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KNOWLEDGE AND ATTITUDES OF KERMANSHAH UNIVERSITY OF MEDICAL SCIENCES STUDENTS IN THE FIELD OF FOOD HYGIENE AND SAFETY

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Abstract

The role and importance of food safety on health protection and human health and preventing disease is well known. This study aimed to evaluate the students ' knowledge and attitudes of Kermanshah University of medical sciences students in the field of food hygiene and safety. This cross-sectional study using a valid and reliable self-report questionnaire among 338 students from the Kermanshah University of medical sciences that selected through random sampling. Designed questionnaire included in questions on personal information and knowledge of hygiene and food safety. Obtained results analyzed by SPSS-16 software.

The results showed that 46% of the students had good, 48% moderate and only six percent had poor knowledge on health and food safety. Knowledge and attitude about safety and food hygiene scores not significant correlation with any of the parameters including in age, education, gender, and school (P> 0.05) but between knowledge levels were significant correlation with sex and school (p <0.05), in addition, knowledge levels were not significant correlation with age groups and education levels (p> 0.05).

Attitude levels were not significant correlation with including in age, education, gender, and school (P> 0.05). We can conclude that having knowledge of hygiene and food safety is an important issue. Although the knowledge's students in this study was relatively good, but to enhance their knowledge, need for a more detailed plan to be felt.

Key words:

Knowledge, Attitude, Food Safety, Health, Kermanshah.

Introduction

Food poisoning and diarrhea disease is the major cause of mortality in the world (1 ,2). During 2001-2005, food-safety has been one of the priorities of the world health organization. The foods contaminant's pathogens could transfer by infected individuals through preparation, storage or other raw foodstuffs. Human errors during the food preparation are the major cause for most of the food poisoning outbreak (3, 4). Food poisoning occurred when the food have contaminated with pathogen organism or toxins. When the origin of this contamination is pathogen bacteria, the mismanaging in nutritional part (lack of proper maintenance) could cause the spread of contamination and eventually cause disease in susceptible individuals (5). The factors, which usually have role in the epidemic of food borne disease transmission, include improper storage of food (time/ temperature), contaminated tools, and preparing food from unsafe source, poor personal hygiene and inadequate cook (6). The usual symptom of food borne disease includes diarrhea, fever, headache, vomiting, abdominal cramp, fatigue and sometime blood and pus in stool (7). The studies have shown that there are more than 250 unknown food borne diseases. Bacteria and after that viruses and parasite caused most of the disease. The bacterial food borne diseases include *Botulism, campylobacteriosis, E. coli infection, salmonellosis,* and *shigellosis*(8, 9). Based on the estimation of the control and prevention disease center in U.S, yearly 75 million person have suffered from food borne disease which more than 325000 person were hospitalized and 5000 person were die (8, 10). In addition, the statistics about disease represent the importance of all the food- poisoning, which caused by improper and long consumption of contaminated and decayed food and the effects of them are obesity, diabetes, Hypercholesterolemia, osteoporosis (3, 11). One of the effective way of preventing financial and life loss from lack of food hygiene is educating and familiarizing the society with the food hygiene principles and the right consumption culture. On the other hand, having knowledge about the types of the foodstuffs and paying attention to the consuming food quality is an effective step toward proper using of the foodstuffs. Modeling and educating people could have an important role in reducing the disease which caused by the contaminated food consumption. The important point with this regard is people's practice of this health education. In most cases it have been seen that the society's people despite having a necessary knowledge about how to use and observed the food hygiene, refuse to do them for different reason such as negligence, false beliefs and select unusual traditional and unhygienic methods (3, 11). Undoubtedly increasing the hygienic knowledge level of preparation, producing, and distribution of foodstuffs and public places personnel could have a direct effect on the promotion of food safety, improve the services quality in public places, and eventually keep the recipient (12, 13).

