



Evaluation of food hygiene among female students in Ghazni, Afghanistan

R. KAMAL* AND F. NASIRI

*Agricultural Economics and Extension Department, Faculty of Agriculture,
Ghazni University, Ghazni, Afghanistan*

*rohullahkamal9@gmail.com

Date of receipt: 07.08.2021

Date of acceptance: 04.11.2021

ABSTRACT

The purpose of this study was to investigate the knowledge, attitude and practice (KAP) regarding health and food safety among female students, Ghazni University, Ghazni, Afghanistan and to explore the association between their socio-demographic and academic characteristics. This analytical study was performed on 150 female undergraduate students of Ghazni University by using a self-administered questionnaire consisting of demographic information, awareness and attitude towards health and food safety. The collected data was analyzed using SPSS-23. The results showed that the students had medium level of knowledge, attitude and practices toward food hygiene, sanitation and food contamination related to food safety. Also result showed over 37% of students lack the knowledge about refrigerator storage and uses. On the other hand, over the 69% of students had good knowledge on food safety. And more than 18% had lack of food safety attitude in raw food keeping, food reheating and food poisoning. The overall KAP percentage score were 1.88 ± 0.65 respectively. In general, this paper indicates the significance of female student's knowledge and attitude about food safety. Continuous education and training should be organized to strengthen female student's knowledge in areas which seem to be deficient.

Key words: Attitudes, female students, Ghazni University, knowledge, practices

INTRODUCTION

Food safety is the assurance that food will not hazard to the consumer when it is prepared or eaten (WHO, 2004). It requires correct handling from farm to the consumption table (Bruhn and Schutz, 1999). Poor food-handling and hygiene practices in the domestic kitchen are thought to cause a significant number of food-borne illnesses (Jay et al., 1999). Food safety continues to be a concern for consumers, food industry and regulatory agencies. Every year, millions of people worldwide die and many are hospitalized from foodborne diseases and illnesses as a result of consumption of contaminated food (Osaili et al., 2011). Usual sources of food safety knowledge suggested in food safety research are: university studies, the private

home, family and friends, personal doctor, media, magazine articles, the internet, educational settings, government agencies, cooking classes at school or television shows (Marklinder et al., 2020). In Afghanistan, there is no specific subject on food safety. There are few departments of food related subjects in some universityies. On the other hand, more than 85% of the population of Afghanistan is dependent on agriculture and related activities for livelihood (Zahiryman and Hamayoun, 2020). Due to high risk in the agriculture and the huge losses to the farmers, the Ministry of Agriculture, Irrigation and Livestock (MAIL) of Afghanistan, in parallel with global strategy for poverty alleviation and food security has implemented and designed some projects. In Afghanistan, a meager of researches

attempted to study gender issues (Nicnam and Ghafari, 2020).

The cooking and storage of food at incorrect temperatures and the cross-contamination of food due to unhygienic handling practices are regarded as the main causes of many foodborne disease outbreaks. Factors such as poor personal hygiene and the procurement of food from unreliable sources have been found to contribute to foodborne disease outbreaks in food preparation and service facilities (Teffo and Tabit, 2020). Since it is currently impossible for food producers to ensure a pathogen free food supply, the home food preparer is a critical link in the chain to prevent food borne illnesses. Thus, home food preparers need to know how to minimize the presence of pathogens or their toxins in food (Medeiros et al., 2001).

Previous records show that over the 30% of the industrial countries' people may be influenced every year by food borne illnesses (FAO/WHO, 2008). According to the World Health Organization, the global incidence of food-borne diseases is difficult to estimate, but it has been reported that in 2005 alone 1.8 million people died from diarrheal diseases. According to U.S Agency for International Development report, the National Risk and Vulnerability Assessment conducted in 2005 found that approximately 61% of Afghans from the rural, urban, and Kuchi (unsettled pastoralists) populations experienced low dietary diversity and poor to very poor food consumption. In addition, a total of approximately 8.5 million Afghans throughout the country, roughly 30% of the population, do not meet their minimum food requirements and are food insecure to some degree. 20% of the population, approximately 6 million people suffer from chronic food insecurity, with the largest numbers of chronically food insecure people concentrated in the central highlands. The provinces manifesting very poor food diversity are: Day Kundi, with more than 80% of the population affected, Bamyán and Nuristan, 61-80% affected, and Ghor, Uruzgan, Zabul, and Nimroz, 41-60% affected. A great proportion of these cases can be attributed to contamination of food and drinking water. In 2005 estimated that an additional 1.9 million Afghans

