

## Assessment of the Elderly and Their Caregivers' Practices Regarding Food Safety in Assiut Governorate, Egypt

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### Abstract:

Food safety continues to be a concern of consumers and a focal point of the food industry and regulatory agencies. For over a century, developments in food production and new control philosophies have contributed to food safety systems in most developed countries to be efficient in the prevention of food borne diseases. The elderly are at particular risk of food borne illnesses because of their weakened immune systems, decrease in stomach acidity and intestinal peristalsis. The aim: to assess the practices of the elderly people and their caregivers about food safety. Setting: The present study was carried out at Assiut city (urban) and Assiut district (rural) in Assiut governorate. Design: descriptive cross sectional research design. The subjects were 10% of the total number of the elderly people from every area was selected randomly who aged 60 years and above and their caregivers involved in the study. The total number of the studied elderly was 720 (340 from urban and 380 from rural areas) and their caregivers (135 subjects). Results: nearly the total subject from the urban elderly (97.1%) and the majority of rural elderly (86.3%) did not know the temperature of the refrigerator, more than two fifths (44.7%) of the urban and more than one fifth (20.3%) of the rural elderly defrosting product in tap water. Conclusion: the elderly and their caregivers (urban and rural) were followed incorrect defrosting practices, incorrect hygiene of the kitchen counter, lack of knowledge regarding refrigeration temperature. Recommendations: the information about food safety should be disseminated through mass media, television, newspapers and magazines at regular periods, establishment of an information center to help and guide the public especially mothers to maintain their practices regarding food safety.

**Key words:** food safety, defrosting, kitchen counter.

### 1. Introduction

Food safety is a growing concern for consumers and professionals in the food and food service sectors. It has been defined as the conditions and measures that are necessary during production, processing, storing, distribution and preparation of food to ensure that it is safe and becomes sound and fit for human consumption. The term "safe food" represents different ideas to different audiences. The descriptions of safe food held by consumers, academics, industry and special groups are different and diverse (Seward, 2003).

National surveys indicate that many people do not have good food safety practices. This results in an estimated 9.3 million illnesses a year associated with poor personal hygiene, 3.5 million illnesses a year associated with inadequate cooking or cross contamination, 0.5 million illnesses a year associated with not keeping food at safe temperature and 10, 000 illnesses a year associated with consuming food from unsafe sources (Trepka, et al., 2006).

In addition, food borne illnesses increase during the summer; bacteria are present throughout the environment in soil, air, water, and in the bodies of people and animals. These microorganisms grow faster in the warm summer months. Bacteria also need moisture to flourish and the summer weather is often hot and humid (United States Department of Agriculture (USDA), 2008).

Cross contamination of food borne pathogens in the household kitchen may contribute to the estimated 76,000,000 cases of food borne illnesses in the U.S. (Sharma, et. al., 2009). Improper domestic food handling and unhygienic practices are thought to be a major factor in cases of food borne illnesses. It is estimated that up to 87% of food borne illness outbreaks that occurred in the United Kingdom, Europe, Australia, New Zealand, the United States and Canada originated from food prepared or consumed in consumer's homes on a daily basis (Sharma, et al., 2009).

The low level of consumer protection in terms of food safety attributed to the lack of data on food and food-borne diseases. Spreading the awareness among the citizens on food safety standards and the importance of taking care of consumers' health should be emphasized. The food safety authority will make sure

that international food safety standards are applied. The authority will be responsible for food right from the harvest or breeding stage until it reaches the consumer (Mansour, 2010).

With the aging process, the ability of the immune system to function at normal levels decreases. The immune system is one of the most important mechanisms for fighting diseases and preserving health, so a decrease in the level of disease-fighting cells is a significant factor in the number of infections that may occur. In addition to the normal decrease in the function of the immune system as part of the aging process, undergoing major surgery also affects the body's ability to fight off infections (Gettings and Kiernan, 2001).

Also, inflammation of the lining of the stomach and a decrease in stomach acidity occurs. Because the stomach plays an important role in limiting the number of bacteria that enter the small intestine, a decrease or loss of stomach acidity increases the likelihood of infection if a pathogen ingested with food or water. Also adding to the problem is the slow down of the digestive process, allowing for the rapid growth of pathogens in the gut and the possible formation of toxins (Yen, 2003 and Center for Disease Control and prevention (CDC), 2004).

