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Assessment of students' attitude and knowledge about food safety and hygiene in Isfahan University of Medical Sciences

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ABSTRACT

Food Safety and Hygiene (FSH) is defined as the proper degree of assurance that food will not cause sickness when it is served by the consumer. The objective of the current study was to assess the attitude and knowledge concerning with FSH among the students of Isfahan University of Medical Science (IUMS). This cross-sectional study was conducted in IUMS in 2018. Data were collected using a valid and reliable questionnaire on 331 students of IUMS who were selected through a stratified random sampling. In concerning with FSH and washing hands before food cooking; students had high attitude more than 79% and 65%, respectively. Also, participants had low attitude on other items (more than 60%). Besides, almost 99% of students had high knowledge about production and expiration date of food products. About 73% of students had lower knowledge about keeping bread in the refrigerator. Results revealed that there was a significant difference (p=0.01) between students' attitude and taking courses related to food safety and hygiene and year of university entrance (p=0.02). Furthermore, there was a substantial difference (p=0.02) between students' knowledge and their Field of study. Results showed that there was a focal point for imparting FSH education between students in order to increase their knowledge and attitudes level. Therefore, it is necessary to exactly determine how education and training may result in diminution in foodborne disease risk.

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1. Introduction

Foodborne disease is a public health problem around the world. Food Safety and Hygiene (FSH) is defined as the proper degree of guarantee that food when is handled, stored, prepared and served or eaten by consumer does not cause disease. The food related diseases are public health problem, both in developed and in developing countries (1-3). Therefore, safety of food continues to be of a predominant importance for not just consumers and also the perfect regulatory authorities and food industry. It was reported that every year 325000 people were hospitalized of which 5000 died from 76 million cases of disease in the United States (4,5). According to a literatures published by the Health Ministry, Kingdom of Saudi Arabia in the year of 2013 has been reported around 1647 food-borne

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disease. In another study, in 2011, 255 cases for food borne illness were reported causing disease in 2066 people. The outbreak of foodborne diseases is at times attributed to inappropriate handling of the items relevant to food usage at consumers' homes (6,7). The mistake in handling of food can happen during preparation, processing, packaging, storage and distribution of foodstuff (8,9). Several studies have indicated that mishandling of food occurs because of consumers have inadequate knowledge and attitude about food storage principle (10,11). Therefore, educating the consumers played a significant role in the prevention and control of food borne disease (12). Numerous studies have addressed that food handlers and consumer's knowledge and attitude is insufficient about FSH (13). According to studies the proper food storage and preparation practices are applied can prevent Foodborne illness (14,15). Recently, food safety knowledge and attitude among universities' students have been studied. Recent studies showed positive correlation between college status, knowledge and attitude toward FSH (7,16). Moreover, In Turkey it was reported that more than 50% of students did not have knowledge that checking the inner temperature of food is the safest path to determine if meat is properly cooked (17,18). In addition, it was illustrated that students with high knowledge of food safety had better reported practices, but even these students reflected some high-risk behaviors and weak attitude. The results of several studies have been reported that students are mainly concerned with food safety issues that threaten their health for foodborne disease (19-21). It has been noted that students of medical sciences have an important role in Iranian health system concerning to prevention of numerous diseases, particularly food related diseases. Therefore, their attitude and knowledge towards food safety and hygiene should be considered. According to recent literature results, there is no study on the evaluation of knowledge and attitude concerning with FSH among IUMS students. Therefore, the present study aimed to assess the level of knowledge and attitude toward FSH among IUMS students.

2. Materials and methods

A cross-sectional study was performed to evaluate the level of knowledge and attitude toward food safety and hygiene among the students of IUMS. To perform this study, students' information according to college status, gender, passed courses of hygiene and food safety, field of study, level of study, year of entrance (as the presence duration) were established from university's educational department. Morgan-table was used to determine appropriate sample size. According to Morgan-table, the sample size was calculated 331 people with stratified random sampling method. Hence, to increase the power of the study and decrease the error, sample size was up-raised about 20% and a sample size was calculated of 400 cases. Random sampling method was used to student's choice from each school. Data were collected using a valid and reliable questionnaire (7). The questionnaire was divided into three sections. Part 1 included demographic and education data, Part 2 focused questions relevant to attitude of partners and Part 3 questions relevant to knowledge of participants. In this regard, 15 experts in food science and technology as well as educational authorities confirmed the validity of questionnaires. Using test-retest method, reliability of questionnaires was calculated by 30 students (α=0.80). Survey questionnaire composed of three main parts. Consequently, our researchers distributed the questionnaires between students of various schools and then those data collected after completion food safety and hygiene list. Data analysis was done using SPSS software for Windows, version-16. To compare the mean score of knowledge and attitude, subgroups were used One-way analysis of variance ANOVA, chi-square and Student t-test tests.