are food-insecure, raising the current total of food insecure to approximately 10.4 million people. In industrialized countries, the percentage of the population suffering from food-borne diseases each year has been reported to be up to 30%. Food-borne diseases seem to have been increasing globally in recent years. This is due to dramatic changes in animal production, industrialization of animal production especially in poultry, mass production in food processing and distribution, globalization of food trade, and increase number of tourists around the world. All these factors have increased the significance of food-borne diseases (Sharif and Al-Malki, 2010). The WHO estimates of the global load of food-borne diseases as of 2015 show that 1 in 10 people fall sick every year with 420,000 deaths. Children under five are at high risk with 125,000 of them dying yearly due to foodborne diseases, with Africa and Southeast Asia having the highest bar. Diarrheal diseases are responsible for more than half of the global foodborne diseases load, causing 550 million people to fall ill and 230,000 deaths annually. Children are at particular risk of food-borne diarrheal diseases, with 220 million falling sickness and 96,000 dying yearly (FAO/WHO, 2019).

Fundamental good food hygiene practice, as described in the WHO, five keys to safer food (keep clean, separate raw and cooked, cook thoroughly, keep food at safe temperatures, use safe water and materials) can prevent the transmission of pathogens responsible for many food-borne diseases (WHO, 2005). Three important factors are playing major role in the incidence of food poisoning especially with regard to food handler. Knowledge, attitude and practice (KAP), these three factors were studied among Ghazni university female students as a model for studying these factors among other community. Information about Ghazni university female students on food safety KAP has not been studied previously. Exploring these three factors were used as indicator for the KAP score.

The female students in general are responsible to prepare food for families. The information gained would be utilized for health promotion, adoption of legislation and use of appropriate tools to increase knowledge, and changing wrong beliefs concerning

food habits and people's practices that increase the risk of food-borne diseases.

MATERIALS AND METHODS

The research was conducted in the Ghazni University, at central Ghazni province, Afghanistan. The Ghazni province is located in the southeast region of Afghanistan. It acquires a transitional climate between semi-arid with cold winter and warm dry summer (Ghafari et al., 2021). Ghazni province have 18 administrative districts. There are 5 faculties (Agriculture, Education, Sharia, Economics and Literature) in the University of Ghazni. The female student was included in the scope of the research.

Study design

A cross-sectional study was conducted from March to April 2021 to assess food safety knowledge, attitude and practice level of University female students who are living at hostel (private hostel) and their private houses in Ghazni city. The researchers visited them to inform them about the study, explain the objectives, significance, and protocol of the study and obtained a list of student's names and contact information. Then they distributed the questionnaires to the students and requested them to participate in the study.

Questionnaire and data collection

The questionnaire was firstly designed in English, then converted to the national language (Pashto) of Afghanistan. The questionnaires were distributed randomly to the participants and the forms were returned later from 150 female students.

Determination of knowledge, attitude, and hygiene practices of food safety

After signing the consent form, students were asked to complete a self-administered questionnaire that composed of four parts.

Part 1: Socio-demographic characteristics

Part 2: Food safety knowledge

Part 3: Food safety attitude

Part 4: Food hygiene practices

Socio-demographic characteristics

The student's socio-demographic characteristics (Part 1) such as gender and age were collected during the study. The age group were classified according to their age (16-20), (21-24), (25-28) and (above 28). On the other hand, educational level was classified according to their university classes (first class), (second class), (third class) and (fourth class).

Food safety knowledge

The questions regarding knowledge section (Part 2) included 10 close-ended questions with two likely responses; "true" and "false". The questions precisely covered the respondent's knowledge of individual cleanliness, food-borne illnesses, refrigerator storage, and raw food consumption. Each correct knowledge item reported was awarded a score of 2 point. Incorrect knowledge was awarded a 1 score. In this study, if "true" is the correct answer, then "true" score 2 point while "false" score 1 point.

Food safety attitude

The question regarding food handling attitude queries were designed in the (Part 3) of the questionnaire. This part assessed female student's attitude in food safety. It contains 10 structured queries with 3 likely answers: "agree", "disagree" and "uncertain". In this study, if "agree" is the correct answers, then "agree" score 2 points while "uncertain" 1 point and "disagree" score 0 point.

Food hygiene practice

The (Part 4) of the questionnaire the good hygiene practices of food handling procedures. There were 10 questions with four levels of answers: "Never", "Rarely", "often" and "Always". The score ranged between 0 to 4, if the answer is negative the score point reverse.

Data analysis

The findings were analyzed with respect to educational level and age variables using the Statistical Package for Social Science programs, Inc. software version 23 was used for data entry and analysis. Frequencies, averages, and standard deviations were calculated. The response was analyzed as categorical variable (right or wrong

answer). For knowledge questionnaire, right answer is considered as “having knowledge” and wrong answer as “no knowledge”. For attitude questionnaire right answer to wrong answer is considered as “agree, uncertain and disagree). For practice questionnaire is considered from never to always.