The nurse can teach the basics of keeping foods sufficiently refrigerated, discarding foods that may be old or spoiled, cooking foods thoroughly, and bringing water to a full boiling when appropriate to be certain of eliminating microbes. Nurses can emphasize washing and cleaning products and tools used in food processing, including the preparer's own hands (Allender and Spradley, 2001).

#### *1.1: Significance of the study:*

(Unusan, 2007) reported that people of all ages seem to think they know how to handle food safely, but their self-reported food handling practices does not support this confidence. A review of the consumer food safety literature indicates many gaps that have an impact on food-borne diseases at home.

A recent study of seniors who frequently prepare meals at home indicates that many do not use appropriate safety procedures related to food preparation. They appear to be at greater risk of serious complications when they experience food borne illness (American Dietetic Association (ADA), 2003).

## **2. Aim of the Study:**

This study was conducted to assess the elderly and their caregivers' practices regarding food safety.

## **3. Subjects:**

### *3.1. Research design:*

A descriptive cross sectional research design was used in this research.

### *3.2. Setting:*

This study was carried out in Assiut city and Assiut district in Assiut Governorate (El-Hamarah Elaola, El-Waledya Elbahary, Elbesary and Elsharekat from Assiut city). (Sallam, Mankhabad, El-Zawya and Awlad Ibrahim from Assiut district).

### *3.3. Subjects:*

The total number of elderly in year 2006 were (7271), 10% were taken randomly. The total number of the studied subjects were 720 elderly (340 from urban and 380 from rural areas) (aged 60 years and above), there were seven elderly persons were dropped out from the study (5 from urban and 2 from rural) and their caregivers (135 subjects) included in the studied subjects (35) from urban and (100) from rural.

### *3.4. Tool of the study:*

The tool was developed by (Jevsnik et. al., 2007) and modified by the researcher to obtain the necessary data. The interview sheet was done for both the elderly and their caregivers, it included the following:

#### *3.4.1. Socio- demographic data:*

It elicits information about the age, sex, marital status, level of education, residence ...etc.

#### *3.4.2. Assessment of the elderly and their caregivers' practices part:-*

It included questions about food safety practices during shopping, at home as ways of food defrosting, importance and technique of hand care, hygiene of the kitchen counter,.....etc.

## **4. Method**

### *4.1. Preparatory phase:*

The actual numbers of the elderly people in the previous mentioned areas and a permission to carry out this study were obtained.

### *4.2. Pilot study:*

A pilot study was conducted before starting of data collection, it was carried out on 20 subjects, which were excluded from the studied subject to confirm question clarity, and gauge likely interview duration.

### *4.3. Ethical considerations:*

Consent was taken from every participant, data was collected through interviewing the elders, and their caregivers individually, reassured that the information obtained will be confidentially, and used only for the purpose of the study.

**4.4. Data collection:**

Collections of the data were from January to May 2009 by the researcher and another two assistants who trained to collect the data and visited the selected houses.

**4.5. Statistical design:**

Data collected, coded, computerized, revised, categorized, tabulated and analyzed by using computer program SPSS "ver.17", using Chi-Square test to determine significance between non parametric data, using T-Test to determine significance for numeric data, it consider non significant when  $P > 0.05$ , it consider \*significant when  $P < 0.05$ .

**5. Results**

5.1. Table (1): distribution of the studied subjects (elderly and their caregivers) regarding their socio demographic characteristics.