Tavakoli et al. (2007) have done a study about the *Botulism* food-poisoning condition in Iran during 2003-2007. The results of this study showed that the measures such as public health education, not using traditional and unhygienic method in food processing, using adequate heat at the consuming time, not using unpasteurized dairy and regular control and supervision of hygienic authors could be effective in preventing dangerous food poisoning incidence (14). An intervention study has done by Pirsaheb et al. (2010) about the effect of health education on the knowledge, attitude, and hygienic practice of operators in preparation and distribution center of food in Kermanshah. The results revealed that by increasing the age and work experiences the individual's knowledge level have reduced. However, by the increase of literacy the knowledge, attitude and practice level have a significant increase (15). The studies showed that individual's education and increasing their knowledge level have an effective role in improving the nutritional situation (16). The aim of this research is to evaluate the knowledge and attitude of the students in Kermanshah's medical science university.

Material and Methods

This research is a cross-sectional descriptive study. The statistical population includes all the students in Kermanshah's medical science university in academic year of 2013-2014. The number of students in Kermanshah's medical science university was prepared from the educational assistance of university by the separation of faculty, major, degree, year of entrance, gender and then by the random sampling method with the proportional allocation method the required number of each faculty, major, degree and entrance year in two gender samples have determined for 338 person. The number of samples have determined by using $z= (z^2pq)/d^2$, d=0.05, α= 0.05 formula and the previous experiences and the data have collected by the questionnaire. In this questionnaire the tools validity have evaluated by using content validity. For determining the validity of this research the re-test test method have used. In this test, first the questionnaires have given to the 10 person of the students. Then after 10 days, the test has done again for that 10 people and the validity of the test have evaluated by the Pearson correlation coefficient statistic test. The Pearson correlation coefficient for the knowledge and attitude questionnaire has calculated 0.8 and 0.7 respectively. The questionnaire have regulated in three parts.

The first part includes demographic, the second include 12 knowledge questions, and the third part contains 10 attitude questions. In relation with knowledge question level, the score one and zero have given to each correct, incorrect and I do not know answer respectively. For the attitude question, the scoring for each phrase or statement have done by using Likert range and grading criteria of zero, 1, 2, 3, 4 which this range have shown by the totally

agreed, agreed, don't have idea, disagree and totally disagree grades. The maximum level of attitude question was 40. Also for knowledge total score classification from four grades, (lower than 3: poor, 4-6: average, 7-9: good and more than 10: excellent) and for the attitude total score classification from four grades (lower than 25: poor, 26-30: average, 31-35: good and more than 35: excellent) have used. The questionnaires have distributed among the students by the educated experts. The data have analyzed by the SPSS ver.16 software. Also for comparing, the scores average in different groups the One-way ANOVA and Scheffe post hoc analysis, chi-square and the independent t-test have used.

Results

In this study 338 people (128 male and 210 female) of students in Kermanshah's medical science university have evaluated which from the age point of view 101 person were lower than 21 years old, 185 people 21-24 and 52 people were more than 24 years old. In terms of major 108 person were in medicine, 52 person in health, 17person dental, and 27 person in paramedical and 48 person in nursing major have evaluated. For the degree 31 person in associate degree, 133 in bachelors, 167 in master and 7 people in Ph.D. have evaluated in this study.

The students answer to the food hygiene and safety knowledge question has shown in table1. According to the results, the most knowledge level of the students was in medicine, nursing, and midwifery, pharmaceutical, paramedical, health, and dental faculty respectively. There was not any significant difference between the knowledge and literacy (P=0.891). In a way that the most knowledge level were in Ph.D., bachelor, master and associate degree. There was a statistical significant difference between the knowledge level of lower than 21 years old age group and older than 25 years old age group. But there wasn't any statistical significant difference between the 21 years age group and 21-24 years old age group (P= 0.919). In addition, there was not any significant difference between the students' knowledge total score and their gender (P=0.140).

Table-1: Student responses to knowledge questions related to the food hygiene and food safety.