3. Results

In the current study, 400 questionnaires were dispersed which 331 ones were returned and analyzed (rate of response was 82.7%). The demographic characteristics of the participants are shown in Table - 1. Male participants comprised 55.3% of the subjects. Also, 49.8% of the subjects were undergraduate students. Also, the average age of the respondents was 21.1 ± 2.9 years. The Tables 2 and 3 showed items on attitude and knowledge towards FSH for respondents. According to responses 79.8% of students had great attitude towards FSH and 60.7% of them have believed that canned foods with bulging head should be discarded. Also, students had high attitude about reason of food poisoning is due to drinking raw milk by consumer and washing hands with soap and water is essential before food cooking. According to survey of 331 respondents a lower percent of the students had good attitude about food additives which said they are not much important in food safety and also keeping bread in recycled material pouch causes no problem. They also low attitude about the pasteurized milk which declared it can be kept at room temperature for 24 h. The students had poorer knowledge concerning

Table 1. Educational and demographic characteristics of participants (n = 331)

Variable	Variable levels	Number %	Variable	Variable levels	n (%)
College status	Medicine	79 (23.9)	Section	associate degree	13 (3.9)
	Nutrition	30 (9.1)		Undergraduate	165 (49.8)
	Health	30 (9.1)		Masters	69 (20.8)
	Paramedical	41 (12.4)		PhD and Medical	84 (25.4)
	Dentistry	20 (6)	Year of entry to the Isfahan University of Medical Sciences	2009	9 (0.3)
	Management and medical information	40 (12.1)		2010	1 (0.3)
	Nursing	40 (12.1)		2011	4 (1.2)
	Rehabilitation	30 (9.1)		2013	49 (14.8)
	New Science	21 (6.3)		2014	95 (27.8)
	Pharmacy	0		2016	108 (32)
gender	Male	183(55.3)		2017	53 (16)
	Female	148(44.7)	Passing courses related to food safety	Yes	164 (49.5)
				Not	167 (50.5)

best temperature for keeping cooked food which is between (5 to 65°C) and said that plastic containers are usually appropriate for foodstuff storage. Furthermore, our results indicated that more than 90% of participants had high knowledge to production and expiration date of food products when shopping as well as botulism is transferred via canned food. According to the results represented in the Table 4, there is a significant relationship between students' attitude and passing related courses (P = 0.01) and year of university entrance (P = 0.02) towards FSH. In addition, students' knowledge of FSH is significantly related to their college and field of study with P = 0.02 and P = 0.03, respectively.

4. Discussion

In this cross-sectional study, we found that there is a correlation between knowledge and attitude towards FSH (7). These findings revealed that students in some factors had more knowledge and in some other lower knowledge concerning with FSH was detected. The present study showed only 10.3% of respondents had weak attitude about whereas raw foodstuffs can be retained to cooked foods and almost 14.7% of participants believed that drinking unpasteurized milk cannot cause food poisoning by consumer. According to outcomes of recent researches performed in Taif University, almost half of the students had lower knowledge about with crude foods that are main cause of food poisoning (22). Previous studies by Al-Shabib et al. in 2017 showed that around 96% of participants were concerned whether food is cooked properly or not as well as most food-borne disease occur due incorrect cooking of food (23). Harmful pathogens are transmitted through uncooked foods resulted in gastrointestinal (GI) infection, diarrheal and human diseases (16). In the present study majority of respondents believed that it is necessary washing hands before cooking food. The poor hand-washing results in the presence of dangerous microorganisms on our hands via touching raw substance. This can create food contamination led to food poisoning and severe illness (24). Moreover, more than 79% of participants believed that being sufficient awareness of FSH subject is of high importance. The study conducted by Sockett et al; 1995 showed that many people know fundamental principles of FSH (25). According to the results achieved by Majowicz et al; 2016, there was a

Table 2. Results of assessment attitude towards food safety and health between students of Isfahan University of Medical Sciences