Items	Elderly				Items	Care-givers			
	Urban N=340		Rural N =380			Urban N=35		Rural N =100	
	No.	%	No.	%		No.	%	No.	%
<b>Age:</b> Mean age $\pm$ SD	64.7 $\pm$ 5.2				<b>Age:</b> Mean age $\pm$ SD	30.0 $\pm$ 7.9			
<b>Marital status:</b>					<b>Marital status:</b>				
- Single	28	8.2%	7	1.8%	- Single	20	57.1%	7	7.0%
- Married	169	49.7%	215	56.6%	- Married	15	42.9%	93	93.0%
- Widow	141	41.5%	158	41.6%	- Widow	0	0	0	0
- Divorce	2	0.6%	0	0	- Divorce	0	0	0	0
<b>Educational status:</b>					<b>Educational status:</b>				
- Illiterate:					- Illiterate:				
- Read and write:	194	57.1%	319	83.9%	- Read and write:	0	0	51	51.0%
- Preparatory:	56	16.5%	33	8.7%	- Preparatory:	2	5.7%	21	21.0%
- Secondary:	19	5.6%	8	2.1%	- Secondary:	18	51.4%	20	20.0%
- University:	60	17.6%	20	5.3%	- University:	4	11.4%	3	3.0%
	11	3.2%	0	0		11	31.4%	5	5.0%
<b>Occupation before retirement:</b>					<b>Relation to the elderly:</b>				
House wife:	312	91.8%	340	89.5%		11	31.4%	7	7.0%
Employed:	28	8.2%	40	10.5%	- Daughter:	15	42.9%	93	93.0%
					- Son's wife:	9	25.7%	0	0
					- Other( son's daughter):				
<b>Presence of care-giver:</b>					<b>Resident with the elderly:</b>				
Yes :	35	10.3%	100	26.3%	Yes :	35	100%	100	100%
No :	305	89.7%	280	73.7%	No :	0	0	0	0

Table (1) describes the distribution of the studied subjects regarding their socio-demographic characteristics. It was observed that the mean age among the elderly was (64.7  $\pm$  5.2) and (30.0  $\pm$  7.9) among the caregivers, all the studied subjects (elderly and their caregivers) were females. With regard to the educational status of the elderly, more than half (57.1%) of the urban and the majority (83.9%) of the rural elderly were illiterate, less than one-fifth (17.6%) of the urban and only (5.3%) from the rural had a secondary education.

Concerning the educational status of the caregivers, more than half (51%) of the rural and none of the urban were illiterate, while the university education was reported by less than one third (31.4%) from the urban and only (5%) of the rural caregivers.

**5.2. Table (2): distribution of the studied subjects regarding their practice during shopping.**

Items	Elderly				Care-givers				p-value	X <sup>2</sup>	
	Urban N=340		Rural N =380		Urban N=35		Rural N =100				
	No	%	No	%	No	%	No	%			
<b>The responsibility of shopping.</b>											
Yes	265	77.9%	343	90.3%	P=0.000*	38.65	35	100%	100%	-	
No	75	22.1%	37	(9.7%)			0	0	0		
<b>The concerns believed to influence food choices:#</b>											
Knowing the country of origin	6	2.3%	0	0			4	11.4%	2	2.0%	
The price.	86	32.5%	49	14.3%	P=0.000*	21.67	17	48.6%	54	54.0%	P=0.000*
Appearance(shape and size)	118	44.5%	161	47.0%			17	48.6%	25	25.0%	
Fresh or canned food	65	24.5%	48	14.0%			17	48.6%	5	5.0%	
No concern	29	10.9%	86	25.1%			5	14.3%	28	28.0%	

# More than one answer was allowed

\*Significant

Table (2) illustrates the distribution of the studied subjects regarding their practices during shopping. It was clear that more than three quarters of the urban (77.9%) were responsible for shopping and also the majority of the rural (90.3%)(P =0.000).

As regard to the caregivers, all the studied caregivers (100%) in both urban and rural areas were responsible for shopping.

Regarding the concerns which influence their food choices, more than two fifths (44.5%) of the urban stated the appearance which includes shape and size and slightly this percent increases with the rural elderly (47%) followed by the price reported by around one third (32.5%) of the urban and (14.3%) from the rural elderly. The differences statistically were significant (P =0.000).

The price, appearance and fresh food reported by around one half (48.6%) of the urban caregivers, as regard to rural caregivers, more than half of them (54%) decided that the price is the most important concern when purchasing food followed by appearance which reported by one quarter (25%) of them, the differences statistically were significant (P =0.000).