Questions	True	False	Total
	Frequency (%)	Frequency (%)	Frequency (%)
1. When buying a food the production and expiration date of it is considered.	83(24.6%)	255(75.4%)	338(100%)
2. The symptoms of food borne diseases are fever and vomiting.	165(48.8%)	173(51.2%)	338(100%)

3. The proper temperature for storing food in the fridge is 1-5 °C.	111(32.8%)	227(67.2%)	338(100%)
4. Botulism from canned food, can be transmitted	16(4.7%)	322(95.3%)	338(100%)
5. To maintain UHT milk samples, need to use the refrigerator is not.	203(60.1%)	135(39.9%)	338(100%)
6. The temperature of pasteurized milkis 72 °C for 15 seconds.	218(64.5%)	120(35.5%)	338(100%)
7. Ground meats quickly become putrefied.	263(77.8%)	75(22.2%)	338(100%)
8. Refrigerator equipment with temperatures below zero degrees Celsius is more suitable for storing cans.	272(80.5%)	66(19.5%)	338(100%)
9. Slimy surface portion of meat, it is not a symptom of being corrupt.	275(81.4%)	63(18.6%)	338(100%)
10. In terms of health, plastic containers for food storageare more suitable.	317(93.8%)	21(6.2%)	338(100%)
11. Staphylococcus aurous through welding hands and face and nasal secretions into the food.	147(43.5%)	191(56.5%)	338(100%)
12. Bacteria the main cause of diseases originating from the food.	118(34.9%)	20(65.1%)	338(100%)

The student's answers to the attitude question of food hygiene and safety have shown in table2. According to the results among the attitude questions, the question number1 (knowing the food hygiene and safety is very important) with 91.7% have the most response frequency and the question number8 (putting the bread in recycled nylons do not have any problem) have the totally agreed opinion. (table2).

Table-2: Student responses to attitude questions related to the food hygiene and food safety.

Questions	I quite agree	I agree	No idea	I disagree	I quite disagree
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
1. Knowing the hygiene and food safety is an important issue	310(91.7%)	22(6.5%)	2(0.6%)	4(1.2%)	0(0%)
2. Washing the hands with soap and water before cooking is necessary.	294(87%)	26(7.7%)	10(3%)	8(2.4%)	0(0%)
3. Reheating food, make sure	131(38.8%)	73(21.6%)	101(29.9%)	33(9.8%)	0(0%)

healthy food.					
4. Door cans of canned foods that are bulging, throw away.	258(76.3%)	40(11.8%)	24(7.1%)	16(4.7%)	0(0%)
5. Food additives in food safety are not important.	35(10.4%)	67(19.8%)	212(62.7%)	24(7.1%)	0(0%)
6. Raw foods can be placedalongside cooked foods.	35(10.4%)	73(21.6%)	196(58%)	34(10.1%)	0(0%)
7. Pasteurized milk can be stored at room temperature for 24 hours.	46(13.6%)	81(24%)	162(47.9%)	49(14.5%)	0(0%)
8. Put the bread in recycled bags is no problem.	24(7.1%)	45(13.3%)	244(72.2%)	25(7.4%)	0(0%)
9. Drinking raw milk is a high risk in causing food poisoning.	149(44.1%)	61(18%)	87(25.7%)	41(12.1%)	0(0%)
10. Washing vegetables with water is sufficient.	158(46.7%)	46(13.6%)	79(23.4%)	55(16.3%)	0(0%)

There was not any statistical significant difference in students' knowledge among various faculties (P= 0.101). In a way that the maximum attitude score was, belong to the dental, pharmaceutical, paramedical, health, medicine, nursing, and midwifery faculties. However, the attitude total score based on the age group have a significant difference (P=0.763). The maximum attitude score have seen in the 21 years old age group. In addition, there was not any significant difference between the students attitude total score and degree (P=0.125). In a way that the maximum attitude scores was for the bachelor, associate, master and Ph.D. degree respectively. The students' knowledge and attitude total score for food hygiene and safety have presented in table3 based on the gender, age group, faculty, and degree.

