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Study on attitudes of students of Islamic Azad University Tehran Medical Branch toward food safety, 2016

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Abstract

Background: Given the importance of high-quality healthy food for humans, contamination control is the most important concern for healthy staff.

Aim: To determine the attitudes of students at Islamic Azad University (Tehran Medical Branch) toward food safety.

Methods: This cross-sectional and analytic-descriptive study was conducted on 326 students of Azad University of Medical Sciences in 2016. A self-made questionnaire consisting of 40 questions was used. The reliability of the questionnaire was confirmed using internal consistency method (Cronbach's alpha coefficient of 0.80). After collecting data, we use descriptive statistical indexes (mean and standard deviation) among demographic variables and the level of knowledge to describe and analyze the data. The participants' attitudes and operation are measured by Spearman tests, and the analytical results are given using SPSS version 20.

Results: According to the findings, 55.3, 30 and 14.7 percent of students had high, moderate and low attitude scores toward food safety, respectively. In addition, male and female students had equal attitudes toward food safety, and no significant relationship between sex and attitude was observed a significant difference ($p>0.05$), but between educational levels ($p=0.008$) and ages ($p=0.001$) of students significance was a positive correlation.

Conclusions: Due to the low attitudes score of about half of the students of Islamic Azad University Tehran Medical Branch toward food safety, it can be claimed, food safety training in this community is required.

Keywords: Food safety, Attitudes, Healthy food, Food hygiene

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1. Introduction

Health and food safety are two significant principles that play a role in having a healthy environment and preventing various diseases among human beings (1). Safety climate and attitudes in industrial safety are the perceived values to measure safety in industries (2- 4). One of the global health concerns for people, based on statistics, is foodborne diseases (5). This issue can affect remarkably the health and economy of developing countries; however, this public health problem has high prevalence and distribution throughout the world in both developed and developing countries (1). Based on previous investigations, there is improper behavior in the transmission of foodborne diseases, including raw and uncooked food intake and unhygienic methods of food production (6, 7). The transmitted diseases through the food, according to research in European and North American countries, can be significantly attributed to improper methods of food preparation, such as low personal hygiene, the workers' handling of the food and cross-contamination. Among these, contamination transferred by staff's food or handling after using the toilet and transfer of bacteria from raw meat to salad vegetables can be mentioned (8, 9). Improper time and temperature in food storage is responsible for 70% of food poisoning and cross-contaminations accounts for 30% of food poisoning. The transmission of pathogenic bacteria and viruses such as campylobacter, salmonella, and hepatitis A virus, may occur because of bad hygiene in storing, handling and preparing food (9). Thus, foodborne diseases constitute about 45% of diseases in America and about 22% of diseases in Europe (10). These diseases show symptoms such as vomiting, diarrhea, headache, fever, fatigue, abdominal cramps and the presence of blood and pus in the stool (11). Inattention to consequences of non-compliance with health and food safety can lead to major economic and health problems like obesity, and a very high expense on people, the food industry, public health systems, society and public economy (12), so that these diseases in the USA result in 76 million patients, 32,500 hospital admissions and 500 mortalities (13). Up to now, the exact static data from foodborne diseases is not available in Iran, but in some studies, very poor hygienic practice by the food handler and consumer are reported (14, 15). Masoumi et al. reported that from 2006 to 2011 about 70000 -75000 people per year succumbed to food-borne diseases from uunsafe food, and each year this number is added to (16). Every year, millions of people suffer from food illnesses. In Iran, various studies have reported a good score in attitudes toward food safety. But every year, a lot of people are hospitalized due to food-borne diseases (17, 18). One of the life-threatening causes, especially among the young people, is foodborne diseases. Accordingly, for this and regarding the importance of food safety, it is essential to promote public awareness on health and food safety especially at a young age, to control effectively such diseases (19, 20). Jahed et al., in one study, reported that 68% of the students had good awareness about health and food safety, and 31% showed moderate awareness (21). To the best knowledge, there are few formal studies concerning the attitudes of Iranian students toward food safety. The objectives of the present study were to determine food safety attitudes about food hygiene in students of Islamic Azad University Tehran Medical Branch in Tehran province, Iran in 2016.