Ethical considerations

The study was approved by the research ethics committee of the Agriculture Faculty, Ghazni University, Ghazni, Afghanistan. Verbal consent obtained from all respondents were duly informed. The questionnaires used in information gathering were anonymous and confidentiality of data was guaranteed.

RESULTS AND DISCUSSION

The respondents of Ghazni university students to the knowledge questionnaire of food safety has been presented in the characteristics of female students showed in Fig. 1, food safety knowledge and percentage showed in Table 1, also their attitude in Table 3 and hygienic practice showed in Table 5.

Demographic data

Fig. 1 shows the characteristics of the 150 female students by age, educational background. As can also be seen in Fig. 1, the majority of the female students within the scope of the research were in the 16-20 years aged a total of 43.3% (65),

and followed by 21-24 years aged a total of 40.0% (60), 25-28 years aged were around 10.7% (16) and above 28 years aged were around 6.0% (9). On the other hand, the most of female students were in the second class 28.0% (42) the third semester of the university followed by first class, first semester were around 25.3% (38), fourth class 24% (36) and the third class were about 22.7% (24) (Fig. 1).

Demographic study is done to evaluate and determine the relationship of female student’s food safety KAP with their theoretical food safety knowledge. The collected data from student’s were summarized in Fig. 1. Participants recorded the demographic characteristics of the total number of respondents. The academic levels for most of the respondents fall into second class category.

Food safety knowledge

The response of Ghazni university students to the knowledge questionnaire on food safety is represented in Table 1. Over 88% of the students have excellent knowledge (answering right) on each of three statements out of 15. These are question number 1, 89.3%; question number 9, 84.7% and question number 10, 92.0%. On the other hand, more than 48% of the students lack the knowledge (answering wrong) on three important statements related to food safety. These are: question number 3, 42.0%; question number 5, 55.3%; question number 6, 48.0% respectively (Table 1).

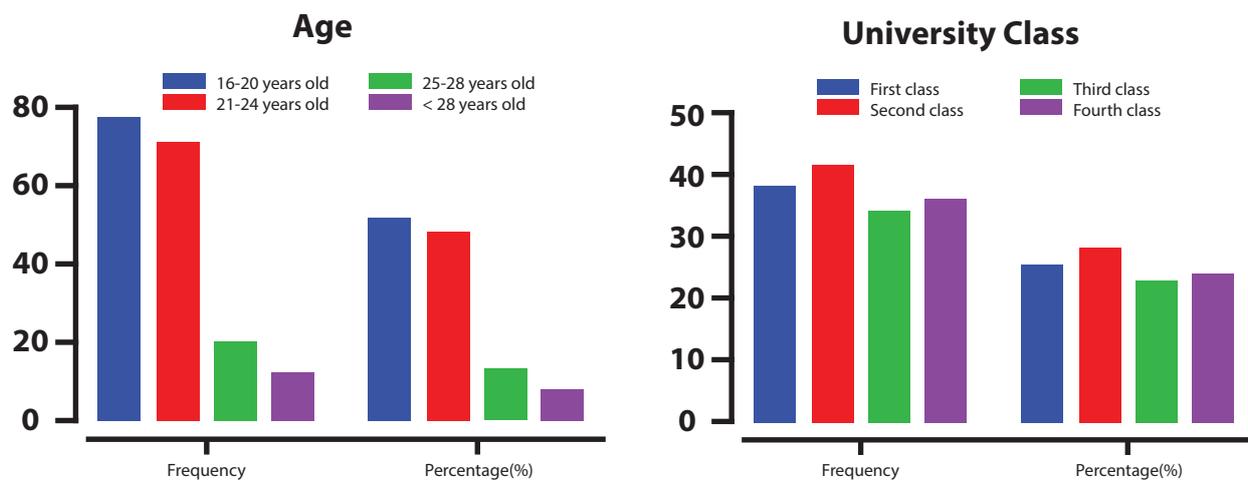


Fig. 1. Participants demographic characteristics

Table 1. Food safety knowledge of the female students (n=150)