**5.3. Table (3): distribution of the studied subjects regarding their practices at home.**

Items	Elderly					Care-givers						
	Urban(N=340)		Rural(N=380)		p-value	X <sup>2</sup>	Urban(N=35)		Rural(N=100)		p-value	X <sup>2</sup>
	No.	%	No.	%			No.	%	No.	%		
<b>Sources of cooking practices experiences.</b>												
By myself	55	16.2%	26	6.8%			0	0	0	0		
From parents	269	79.1%	354	93.2%	P=0.000*	41.38	35	100%	100	100%	-	-
From cookery books	12	3.5%	0	0			0	0	0	0		
Others( mother in law)	4	1.2%	0	0			0	0	0	0		
<b>The temperature of the refrigerator in the home is:</b>												
a. 50 degrees Fahrenheit (10 degrees Celsius)	0	0	0	0			0	0	0	0		
b. 40 F (5 C)	0	0	0	0			0	0	0	0		
c. I don't know; I've never measured it	330	97.1%	328	86.3%	P=0.02*	24.51	35	100%	100	100%	-	-
d. no refrigerator	10	2.9%	52	13.7%			0	0	0	0		
<b>Ways of meat, poultry and fish products defrosting.</b>												
a. setting it on the counter	18	5.3%	19	5.0%	P=0.02*	1.02	5	14.3%	40	40.0%	P=0.01*	14.25
b. placing them in the refrigerator	22	6.5%	18	4.7%			0	0	0	0		
c. in hot water	109	32.1%	174	45.8%			23	65.7%	33	33.0%		
d. cooking without defrosting	33	9.7%	26	6.8%			0	0	0	0		
e. tape water	152	44.7%	77	20.3%			17	48.6%	26	26.0%		
f. don't freeze meat, poultry or fish product	6	1.8%	66	17.4%			0	0	1	1.0%		

\*Significant

Table (3): Shows the distribution of the studied subjects regarding their practices at home. Concerning the sources of their cooking practices, most of the urban elderly (79.1%) and the vast majority of the rural (93.2%) learned their cooking experiences from their parents. Less than one-fifth (16.2%) of the urban compared to only (6.8%) of the rural learned from their experiences, the differences statistically were significant (P =0.000).

Regarding the caregivers, the total of the studied subject (100%) in both urban and rural learned their cooking practices from parents.

When asking about the temperature of the refrigerator, nearly the total subject from the urban elderly (97.1%) did not know the temperature of the refrigerator, they had not measure it before, (2.9%) of them did not have a refrigerator in their homes. While in the rural elderly the majority of them (86.3%) did not know and the rest of them (13.7%) did not have a refrigerator in their homes, the differences statistically were significant (P =0.02).

As regard to the caregivers, the total subject (100%) of both urban and rural caregivers did not know the temperature of the refrigerator; they had not measured it before.

Concerning their practices when defrosting meat, poultry or fish products, around one third of the urban (32.1%) and slightly less than half of the rural elderly (45.8%) defrost it in hot water and another more than two fifths (44.7%) of the urban and more than one fifth (20.3%) of the rural defrost it in tape water. The differences statistically were significant (P =0.02).

As regard to the practices of the caregivers, around two thirds of the urban (65.7%) and one third from the rural (33%) defrost it in hot water, around half of the urban caregivers (48.6%) and more than one quarter of the rural (26%) defrosting in tape water, the differences statistically were significant (P =0.01).

**5.4. Table (4): distribution of the studied subjects regarding their practices about hand washing**

Items	Elderly						Care-givers					
	Urban(N=340)		Rural(N=380)		X <sup>2</sup>	p-value	Urban(N=35)		Rural(N=100)		X <sup>2</sup>	p-value
	No.	%	No.	%			No.	%	No.	%		
<b>Washing hands before food preparation.</b>												
Yes	303	89.1%	352	92.6%	0.453	P=0.354n.s.	35	100%	100	100%	-	-
No	37	10.9%	28	7.4%			0	0	0	0		
<b>Importance of washing hands before food preparation. #</b>												
Cleaning (decrease number of microorganisms)	250	82.5%	181	51.4%	29.43	P=0.000*	30	85.7%	100	100%	23.51	P=0.01*
Preventing cross infection	55	18.1%	119	33.8%			5	14.3%	96	96.0%		
Do not know	0	0	51	14.5%			0	0	0	0		
<b>Ways of drying hands after washing.</b>												
Do not dry my hands.	56	18.5%	88	25.0%	13.53	P=0.000*	12	34.3%	40	40.0%	0.725	P=0.425n.s.
With a kitchen cloth	175	57.8%	82	23.3%			18	51.4%	60	60.0%		
With any cloth.	72	23.8%	182	51.7%			5	14.3%	0	0		
<b>Technique of hand care after handling raw meat, poultry or fish.</b>												
a. wiping them on a towel	23	6.8%	51	13.4%	14.25	P=0.03*	0	0	54	54.0%	11.41	P=0.000*
b. rinsing them under water	113	33.2%	106	27.9%			5	14.3%	-	-		
c. washing with soap and water	204	60.0%	223	58.7%			30	85.7%	46	46.0%		