2. Material and Methods

This cross-sectional and descriptive study was conducted in 2016 on 326 students based on Cochran sample size formula from all of the 1,250 Islamic Azad University, Tehran Medical Branch students with about 30 students more to cover the missing data. The students were chosen through stratified random sampling by selecting the 6 groups of students of health fields according to previous study methods (1). Students that enrolled in this study were selected from those who have been studying for 2 to 4 years. The data collection tool was a self-made questionnaire consisting of 40 questions. The questionnaire consisted of two sections: part I on demographic characteristic (age, gender, educational level and field of study) and the part II on the questions of the attitudes toward food safety (Table 1). The Likert scale was used to rate four to zero for each statement as degrees, including strongly agree, agree, no opinion, disagree, and strongly disagree. The validity of the questionnaire, which is considered in the type of content validity, was obtained by the experts and its reliability (stability) was confirmed using internal consistency method (Cronbach's alpha coefficient of 0.80). The general context of the questions was about the production, reservation, usage, hygienic behaviors, disease transmission such as fevers, vomiting, while using detergents and gloves, training others about the possible dangers of pathogens, reading guide labels for using packing, the correct methods for usage, and finally the consumption edible amounts. After collecting data, we use descriptive statistical indexes (mean and standard deviation) among demographic variables and the level of attitudes to describe and analyze the data. The participant's attitudes are measured by Spearman test and the analytical results are given using IBM© SPSS© Statistics version 20 (IBM© Corp., Armonk, NY, USA) and Excel software. The significance level of 5% was considered.

Table 1. Azad University of Medical Sciences students' response to questions on food safety attitudes, 2016

no.	The food is contaminated by Staphylococcus aurous via nasal secretions, hands and face rash.
1	It is important to learn about hygiene and food safety.
2	It is necessary to wash hands with soap and water before cooking.
3	Reheating food ensures health
4	Canned foods with buckled lids must be discarded.
5	The presence of food additives is not important in food safety
6	Raw and cooked foods can be adjacent to each other.
7	I can store pasteurized milk at room temperature for a day.
8	Bread can be stored in recycled bags without any problems.
9	There is a high risk of poisoning by raw milk consumption.
10	It is enough to wash vegetables with water.
11	Eggshells should not be washed.
12	Eggs should not be stored as canned food
13	One of the ways for suffering from human parasites is the consumption of raw and undercooked meat.
14	Smoked fish can cause botulism in humans.
15	Meat should not be kept at refrigerator temperature over two days.
16	Meat should be stored for over two days in -18ºC.
17	The risk of poisoning is decreased by taking cooked food in a short time, less than 2 hours after cooking.
18	Eating fish is helpful for cardiovascular health.
19	Honey is a way to transmit botulism to infants.
20	Hamburgers are a way to transmit salmonella to human.
21	There is a possibility of high risk for cancer by overuse of sausages.
22	Eating fish three times per week is conducive to heart health.
23	Older eggs will float in water.
24	There is possibility of poisoning by rupture of sausage casing.
25	Refreezing meat should be avoided.
26	Mold can create spots in white or green color on the sausage.
27	Raw meat and meat products such as sausages, salami, ham, etc. should not be placed beside each other in the fridge.
28	Pasteurized milk is preferable to sterilized milk.
29	I should boil unpasteurized milk before taking.
30	Food can be contaminated by Staphylococcus aurous via nasal secretions, hands and face rash.
31	It is important to learn about hygiene and food safety.
32	It is necessary to wash hands with soap and water before cooking.
33	Reheating food ensures health
34	Canned foods with buckled lids must be discarded.
35	The presence of food additives is not important in food safety
36	Raw and cooked foods can be adjacent to each other.
37	I can store pasteurized milk at room temperature for a day.
38	Bread can be stored in recycled bags without any problems.
39	There is a high risk of poisoning by raw milk consumption.
40	It is enough to wash vegetables with water.

3. Results

Due to the cost and time constraints, this community was small. Its results are given as the following and have been reported. The mean age of 1,250 students in the current research was 21.1±3.1 years. The demographic information of. Azad University of Medical Sciences students in 2016 has been listed in Table 2. According to the results, a good attitudes score can be seen among 55.3% of students, 30% of them showed moderate attitudes, and a poor attitudes score was found among 14.7% of the participants. According to Tables 3 and 4, a significant difference for attitudes to health and food safety was statistically found among the various age groups and educational levels. The maximum attitudes to food safety were obtained among the students of health and food safety, nuclear medicine and the surgery room. The minimum attitudes were among the students of laboratory science and public health, Table 5.

Table 2. The characteristics of the studied population (Azad University of Medical Sciences students)

Variable	Parameters	n (%)
Genres	Male	108 (33.1)
	Woman	218 (66.9)
Age (year)	<21	268 (82.2)
	21-24	45 (13.8)
	>24	13 (4)
College	Health	148 (45.4)
	Paramedical	74 (22.6)
	Medical and Pharmaceutical	57 (17.4)
	Nursing and Midwifery	47 (14.6)
Degrees	Associate Degree	29 (8.9)
	Masters	240 (73.6)
	MSc and PhD	57 (17.5)

