program of the department of hotel, restaurant and traveling services.

References

1. ANGELILLO, F., VIGGIANI, N.M.A., GRECO, R.M. & RITO, D. (2001). HACCP and Food Hygiene in Hospital: Knowledge, Attitudes, and Practices of Food-Services Staff in Calabria, Italy, Infection Control and Hospital Epidemiology, 22(6):1-7.

2.AZANZA, P.V., GATCHALIAN, C.F. and ORTEGA, M.P. (2000). Food Safety Knowledge and Practices of Streetfood vendors in a Philippines University Campus, International Journal of Food Science and Nutrition 51:235-246.

3.BOLTON, D.J., MEALLY, A., BLAIR, I.S., MCDOWELL, D.A. & COWAN, C. (2008). Food Safety Knowledge of Head Chefs and Catering Managers in Ireland, Food Control, 19:291-300.

4.BRUHN, C. & SCHUTZ, H. (1999). Consumer Food Safety Knowledge And Practices, Journal of Food Safety, 19:73-87.

5.ÇAKIROĐLU, F. P. & UÇAR, A. (2008). Employees' Perception of Hygiene in the Catering Industry in Ankara, Food Control, 19:9-15.

6.DUNKLEY, K.D., CALLAWAY T.R. CHALOVA V.I., McREYNOLDS, J.L., HUMEÝ M.E., DUNKLEY C.S., KUBENA L.F., NISPET D.J. & RÝCKE, S.E. (2009). Foodborne Salmonella Ecology in the Avian Gastrointestinal System Tract, Anaerobe, 15 (1), 26-35

7.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, 18:1180-1190.

8.EHIRI, J.E., MORRIS, G.P. & MCEWEN, J. (1997): Evaluation of a Food Hygiene Training Course in Scotland, Food Control, 8(3):137-143.

9.FOOD SAFETY AND INSPECTION SERVICE, United States Department of Agriculture, Retrieved from http://www.fsis.usda.gov/factsheets/Big_Thaw/index.asp in 22.09.2010.

10.GIRITLIOGLU, I., BATMAN O., and TETÝK N (2011). The Knowledge and Practice of Food Safety And Hygiene of Cookery Students in Turkey, Food Control, 22 (6): 838-842

11. JEVSNICK, M., HLEBEC, V. and RASPOR, P. (2008a). Food Safety Knowledge and Practices among Food Handlers in Slovenia, Food Control, 18:1107-1118.

12. JEVSNICK, M., HLEBEC, V. & RASPOR, P. (2008b): Consumers' Awareness of Food Safety From Shopping to Eating, Food Control, 19:737-745

13. LIN and SNEED, "University Foodservice Employees' Food Safety Knowledge, Attitutes, Practices and Training", www.fsmec.org/pdf/JFSR&E_Manu script_ 2004002.pdf (10.04.2009).

14. MCCARTHY, M., BRENNAN, M., KELLY, A.L., RITSON, C., DE BOER, M. & THOMPSON, N. (2007). Who is at Risk and what do They Know? Segmenting a Population on Their Food Safety Knowledge, Food Quality and Preference, 18:205-217.

15. OMEMU, A.M. & ADEROJU, S.T. (2008). Food Safety Knowledge and Practices of Street Food Vendors in the City of Abeokuta, Nigeria, Food Control, 19:396-402.

16. PILLING, V.K, BRANNON, L.A., SHANKLIN, C.W., HOWELLS, A.D. & ROBERTS, K.R. (2008): "Identifying Specific Beliefs to Target to Improve Restaurant Employees' Intentions for Performing Three Important Food Safety Behaviors", American Dietetic Association, 108(6):991-996.

17. SANLIER, N. (2009). The Knowledge and Practice of Food Safety by Young and Adult Consumers, Food Control, 20, 6, 538-542

18. SEAMAN, P. & EVES, A. (2006). The Management of Food Safety-The Role of Food Hygiene Training in the UK Service Sector, Hospitality Management, 25: 278-296.

19. TIETJEN, M. & D., FUNG, Y.C. (1995). Salmonellae and Food Safety. Critical Reviews in Microbiology. 21 (1), 53-83.

20. TOKUÇ, B., EKUKLU, G., BERBEROĐLU, U., BÝLGE, E. & DEDELER, H. (2009) Knowledge, Attitudes and Self-reported Practices of Food Service Staff Regarding Food Hygiene in Edirne, Turkey, Food Control, 20(1), 565-568.