No	Food safety knowledge questions	Response number (%)	
		True	False
1	Do you consider production and expiration date when you buy some foods?	134 (89.3)	16 (10.7)
2	Are fever and vomiting the symptoms of food poisoning?	112 (74.7)	38 (25.3)
3	Should the refrigerator temperature be below 5°C?	87 (58.0)	63 (42.0)
4	Is refrigerator more suitable than storage cans?	97 (64.7)	53 (35.3)
5	Is there any need to use the refrigerator for storage of sterilized milk?	67 (44.7)	83 (55.3)
6	Can milk and meat be corrupted quickly?	78 (52.0)	72 (48.0)
7	Is minced meat corrupted faster?	101 (67.3)	49 (32.7)
8	Are plastic containers suitable for food storage in terms of health?	98 (65.3)	52 (34.7)
9	Is washing eggs before putting them in the refrigerator correct?	127 (84.7)	23 (15.3)
10	Is eating moldy bread correct?	138 (92.0)	12 (8.0)

In the present study over the 89% of the students see leaflet of food in the time of food selling. In the study carried out in university of Missouri over the 90% of students looking the leaflet of food in time of selling (Anne and Kathleen, 1999).

Table 2 shows that the high level of knowledge among students. Most of the students represented the middle knowledge level concerning food borne disease as well as the proper procedures

for food storage, and the lowest level of knowledge about refrigeration. Giritlioglu et al. (2011) assessed cooking students' knowledge and practice regarding personal hygiene and food safety at two universities in Turkey, who concluded that although hygiene and food safety are viewed as an important factor among students, they did not reveal and sufficient knowledge in this field.

Table 2. Descriptive statistics for the food safety knowledge of 150 Ghazni University students

No	Questionnaire statement	Minimum	Maximum	Mean	SD
1	Do you consider production and expiration date when you buy some foods?	1	2	1.89	0.31
2	Are fever and vomiting the symptoms of food poisoning?	1	2	1.75	0.44
3	Should the refrigerator temperature be below 5°C?	1	2	1.58	0.50
4	Is refrigerator more suitable than storage cans?	1	2	1.65	0.48
5	Is there any need to use the refrigerator for storage of sterilized milk?	1	2	1.45	0.50
6	Can milk and meat be corrupted quickly?	1	2	1.52	0.50
7	Is minced meat corrupted faster?	1	2	1.67	0.47
8	Are plastic containers suitable for food storage in terms of health?	1	2	1.35	0.48
9	Is washing eggs before putting them in the refrigerator correct?	1	2	1.85	0.36
10	Is eating moldy bread correct?	1	2	1.92	0.27

Measure scale from 1 to 2

Food safety attitude

Table 3 shows the attitudes of students towards food safety. A positive attitude was reported by a great majority of women who agreed that “The Raw foods should be kept separately from cooked foods” (96.7%), Students believe that “Raw food should be kept on lower shelf and ready food should be stored on upper shelf of refrigerator” (68.0%) and the students were agreed with “Bacteria is the main cause of food poisoning” (55.3%), findings showed the majority of students

was disagree with “Government is responsible to control food poisoning” (42.0%), and believe that “Raw chicken, fish and meat should not contact each other” (66.0%), and the most of the students were disagree with “It is acceptable to use cracked or broken eggs” (50.0%), and also the majority of the students were disagree with “Dirty eggs can be used without washing if carefully broken” (60.7) and students believe that “The taste, appearance and odor of the food that causes food poisoning are bad” (77.3%) according to (Table 3.).

Table 3. Female students’ food handling attitudes about food safety (n=150)

Statements	Agree		Uncertain		Disagree	
	Frequency	%	Frequency	%	Frequency	%
Raw foods should be kept separately from cooked foods.	145	96.7	5	3.3	0	0.00
Raw food should be kept on lower shelf and ready food should be stored on upper shelf of refrigerator.	102	68.0	28	18.7	20	13.3
Bacteria is the main cause of food poisoning.	83	55.3	13	8.7	54	36.0
Food can be reheated once.	104	69.3	27	18.0	19	12.7
Government is responsible to control food poisoning.	51	34.0	36	24.0	63	42.0
Raw chicken, fish and meat should not contact each other.	99	66.0	29	19.3	22	14.7
Raw meat can be kept on lower shelf than raw vegetable.	60	40.0	53	35.3	37	24.7
It is acceptable to use cracked or broken eggs.	50	33.3	25	16.7	75	50.0
Dirty eggs can be used without washing if carefully broken.	91	60.7	17	11.3	42	28.0
The taste, appearance and odor of the food that causes food poisoning are bad.	116	77.3	19	12.7	15	10.0

The response of Ghazni university students to the attitude questionnaire on food safety is represented in Table 3. Over 81% of the students have positive attitude (answering right) on each of three statements out of 10. These are question number 1 “Raw foods should be kept separately from cooked foods”, 96.7%; question number 4 “Food can be reheated once”, 69.3%; question number 10 “The taste, appearance and odor of the food that causes food poisoning are bad”, 77.3%. On the other side, more than 18% of the students have negative attitude (answering wrong) in these three numbers 1, 4 and 10 questions.