# More than one answer was allowed

\*Significant

n.s.: not significant

Table (4) As regard to their practices about hand washing before food preparation, (P=0.354), the vast majority of both urban and rural (89.1%) and (92.6%) respectively reported that they washed their hands before food preparation because it is considered a cleaning and hygienic process which reported by most of the urban (82.5%) and more than half of the rural (51.4%). As regard to washing their hands for prevention of cross infection reported by less than one fifth of the urban (18.1%) and one-third (33.8%) of the rural, more than one-tenth (14.5%) of the rural did not know the importance of hand washing before food preparation, the differences statistically were significant (P=0.000).

Regarding the practices of the elderly about hand care after handling raw meat, poultry or fish, three fifths of the urban (60%) and less than of them (58.7%) of the rural stated washing their hands with soap and water while (6.8%) of the urban and more than one tenth (13.4%) of the rural were wiping their hands with a towel after handling raw meat, poultry or fish. the differences statistically were significant (P=0.03).

As regard to the practices of the caregivers about hand care after handling raw meat, poultry or fish, the majority of the urban (85.7%) stated washing their hands with water and soap and the rest of them (14.3%) was rinsing them under water, while in the rural more than half of them (54%) was wiping their hands with a towel and the rest (46%) were washing their hands with water and soap, the differences statistically were significant (P=0.000).

**5.5. Table (5): distribution of the studied subjects regarding their practices about the hygiene of the kitchen counter.**

Items	Elderly						Care-givers					
	Urban(N=340)		Rural(N=380)		X <sup>2</sup>	p-value	Urban(N=35)		Rural(N=100)		X <sup>2</sup>	p-value
	No.	%	No.	%			No.	%	No.	%		
<b>Presence of kitchen counter.</b>												
Yes	236	69.4%	167	43.9%	4.53	P=0.02*	16	45.7%	31	31.0%	0.425	P=0.381n.s.
No	104	30.6%	213	56.1%			19	54.3%	69	69.0%		
<b>Cleaning the kitchen counter.</b>												
After every use.	70	29.7%	10	6.0%	11.25	P=0.000*	6	37.5%	0	0	10.38	P=0.001*
After every meal.	22	9.3%	23	13.8%			0	0	0	0		
Once a day.	43	18.2%	78	46.7%			6	37.5%	28	90.3%		
When it is dirty.	101	42.9%	56	33.5%			4	25.0%	3	9.7%		
<b>Ways of cleaning the kitchen counters and other surfaces that come in contact with food.</b>												
a. water	212	89.8%	140	83.8%			0	0	0	0		
b. water and soap	0	0	27	16.2%	6.25	P=0.02*	16	100%	31	100%	-	-
c. water and soap, then bleach solution	24	10.2%	0	0			0	0	0	0		
d. water and soap, then commercial sanitizing agent	0	0	0	0			0	0	0	0		

\*Significant n.s.: not significant

Table (5) As regard to the way of cleaning the kitchen counter, the majority of both urban and rural elderly (89.8%) and (83.8%) respectively were cleaning it with water only and the rest of the rural (16.2%) was cleaning it with water and soap while in the urban, one tenth of them (10.2%) was cleaning it with water and soap and then using bleach solution, the differences statistically were significant (P=0.02). All of the caregivers in both urban and rural (100%) were cleaning it with water and soap.

## 6. Discussion

Since food buying is an important step in ensuring a safe food supply within the home, the findings showed that consumers were concerned about the foods they bought for consumption at home. The food selection and purchasing are seen as an important step in ensuring safe food supply at home. Household look at food risks generally, including nutritional, microbiological, and chemical risks. This suggests that an educational program should not be limited to aspects of product safety (Unusan, 2007).

Mostly, consumers tended to ignore the role of food and food handling in the transmission of diarrheal disease and attributed their symptoms to other factors (i.e., indigestion). If consumers misperceive the nature and source of food borne illness, it means that they misjudge the frequency of the diseases and would be less motivated to change behaviors related to food safety. This point should be put into the considerations when developing food safety education program (Unusan, 2007).