Table 3. The results of attitudes among age groups

Age category		Mean differences	p-value	Confidence interval for the difference between means (95%)
1	2	4.96	0.001	(2.04 and 7.8)
	3	9.56	0.004	(3.01 and 16.1)
2	1	-4.96	0.001	(-7.8 and -2.01)
	3	4.59	0.178	(-2.24 and 11.43)
3	1	-9.56	0.004	(-16.1 and -3.01)
	2	-4.56	0.178	(-11.43 and 2.24)

Age categories: 1) Under 21 years, 2) 21 to 24 years, 3) 25 years and older

Table 4. The results of attitudes among educational levels

Education level category		Mean differences	p-value	Confidence interval for the difference between means (95%)
1	2	7.26	0.002	(2.70 and 11.83)
	3	5.92	0.028	(0.632 and 11.22)
2	1	-7.26	0.002	(-11.83 and -2.7)
	3	-1.33	0.442	(-4.76 and 2.08)
3	1	-5.29	0.028	(-11.22 and -0.63)
	2	1.33	0.442	(-2.08 and 4.76)

Education level categories: 1) Associate's degree, 2) Bachelor's degree, 3) Master's Degree and PhD

Table 5. Scores of attitudes toward food safety among the different students

Education Branches	n	Mean of score	SD
Food Science and Technology	23	104.3	10.3
General Hygiene	45	97.2	9.02
Nuclear Medicine	25	103.2	7.67
Environmental Health	45	98.1	11.99
Health Professional	35	102.4	11.07
Operating Room Technician	33	103	12.19
Medical Emergency	9	103.8	10.66
Laboratory Sciences	10	89.2	10.46
Doctor of Pharmacy	51	101.5	11.4
Doctor of Medicine	47	98.7	16.59
Nursing and Midwifery	25	100.6	11.94

4. Discussion

The present study examined the attitudes of students toward health and food safety on Islamic Azad University Tehran Medical Branch. Among them, 55.3, 30 and 14.7 of students have good, moderate and poor attitude scores, respectively. In addition, the subjects had relatively high attitudes concerning the most studied parameters. Jahed et

al. reported more than 50% of students of Tehran Medical University had poor attitudes about health and food safety (1). Jahed et al., in another study, reported that 90% of soldiers know about the necessity of this issue (21). Sockett, in one study in the past year, reported that many people have no awareness or attitude toward health and food safety around the world, and nowadays, studies also show that after many years, a poor attitude still remains (22). We found less than 15% in poor attitudes score toward food safety among our subjects, but this rate obtained more than 50% in Jahed studies (1). In addition, male and female students have equal attitudes toward food safety. Results also showed that there is no significant relationship between sex and attitude ($p>0.05$), but between educational levels ($p=0.008$) and ages ($p=0.001$) of students, there is positive significant correlation. In the Jahed et al. study, attitudes toward health and food safety had been enhanced by increasing the educational levels, so the findings of this study are consistent with the findings of their study (1). Results revealed that 90% of students studied when buying food read the label to seek production and expiration date. While a Marietta study reported that about 80% of students at the University of Missouri read the label during food shopping (23). Based on 80% of this study, student's opinion on only washing fruit with water is not sufficient to clean it. While in the Jahed et al. study, this rate was 75% (21). Young et al. in one study observed more than 80% poor attitude toward consuming raw food that may have a risk of food poisoning (24). The Jahed study showed that 30% of soldiers were aware that sterilized milk requires storing in a refrigerator (21). And the results of this study were the same. The necessity of washing hands with soap and water before cooking was perceived to 85% of subjects in the current study. While about 95% of the soldiers in Jahed's study were aware of the fact that microorganisms are found normally on the surface of fruits and vegetables because of accidental contamination with soil or dust (21). In this study, the highest attitudes toward health and food safety were related to the students of health and food safety. Unklesbay et al. determined the awareness, attitudes and performance of students about food safety, and they reported that the subjects who had taken a course on food had higher level of awareness and attitude, and even their performances were much better than the other students (25). A study of Pirsaheb et al. showed that attitude and practice of participants were increased significantly before 107.2 ± 14.6 and 43.93 ± 7.6 compared to after 112.23 ± 14.5; 46.11 ± 8 intervention respectively ($p<0.001$) (26). According to the results of these studies, health awareness, attitudes and performance of people can be increased through health education and good planning which is necessary to improve the understanding of how to produce and maintain food, and food consumption (1).

5. Conclusions

It is necessary to raise awareness and attitudes of people to health and food safety, resulting in prevention of food-borne diseases and preservation of food and environment against contamination. It can be claimed that it is very important to hold educational courses and training programs, particularly for students with a non-health major, considering low attitudes on food safety and health training among almost half of the students. It is recommended that such investigations be conducted on attitudes of safety of nanotechnology and food allergy among other populations in the future.

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Conflict of Interest:
There is no conflict of interest to be declared.

Authors' contributions:
All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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