The majority of the students 77.3% agreed with the statement “The taste, appearance and odor of the food that causes food poisoning are bad”. Many natural toxicants in vegetables are

bitter, examples include solanine in potato and oxalic acid in spinach. Since these compounds are usually present at small levels, they do not usually cause harm to people who eat those vegetables; instead, the benefit of eating fruit and vegetables far outweigh those risks. Ammonia and similar aromas is a sign of protein degradation, usually a sign of spoilage in seafood and meats, but they are desired, characteristics aroma in some aged cheese. It is clear that a flavor is not a true measure of food safety, but it can be an indicator of food spoilage (in the mouth and mind of the taster) and food safety (Cody, 2003). In their study conducted in Arizona, Meer and Minser (2000) determined that 61.0% of the participants did not agree with statement “food causing disease always smells bad and has a bad taste”, 30.0% agree with it and 9.0% were not sure and these results contrast with our findings.

In this research it was determined that the majority of the students disagree with the statement “Dirty eggs can be used without washing if carefully broken”, “It is acceptable to use cracked or broken eggs” In the study that Unusan (2001) conducted among housewives, the rate of those who washed the eggs with dirty shells was 79.7%, the rate of those who immediately consumed cracked eggs was 78.4%, and the rate of those disposed them was 14.9%. In the study carried out by Sargin (2005), it was found that the majority of the staff working in four and five star hotels (79.2% and 98.5%) stated that the cracked or broken eggs could be purchased and used. Cracked eggs should not be used as they can easily get spoiled due to their cracked shells (Unusan, 2001).

It was determined that most of the respondents in the research agreed with the statement “Raw foods should be kept separately from cooked foods”

and “Raw chicken, fish and meat should not contact each other” In Angelillo et al. (2000) study, 97.3% of the respondents agreed that washing hands before handling unwrapped raw or cooked foods reduces the risk of food poisoning. As described in the WHO five keys to safer food, raw and cooked should be kept separately (WHO, 2005). In the study conducted by Mitakakis et al. (2004), it was determined that 41.7% of the participants performed wrong applications in using raw food and 70.1% did so in using cooked food. The statement “Raw foods should be kept separately from cooked foods” is agreed by 99.1% of the respondents in the study conducted by Askarian et al. (2004) in Iran, these results are similar to those or our study. by 81.5% of the participants in Badrie et al. (2006) study and 59.3% of the participants in Bas et al. (2006) study. Table 4 shows the high level of food safety attitude among Ghazni university students in cooked and raw food keeping and the poor attitude in food poisoning and refrigeration.

Table 4. Descriptive statistics for the food safety attitude of students of Ghazni University

No	Questionnaire statement	Minimum	Maximum	Mean	SD
1	Raw foods should be kept separately from cooked foods.	1	2	1.97	0.18
2	Raw food should be kept on lower shelf and ready food should be stored on upper shelf of refrigerator.	0	2	1.55	0.72
3	Bacteria is the main cause of food poisoning.	0	2	1.47	0.65
4	Food can be reheated once.	0	2	1.57	0.71
5	Government is responsible to control food poisoning.	0	2	0.92	0.87
6	Raw chicken, fish and meat should not contact each other.	1	2	1.65	0.48
7	Raw meat can be kept on lower shelf than raw vegetable.	0	2	1.15	0.79
8	It is acceptable to use cracked or broken eggs.	0	2	0.67	0.89
9	Dirty eggs can be used without washing if carefully broken.	0	2	0.82	0.90
10	The taste, appearance and odor of the food that causes food poisoning are bad.	0	2	1.67	0.65

Measure scale from 0 to 2

Food safety hygiene practice

Table 5 shows the female students toward food safety hygiene practice. The majority of female students always (73.3%) checking the condition of food selling place. On the other hand, (75.3%) always checking food ingredients expiration date. Otherwise, the majority of female students (84.7%) washing their hand before eating and preparing

foods. And also, only a few numbers (40.7%) checking the taste of food for their goodness or badness. On the other hand, the majority of participant never (70.0%) using raw eggs and (78.7%) never use raw meat. The majority of female students rarely (34.7%) washing vegetables with potassium permanganate. The self-reported hygienic practices showed that only 18.7% of those

who involved in touching or distributing unwrapped foods routinely (always) use gloves during their working activity (Table 5). Of those female students who used gloves, before using washing their hands (32.7%) and after removing them always washing (68.7%).