Table-3: Knowledge and attitudes of students in relation to health and food safety. (In terms of gender, sex, faculty, and level of education)

Variables		Frequency (Number)	Knowledge Mean ±SD	Attitudes Mean±SD
Sex	Male	128	6.29±1.94	29.32±4.93
	Female	210	6.59±1.49	29.2±4.31

Age groups (year)	<21	101	6.48±1.65	29.85±4.23
	21-24	185	6.45±1.68	29.25±4.63
	24<	52	6.56±1.77	28.06±4.62
faculty	Medicine	108	6.69±1.28	28.79±4.37
	Public Health	52	6.13±1.84	28.94±4.55
	Dentistry	17	6.12±1.16	30.24±3.53
	Paramedical	86	6.30±1.98	29.87±4.34
	Pharmacy	27	6.31±1.79	30.15±3.44
	Nursing and Midwifery	48	6.9±1.71	28.65±5.77
Level of education	Associate Degree	31	6.26±1.96	29.19±5.20
	B.Sc.	133	6.52±1.87	29.52±4.67
	MSc	167	6.47±1.48	29.16±4.23
	PhD	7	6.57±0.97	26.29±5.71
All students		338	6.47±1.68	29.25±4.55

Classification of students' knowledge and attitude total score about food hygiene and safety has shown in table4 based on the gender, age group, faculty, and degree. The relation between age group and knowledge grade was not statistically significant with the P= 0.914 and this relation in attitude of P=0.265 was not statistically significant. Also the faculties and knowledge degree relation was statistically significant P=0.028. Nevertheless, the faculties and attitude relation was not statistically significant P=0.068.

Table-4: Classification the total means score of knowledge and attitude of students in relation to health and food safety (In terms of gender, sex, faculty, and level of education).

Variables		Frequency (N)	Knowledge (%)					Aattitude (%)				
			Excellent	Good	Medium	Weak	Pvalue	Excellent	Good	Medium	Weak	Pvalue
Sex	Male	128	3.1%	45.3%	43%	8.6%	0.027%	3.1%	34.4%	49.2%	13.3%	0.06

	Female	210	1%	47.6%	48.6%	1.9%		1%	34.8%	48.6%	15.7%	
Age groups (yea	<21	101	2%	46.5%	47.5%	4%	0.914	2%	37.6%	50.5%	9.9%	0.265
	21-24	185	2.2%	45.4%	48.1%	3.4%		2.2%	35.1%	48.1%	14.6%	
	24<	52	3.8%	51.9%	38.5%	5.8%		0%	26.9%	48.1%	25%	
faculty	Medicine	108	0.9%	57.4%	41.7%	0%	0.028	0.9%	28.7%	54.6%	15.7%	0.068
	Public Health	52	3.8%	36.5%	50%	9.6%		1.9%	30.8%	50%	17.3%	
	Dentistry	17	0%	35.3%	64.7%	0%		0%	47.1%	47.1%	5.9%	
	Paramedical	86	4.7%	37.2%	50%	8.1%		1.2%	44.2%	44.2%	10.5%	
	Pharmacy	27	0%	40.7%	55.6%	3.7%		3.7%	37%	59.3%	%	
	Nursing and Midwifery	48	2.1%	58.3%	35.4%	4.2%		4.2%	29.2%	37.5%	29.2%	
Level of education	Associate Degree	31	3.2%	41.9%	45.2%	9.7%	0.381	3.2%	32.3%	48.4%	16.1%	0.484
	B.Sc.	133	3.8%	44.4%	45.1%	6.8%		2.3%	38.3%	43.6%	15.8%	
	MSc	167	1.2%	49.1%	47.9%	1.8%		1.2%	32.3%	53.9%	12.6%	
	PhD	7	0%	57.1%	42.9%	0%		0%	28.6%	28.6%	42.9%	

In addition, the results of grading level between knowledge and attitude showed that the knowledge and attitude grades were not statistically significant (P=0.635) (Table5).

Table-5: Relationship between the grade levels of knowledge and attitude.

Variables			Aattitude (%)				Total
			Weak	Medium	Good	Excellent	
Knowledge	Weak	Number	1	9	5	0	15
		% within Knowledge	6.7%	60.0%	33.3%	0.0%	100.0%
	Medium	Number	22	71	62	2	157
		% within Knowledge	14.0%	45.2%	39.5%	1.3%	100.0%

	Good	Number	27	80	47	4	158
		% within Knowledge	17.1%	50.6%	29.7%	2.5%	100.0%
	Excellent	Number	0	5	3	0	8
		% within Knowledge	0.0%	62.5%	37.5%	0.0%	100.0%
Total		Number	50	165	117	6	338
		% within Knowledge	14.8%	48.8%	34.6%	1.8%	100.0%

Discussion

According to the evaluations, it could have said that for determining the students' knowledge and attitude level in Kermanshah's medical science university about food hygiene and safety, there was not any significant relation between none of the age, degree, gender, and faculty parameters. There was significant relation between knowledge grade, gender and faculty ($P<0.05$). Nevertheless, the relation between knowledge grades, age group and degree was not statistically significant ($P>0.05$).