Row	Items	Strongly agree	Agree	Disagree	Strongly disagree
1	Being aware of health and food safety is of great importance	264 (79.8)	63 (19)	4 (1.2)	0
2	It is essential to wash our hands with soap and water before cooking	217 (65.6)	100 (30.2)	12 (3.6)	2 (0.6)
3	Reheating food ensures its safety	69 (20.8)	111(33.5)	122 (36.9)	29 (8.8)
4	Canned foods with bulging lids should be thrown away.	201 (60.7)	86 (26.0)	26 (7.9)	18 (5.4)
5	Food additives are not much important in safety of foods	20 (6.0)	28 (8.5)	176 (53.2)	107(32.3)
6	Raw foods can be kept next to the cooked foods.	34 (10.3)	80 (24.2)	128 (38.7)	89 (26.9)
7	Pasteurized milk can be stored for 24 hours at room temperature	23 (6.9)	95 (28.7)	141 (42.6)	72 (21.8)
8	Putting bread in recycled bags makes no problem.	13 (3.9)	64 (19.3)	123 (37.2)	131(39.6)
9	Drinking raw milk has a high risk of causing food poisoning	120 (38.7)	121 (40.3)	73 (14.7)	17(6.3)

Table 3. Results of assessing knowledge of health and food safety among students of Isfahan University of Medical Sciences

Row	Items	True	False
1	We check production and expiry date of food products when shopping	329 (99.4)	2 (0.6)
2	Fever and vomiting are of symptoms of food-borne diseases.	293(88.5)	38(11.5)
3	The proper temperature to keep food in the fridge is 2-5°C.	286(86.4)	45(13.6)
4	Botulism is transmitted through canned food.	306(92.4)	25(7.6)
5	There is no need to put pasteurized milk in the refrigerator to keep it safe	89(26.9)	242(73.1)
6	Milk and meat spoil quickly	310(93.7)	21(6.3)
7	Minced (ground) meat gets spoiled more quickly	267(80.7)	64(19.3)
8	Keeping bread in the refrigerator prevents it from going stale	244(73.7)	87(26.3)
9	It is more suitable to keep food cans in the fridge at a temperature of below zero.	156(47.1)	175(52.9)
10	Meat becoming slimy is a sign of its spoilage	260(78.5)	69(20.8)
11	The best temperature to store cooked foods is between 5 to 65°C.	109(32.9)	222(67.1)
12	Plastic containers are much healthier to store foods.	49(14.8)	282(85.2)
13	Staphylococcus aureus can be transmitted to the food through rashes of hands and face and nasal discharge.	226(68.3)	105(31.7)

significant relationship between knowledge and attitude of respondent concerning with FSH in high school students of Ontario, USA (17). Interestingly, results of our investigation indicated that participants who had passed courses correlated to FSH had positive knowledge and attitude towards food safety and hygiene. Our findings from students of University of Medical Science in Isfahan city are consistent with those spanish university students by Garayoa et al; 2005 and Midwestern Iowa State University students by Lin and Sneed et al; 2005, which showed those who received sufficient training and had passed courses about FSH had high knowledge and attitude (18,26). Furthermore, Unklesbay et al; 1998 in the University of Missouri revealed that respondents who had passed food-related courses had high knowledge and attitude regarding with FSH (7). Ultimately, main restriction of the present research is that it investigated only Isfahan University of Medical Sciences students which are educated people and also lack of cooperation by a number of participants.

Table 4. Results of the relationship between students' demographic and educational information and total scores of their attitude and knowledge about food safety and health of Isfahan University of Medical Sciences

Knowledge (*P*-Value)	Attitude (*P*-Value)	Demographic and Educational Variables
0.24	0.08	Gender
*0.02	0.45	College
0.18	0.86	Degree level
*0.03	0.22	Field of study
0.45	*0.02	Year of entry
0.22	*0.01	Passing courses related to health and food safety

*Significant at level of P-Value<0.05.

5. Conclusion

The data suggested there is crucial point for imparting health and food safety education between students in order to increase their knowledge and attitudes level. The awareness program should object not only to provide prior knowledge but also encourage appreciation the students to exactly practice the food safety principles in their operations. University training would be the top-place to teach the young with key food safety concepts because they are the founders and society food service supervisors in the future.

Conflict of interest

Authors have no conflict of interest.

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