The majority of the students involved in the research agreed and always gave attention to “the condition of the place where food stuff is sold are very important (cleanliness, hygiene, humidity)”. It was determined that most effective factor for consumer in selecting the place to buy food was the proximity of the place to their home by 55.1% while cleanliness and healthiness was the least effective factor 1.6%.

Earlier studies in adults have shown that knowledge about food safety tends to increase with age, the level of education, and experience in food preparation (Bruhn and Schutz, 1999; Unusan, 2007). In this study, too, it was determined that

the behavior of women with respect to food safety change by age and education. In the study carried out by Williamson et al. (1992), it was determined that as the educational level and age increased, the food safety knowledge also increased. Rimal et al. (2001) study indicated that educating consumers about preventive methods to reduce food safety threats will lead to reduced concerns and changes in food consumption habits. As-a-result of Goktolga et al. (2006) study, households who have high-education level are more interested in food safety than households who have low education level. In addition, old respondents are more interested in food safety than young respondents. In Roseman and Kurzynske’s (2006) study, significant differences were found in food safety perceptions by age and education. In Sudershan et al., (2008) study, significant associations were found between literacy and certain food safety practices. These findings are similar to ours research findings.

Table 5. Female students practice toward food safety hygiene practice (n=150)

Statements	Never		Rarely		Often		Always	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Do you checking the condition of the places where foodstuff is sold are very important (Cleanliness, hygiene, humidity)?	7	4.7	13	8.7	20	13.3	110	73.3
Do you check the expiration date of ingredients before using them in food preparation?	5	3.3	15	10	17	11.3	113	75.3
Do you wash your hand before preparing and eating food at home?	0	0.0	4	2.7	19	12.7	127	84.7
Do you check the taste of food for their goodness and badness?	9	6.0	44	29.3	36	24.0	61	40.7
Do you eat raw eggs or foods made from raw eggs?	105	70.0	38	25.3	7	4.7	0	0.0
Do you consume raw meat before cooking?	118	78.7	28	18.7	4	2.7	0	0.0
Do you use potassium permanganate for vegetable washing?	38	25.3	52	34.7	27	18.0	33	22.0
Do you wash your hands before using gloves?	59	39.3	19	12.7	23	15.3	49	32.7
Do you wash your hands after using gloves?	11	7.3	14	9.3	22	14.7	103	68.7
Do you use gloves when you touch or distribute unwrapped foods?	63	42.0	41	27.3	18	12.0	28	18.7

The hands of food service staff can be vectors in the spread of foodborne disease because of poor personal hygiene or cross-contamination. For example, a staff might contaminate his hands during using the toilet, or bacteria might be spread from raw meat to salad greens by food handler's hands (Fuerst, 1983). In our study students wash their hands, always need to wash their hand, before preparing and eating food at home (84.7%) (Table 5). Attitude is also an important factor that may effect on food safety behavior and practice, thus decrease the occurrence of food-borne diseases and other medical problems for consumers. Almost all the respondents agreed that washing hands before and during food preparation is mandatory. Codex Alimentarius Commission (2003) stated that sick food handlers who are known or suspected of having any disease that might be transmitted by food are not allowed to work or deal with foods (CAC, 2003).

The finding of the present study determined that students' knowledge and attitude levels increased due to increase in age that was consist with findings of Sanlier, Osaili et al. (2011) and Sharif et al. (2010). Moreover, several studies indicate that the importance of personal health and health issues were increasing along with increasing age, gaining experience and education level (Redmond and Griffith, 2003; Osaili et al., 2011).

The results of the present study showed acceptable knowledge, excellent attitude and relatively poor hygienic practice in Ghazni University, Ghazni, Afghanistan. Although the students have high level of knowledge concerning the general hygiene measure such as washing hands, using gloves and others, while majority of them have high knowledge level in the identification of specific disease or pathogenic which could be transmitted vis foods.

Table 6. Descriptive statistics for the food practice of students of Ghazni University

No	Questionnaire statement	Minimum	Maximum	Mean	SD
1	Do you checking the condition of the places where foodstuff is sold are very important (Cleanliness, hygiene, humidity)?	1	4	3.55	0.84
2	Do you check the expiration date of ingredients before using them in food preparation?	1	4	3.59	0.80
3	Do you wash your hand before preparing and eating food at home?	2	4	3.82	0.45
4	Do you check the taste of food for their goodness and badness?	1	4	2.99	0.97
5	Do you eat raw eggs or foods made from raw eggs?	1	3	1.35	0.57
6	Do you consume raw meat before cooking?	1	3	1.24	0.49
7	Do you use potassium permanganate for vegetable washing?	1	4	2.37	1.09
8	Do you wash your hands before using gloves?	1	4	2.41	1.30
9	Do you wash your hands after using gloves?	1	4	3.45	0.94
10	Do you use gloves when you touch or distribute unwrapped foods?	1	4	2.15	1.16