Concerning the responsibility of shopping or sharing in the decision, the percentage was higher among the rural elderly than the urban, due to the spread of street vendors in the rural areas (table 2). Less than three quarters of the respondents were responsible for purchasing the food for their households was stated by (Willett, 2003).

When asked about the concerns, which influence food choices, more than one-tenth of the urban elderly and more than one quarter of the rural elderly and nearly the same percents among the urban and rural caregivers had not any concerns when purchasing food. Appearance which includes shape and size was the most important factor influencing food choices among the elderly which reported by more than two fifths of both urban and rural elderly followed by the price. Among the urban caregivers, the price, appearance and the state of food (fresh or canned) had the same order (less than one half) while price was the most important factor influencing food choices among rural caregivers followed by the appearance which stated by one quarter while (Unusan, 2007) stated that the main reason was concern about price identified by more than one quarter followed by concern about fat content in the food.

Knowing the source of origin was reported by few of both urban elderly and rural caregivers and stated by more than one tenth of the urban caregivers. These results are lower than that recorded by (Willett, 2003) in which the source of origin was reported by two fifths of the respondents, the price and appearance stated by more than the half, this reflects the importance of health among the respondents of the other study and increased their awareness and economic condition.

The home food preparer is a critical link in the chain to prevent food borne illness. Thus, home food preparers need to know how to minimize the presence of pathogens or their toxins in food. Food is mishandled at any number of places during food preparation, handling and storage; and studies show that consumers have

inadequate knowledge about measures needed to prevent food borne illness in the home. Serving contaminated raw foods, cooking/heating food inadequately, having infected persons handle implicated food and practice poor hygiene, and consumption of food from an unsafe source were the factors most commonly associated with reported outbreaks of food borne illness in homes (Unusan, 2007).

Regarding the sources of the cooking practices experiences of the studied subjects, the majority of the urban elderly and the vast majority of the rural elderly in addition to all the studied caregivers (table 3) learned their cooking experiences from the traditional methods of parents and these resulted in acting the wrong practices. This percent is higher than that recorded by (Jevsnik et al., 2007) which revealed that more than half of the respondents learned their cooking practices from their parents and more than one fifth learned by themselves, this indicates the presence of many sources for learning cooking experiences in the other studies.

The storage life of many foods can be increased by storage at low temperatures. Hence, consumer food safety education programs will emphasize the benefits of temperature control on microbial growth and survival and hence as a valuable tool in keeping food safety at the home. The refrigerator should be kept at 5 °C (40 °F) or below and the freezer at -18 °C (0 °F) or below. Bacteria grow most rapidly between 5 °C and 60 °C (40 °F and 140 °F) with generation time as short as 20 min (Badrie, et al., 2006).

Concerning the temperature of the refrigerator, nearly all the urban elderly and the majority of the rural elderly (table 3) did not know the exact temperature of their refrigerator, they had never measure it, in addition to the entire sample of the caregivers, this is due to decreased awareness regarding cooling temperature and safe refrigeration of the food. These findings are worse than those recorded by another studies by (Badrie, et al., 2006) which showed that more than three fifths of the consumers either did not know or have never measured the temperature of the home refrigerator. (Tokuc, et al., 2008) revealed that more than one quarter of the respondents proved to be unaware of the correct temperature of the refrigerator and more than one tenth did not answer, while more than two fifths did not know that refrigerator and freezers should be controlled periodically. In (Jevsnik et al., 2007) recorded that forty-four percent of respondents did not know the temperature in their refrigerator, this may be due to the increased illiteracy among the elderly and delayed the presence and using the refrigerator in the homes in our society.

More than one tenth of the rural elderly had not refrigerator in their homes, these findings are better than the results which were conducted by (Abdel Khalek, 2003) which showed that more than two fifths had not refrigerator in the food serving places.

Food should never be thawed or stored on the counter or defrosted in hot water, it is recommended that when thawing, heating or cooling food, pass it through the middle of the temperature zone (70–120 °F) (21–52 °C) as quickly as possible as microorganisms grow faster in this range than at any point (Badrie, et al., 2006).