Also for student's attitude grade about food hygiene and safety, there was not any significant relation between none of the evaluated parameters.

The results showed that the students in some factors have high knowledge and in some other factors have low knowledge about food hygiene and safety. For example, more than 70% of the students have high knowledge about rotting meat methods. 39.9% of them have low knowledge about the milk maintenance in refrigerator methods. On the other hand, 4.7% of the students have low attitude about the deterioration signs of canned foods. The foodborne disease always could consider as a great threat for the vulnerable groups, which include the youth. This study revealed that 49% of students have good knowledge about the foodborne disease in a studies, which have done about the youth with the high school education level in America and the Missori University's student; it have showed that they have acceptable knowledge level about foodborne disease (17). Only 34.9% of students were familiar with the main factor of foodborne disease (bacteria) which was consistent with Wen-Hwa study (2011) (18). The results of the present study showed that by the increased of the degree and education level, the samples knowledge about food hygiene and safety have not increased which was not consistent with Sharifiradet al. (2001) study (19). In the present study 24.6% of the students declared that when they buy food products they would look at its label. In a study which

have done in Missori university more than 90% of students look at the products label when they buy a foodstuffs (20). The Mirghotbi et al. (2013) study's results showed that 82.8% of evaluated consumers read the foodstuffs label when they want to buy it (21). Also Hyang et al (1999) (22) and Kim et al. (2009) (23) reported that most of the consumers paid attention to the label particularly the producing and expiry date of the product when they want to buy a foodstuffs. Also 41% of the students believed that drinking the raw milk do not have the food poisoning risk. In a research, which has done in Taif University revealed that, more than 50% of the students have knowledge about the food poisoning risk possibility in a case of eating raw foods (24).

A study, which have one by Labib Sharif (2010) about students' knowledge and attitude of food poisoning showed that the students have good knowledge (74.95%) and attitude (67.26%) (25). Also in Wen-Hwa et al. (2011) study more than 90% of the evaluated individual have good knowledge about food poisoning (18). The raw uncooked and contaminated food caused the production of harmful microorganism which when transferred to the healthy foods could be the cause of foodborne disease (26). The study's results of Lilian et al. (2012) about evaluating the knowledge, attitude and practice of foodstuffs sellers in schools for the food hygiene and safety showed that the studied individual have good knowledge (98.8%) about the separation of raw and cooked foods (27) which was consistent with the present study. In the present study, 34% of the students have negative attitude about the fact that raw food could have placed beside the cooked food. In the present study, 87% of the students believed that washing the hands with the water and soap is necessary before cooking the food. The poor washing hand could cause the retention of pathogens viruses and bacteria on the hands, which have obtained by touching the raw materials (28) which was consistent with Lilian et al. (2012) study (27). In Lilian et al. (2012)study 97.6% of the studied individuals were agree with washing hand before working with the foodstuffs in order to prevent the contamination.

The results of the Ghazali et al. (2012) study showed that 70.7% of the restaurant's staffs have adequate knowledge about the proper method of washing hands for eliminating the viral and bacterial pathogens (29). Also in the present study 16.3% of the students believed that washing the vegetables and fruits just with water is not enough and more than 90% of the students believe that having knowledge about hygiene and safety is very important and necessary. The studies, which have done by Sockett et al. (1995), showed that most of the people do not know the major principles of food hygiene and safety (30). In addition, the evaluation, which has done in 1985-1986, showed that the responders do not have knowledge about the fact that the foods have exposed to a high risk of food poisoning (31, 32).

Conclusion

The results of the study showed that there was a significant difference between knowledge and attitude and food hygiene and safety among the students. In addition, the results showed that some of the academic majors have low knowledge about food hygiene and safety. Therefore, it is necessary to consider some special arrangements for promotion of students' knowledge and attitude.

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