Measure scale from 1 to 4

Table 6 shows that the high level of hygiene practice among students in washing hands, condition of foodstuff place, checking date of expiration. Otherwise the students represented the middle hygiene practice level washing vegetables and use of gloves because the people of Afghanistan especially in rural societies don't know potassium permanganate and also the don't use slat for washing of vegetables they only use cool running water for vegetable washing, On the

other hand, most of the people don't use gloves while processing foods because of these there is a lot of food borne-disease outbreak in Afghanistan, as well as the poor hygiene practice in eating of eggs and meat, in Afghanistan most of the people don't have awareness about raw food eating problems especially in some cases of parasitic disease on the other hand most of the people drying meat and then use because they don't have access to the electricity and refrigerator.

Table 7. Knowledge, attitude and practice (KAP) percentage score of students of Ghazni University

Knowledge % score Mean ± SD	Attitude % score Mean ± SD	Practice % score Mean ± SD	Over all KAP% score Mean ± SD
1.66±0.43	1.34±0.68	2.69±0.86	1.88±0.65

The percentage score of knowledge, attitude, practice and overall (KAP) of Ghazni university students towards food safety is presented in Table 7. The study proves that educational level always could not lead to excellent attitude, otherwise food safety training also plays a significant role. However, this relationship showed that having good knowledge could lead to good attitude in food hygiene and sanitation among the respective food handlers. Studies by Acikel et al. (2008), Ansari-Lari et al. (2010) and Kunadu et al. (2016) found that there was a significant positive correlation between knowledge and attitude.

CONCLUSION

On the basis of these results, it can be concluded that participated students are not familiar in the food safety and the contamination of food by microorganisms and others. Medium knowledge of hygiene and food safety among female students at Ghazni University can increase the risks of associated with the consumed foods of students and the occurrence of different type of food poisoning. Therefore, training programs in the form of workshops and courses related to hygiene and food safety for students specifically lower grade students can be effective in increasing students' knowledge, because in Ghazni University we don't have food science related faculty to train the students. The most important issues are the lack of knowledge regarding refrigeration temperature, storage of food because of problems of electricity in Afghanistan.

LIMITATION OF THE STUDY

This study focused on the university female students live in Ghazni city, therefore the results should not be generalized to all females or university female students in the other place of Afghanistan. The study measured self – reported knowledge, which may be subjected to bias by the participants.

ACKNOWLEDGEMENT

The author thanks all students who agreed to participate in the present study and the management of the Ghazni University to support the study.

REFERENCES

- Acikel, C.H., Ogur, R., Yaren, H., Gocgeldi, E., Ucar, M. and Kir, T. 2008. The hygiene training of food handlers at a teaching hospital. *Food Control* **19** (2): 186-190.
- Anne, B. and Kathleen, J. 1999. Knowledge, attitude, and behaviors of college students regarding the nutrition labeling Education Act food label. *J. Am. Diet. Assoc.* **99**: 445-449.
- Ansari-Lari, M., Soodbakhsh, S. and 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.
- Angelillo, I.F., Viaggiani, N.M.A., Rizzo, L. and Bianco, A. 2000. Food handlers and foodborne diseases: knowledge, attitudes, and reported behavior in Italy. *J. Food Protect.* **63**(3): 381-385.
- Askarian, M., Kabir, G., Aminbaig, M., Memish, Z.A. and Jafari, P. 2004. Knowledge, attitudes and practices of food service staff regarding food hygiene in Shiraz, Iran". *Infect. Control Hosp. Epidemiol.* **25**(1): 16-20.