21. WALKER, E., PRITCHARD, C. & STEPHEN, F. (2003). Food Handlers' Hygiene Knowledge in Small Food Businesses, Food Control, 14: 339-343.
22. YANTIS, D.C., BELO P., GIAMPAOLI, J & MCPROUD L.(1996). Attitudes And Knowledge of Food Safety Among Santa Clara County, California Restaurant Operators, Journal of Foodservice Systems, 9 (1), 117-128.

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Table 1: Socio-Demographic Profile of Students

	Frequency	Percentage
Gender		
Male	106	54.4
Female	89	45.6
Total	195	100
Age		
18	4	2.1
19	11	5.6
20	25	12.9
21	30	15.3
22	59	30.3
23 and Above	66	33.8
Total	195	100
Education Level		
First Year	40	20.5
Second Year	52	26.7
Third Year	31	15.9
Fourth Year	72	36.9
Total	195	100
Has an internship been completed?		
Yes	162	83.5
No	32	16.5
Total	194	100

Table 2. Students Knowledge Concerning Food Safety

	True		False		Do not Know	
	n	%	n	%	n	%
Salmonella is a kind of bacterium which causes food poisoning	**46**	**23.6**	16	8.2	134	68.2
Hot ready-to-eat food should be conserved at 20 °C	81	41.3	**44**	**22.5**	71	36.2
There's no harm in eating cooked and refrigrated food if heated correctly.	19	9.7	**161**	**82.2**	16	8.1
Frozen meat should be defrosted at room temperature.	123	62.8	**39**	**19.9**	34	17.3
Meat, which has been frozen and then defrosted should not be re-frozen and defrosted again.	**120**	**61.2**	59	30.1	17	8.7
Pasteurized milk may be kept in the refrigerator for two weeks after it's opened.	25	12.8	**138**	**70.4**	33	16.8
Food can be contaminated with bacteria carried by hand.	**115**	**58.7**	40	20.4	41	20.9
Bacteria die at body temperature.	18	9.1	**124**	**63.3**	54	27.6
The bacteria which cause food-borne poisoning are only carried by ill people.	35	17.8	**115**	**58.7**	46	23.5
Bacteria slows down at 37 °C (body temperature)	88	44.9	**52**	**26.5**	56	28.6
Meat, chicken and fish can be kept in the same container.	31	15.8	**153**	**78.1**	12	6.1
Fish meat is extremely perishable.	**136**	**69.5**	41	20.9	19	9.6
Cooked foodstuff can be kept 5 to 6 hours at room temperature without being placed in refrigerators.	113	57.7	**55**	**28.1**	28	14.2
Cooked and raw food can be kept in the same place together.	30	15.3	**137**	**69.9**	29	14.8
Meat can be chopped up with vegetables on the same preperation board.	39	19.9	**138**	**70.4**	19	9.7

* The correct answers to items are given in bold type.

Table 3. The Students Attitude Towards Safe Food Production

	Agree		Not Agree		No Idea	
	n	%	n	%	n	%
Personal hygiene is very important for my profession	183	93.4	8	4.0	5	2.6
Foodstuffs should not be prepared whilst wearing rings, tags, or jewellery.	162	82.7	20	10.2	14	7.1
I use disposable paper towels for better hygiene during food production.	164	83.7	21	10.7	11	5.6
Gloves should be worn for more hygienic food production.	164	83.7	32	16.3	-	-
Suitable containers are used to store and transport food stuff to reduce the risk of contamination.	163	83.1	18	9.2	15	7.7
A person with a cold or flu should not be included in food production.	151	77.1	25	12.7	20	10.2
One should not touch foodstuff when he/she has cuts or scars on his/her hand.	156	79.6	25	12.8	15	7.6

Table 4. Students Practices in Personal Hygine

	Never		Rarely		Sometimes		Often		Always	
	n	%	n	%	N	%	N	%	n	%
How often do you wash your hands after using the-toilet?	-	-	-	-	12	6.1	24	12.2	160	81.7
How often do you wash your hands after coughing or sneezing?	-	-	11	5.6	10	5.1	50	25.5	125	63.8
How often do you brush your nails?	29	14.8	22	11.2	43	21.9	55	28.1	47	24.0