Concerning the way of defrosting the fish and poultry products (table 3), defrosting it in tape water was reported by around half of urban elderly followed by defrosting it in hot water. Among the rural elderly, the defrosting process was done in hot water by around half of them followed by tape water which reported by more than one fifth and the same order among the caregivers, both of them were wrong practices. These results were worse than those recorded by (Jevsnik et al., 2007) which revealed that thawing in hot water was recorded by more than one tenth and more than one tenth of food handlers in (Abdel Khalek, 2003) thaw the frozen food under running water, this reflects the decreased awareness regarding the correct handling practices among the respondents of the present study.

Leaving the frozen food to thaw on the kitchen counter was reported by few of both urban and rural elderly and two fifths of rural caregivers, these practices were recorded by more than one half in (Jevsnik et al., 2007), more than two fifths in (Badrie, et al., 2006) and recorded in most of the food serving places in (Abdel Khalek, 2003) and in (Fouda, 2000) demonstrated that more than two fifths of group 1 and more than one half of group 2 stated that meat, chicken and fish should be defrosted by leaving them on the counter.

Regarding hand washing before food preparation, the vast majority of both urban and rural elderly (table 4) wash their hands before food preparation. In addition to the entire subjects of both urban and rural caregivers. This was self reported practice may be involve bias, while in (Jevsnik et al., 2007) showed that most of respondents wash their hands prior to food preparation, and few of them wash their hands depending on what they were doing previously or what kind of food they are going to prepare. In the study by (Abdel Khalek, 2003) it is revealed that more than one third of the food handlers routinely washed their hands before handling any food, this referred to the awareness of the public about the importance of hand washing in diseases prevention.

Concerning drying the hands after washing, more than one half of the urban elderly and both rural and urban caregivers (table 4) drying their hands with a kitchen cloth. In (Jevsnik, et al., 2007) it was demonstrated that more than one quarter use a disposable paper kitchen towel. Almost one fifth of respondents dry their hands with



a kitchen cloth used for wiping the dishes, this pointed to the lack of awareness regarding drying the hands in special cloth and its importance in the process of preventing cross contamination.

Regarding hand care after handling raw meat, poultry or fish, few of the urban and more than one tenth from the rural elderly (table 4) wipe their hands on a towel after handling raw meat, poultry or fish in addition to more than one half of the rural caregivers, this could be leaving the hand washing process lastly until finishing the meal preparation. This findings is worse than that recorded in the study of (Fouda, 2000) in which few of both groups wiped their hands with towel and the same result in (Badrie, et al., 2006).

Rinsing the hands under water after handling raw meat, poultry or fish was stated by more than one third of urban elderly and more than one quarter of rural elderly and more than one tenth of the urban caregivers, this result as in (Jevsnik et al., 2007), the two results are lower than that recorded by (Fouda, 2000) which indicated that most of both groups rinsing their hands under water only.

With regard to the times for cleaning the kitchen counter, more than one quarter of the urban elderly (table 5) clean it after every use and less than one fifth from them clean it once a day. Regarding the rural elderly, around half of them were clean it once a day, among the caregivers, more than one third of the urban clean the kitchen counter after every use and equally of them clean it once a day. This result is lower than that conducted by (Jevsnik et al., 2007) which revealed that when the respondents were asked how often they cleaned their kitchen counter, most of them indicated that these kitchen areas were cleaned after every use or after every meal.

With regard to the way of cleaning the kitchen counter, the majority of both urban and rural elderly (table 5) cleaning it with water only while in the urban, one tenth of them clean it with water and soap and then using bleach solution. All the caregivers in both urban and rural areas were cleaning it with water and soap while in (Badrie et al., 2006) reported that the various practices applied to cleaning kitchen counters and other surfaces which are in contact with food, the main methods being cleaning with hot water and soap which reported by less than one third and more than two fifths stated hot water and soap, then apply bleach solution.

## 7. Conclusion and Recommendations

The present study concluded that the elderly and their caregivers (urban and rural) were followed incorrect defrosting practices, incorrect hygiene of the kitchen counter, lack of knowledge regarding refrigeration temperature. The study recommended that the Information about food safety should be disseminated through mass media, television, newspapers and magazines at regular periods, establishment of an information center to help and guide the public especially mothers to maintain their practices regarding food safety, designing food safety educational program that should be directed to the public with special emphasis on the high-risk groups as the elderly through mass media

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