- Badrie, N., Gobin, A., Dookeran, S. and Duncan, R. 2006. Consumer awareness and perception to food safety hazards in Trinidad, West Indies. *Food Control* **17**: 370-377.
- Bas, M., Ersun, A.S. and Kivanc, G. 2006. The evaluation of food hygiene knowledge, attitudes and practices of food handlers' in food businesses in Turkey. *Food Control* **17**: 317-322.
- Bruhn, C.M. and Schutz, H.G. 1999. Consumer food safety knowledge and practices. *J. Food Safe.* **19**: 73-87.
- CAC. 2003. *Recommended International Code of Practice—General Principles of Food Hygiene*, Joint FAO/WHO Food Standards Program, Food and Agriculture Organization of the United Nations, Rome
- Cody, M.M. 2003. Taste and food safety. *J. Assoc. Food Drug Officials.* **67** (1): 22-26.
- FAO-WHO. 2019. *World Food Safety Day Guide*; Available from: <http://www.fao.org/faowhocodexalimentarius/worldfoodsafetyday/2019-theme/en/>. [Last accessed on 2019 Jun 08]
- FAO/WHO. 2008. *Assuring food safety and Quality: Guidelines for strengthening National Food Control System*, Joint FAO/WHO publication. Available at: www.who.int/foodsafety/publications/fs_management/guidelines_foodcontrol/en/index.html (accessed 10 July).
- Fuerst, R. 1983. Frobisher and Fuerst's microbiology in health and disease: Foods as vectors of microbial disease. *Sanitation in food handling* (15th ed.). W.B. Saunders Company: Philadelphia, pp. 418-433.
- Giritlioglu, I., Batman, O. and Tetik, N. 2011. The knowledge and practice of food safety and hygiene of cookery students in Turkey. *Food Control* **22**(6): 838-842.
- Ghafari, S.R, Darwish, M.O and Faizy, H. 2021. Integrated nutrient management practices for sustainable soybean [*Glycine max* (L.) Merr.] production: A case study of Ghazni province of Afghanistan. *e-planet* **19** (1): 31-38.
- Jay, L.S., Comar, D. and Govenlock, L.D. 1999a. A video study of Australian domestic food-handling practices. *J. Food Protect.* **62**(11): 1288-1296.
- Kunadu, A.P.H., Ofosu, D.B., Aboagye, E. and Tano-Debrah, K. 2016. Food safety knowledge, attitudes and self-reported practices of food handlers in institutional food service in Accra, Ghana. *Food Control* **69**: 324-330.
- Marklinder, I., Ahlgren, R., Blucher, A., Börjesson, S.M.E., Hellkvist, F., Moazzami, M. and Danielsson-Tham, M.L. 2020. Food safety knowledge, sources thereof and self-reported behaviour among university students in Sweden. *Food Control* **113**: 107130.
- Medeiros, L., Hillers, V., Kendall, P. and Mason, A. 2001. Evaluation of food safety education for consumers. *J. Nutr. Educ. Behav.* **33**: S27-S34.
- Meer, R.R. and Misner, S.L. 2000. Food safety knowledge and behavior of expanded food and nutrition education program participants in Arizona. *J. Food Protect.* **63**(12): 1725-1731.
- Mitakakis, T.Z., Sinclair, M.I., Fairley, C.K., Light body, P.K., Leder, K. and Hellard, M.E. 2004. Food safety in family homes in Melbourne, Australia. *J. Food Protect.* **67**(4): 818-822.
- Nicnam, M.M and Ghafari, S.R. 2020. Socio-economic factors affecting the role of women in family poultry production: A case study at Paghman district, Kabul province, Afghanistan. *e-planet* **18** (1): 39-46.
- Osaili, T., Obeidat, B., Abu Jamous, D., and Bawadi, H.A. 2011. Food safety knowledge and practices among college female students in north of Jordan. *Food Control* **22**(2): 269-276.
- Redmond, E. and Griffith, C., 2003, Consumer food handling in the home: a review of food safety studies. *J. Food Protect.* **66**(1): 130-161.
- Sargin, Y. 2005. *Ankara'daki do`rt ve bes, yıldızlı otellerde c, alıs, an yiyecek ve ic, ecek personelinin hijyen bilgileri ve uygulamalarının incelenmesi*. MSc thesis, Ankara University, Ankara.
- Sharif, L. and Al-Malki, T. 2010. Knowledge, attitude and practice of Taif University students on food poisoning. *Food Control* **21**(1): 55-60.
- Teffo, L.A. and Tabit, F.T. 2020. An assessment of the food safety knowledge and attitudes of food handlers in hospitals. *BMC Public Hlth.* **20**(1): 1-12.
- Unusan, N. 2001. Yumurthanın evlerde hijyenik olarak kullanılmasının belirlenmesi aras, tırması. *Sag`lık ve Toplum* **11**(3): 57-60.
- WHO. 2004. *Food and Health in Europe: A New Basis for Action*, WHO, Geneva, WHO regional publications European series, No. 96.
- WHO. 2010. *World Health Statistics*. WHO, Geneva
- WHO. 2005. Enterohaemorrhagic *Escherichia coli* (EHEC). WHO, Geneva, Fact Sheet No. 125 available at: www.who.int/mediacentre/factsheets/fs125/en/index.html (accessed 10 July 2008).
- Zahiryani, R. and Hamayoun, H. 2020. Effect of irrigation frequency on growth and yield of wheat (*Triticum aestivum* L. var. Chonte 1) under Kabul agro-climatic conditions, Afghanistan. *e-planet* **18** (1): 22-28.