

## Mother's Role in Providing Safe Food for Their Children under Five Years

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### Abstract

**Background:** Safe food is necessary to ensure a good and healthy life for humans, especially for children who will become the future of their countries, which is considered a mother's responsibility. **Aim:** the aim of this study was to assess mother's role in providing safe food for their children under five years. **Design:** descriptive design was used to conduct this study. **Setting:** The study was conducted at General Medical Center, in Tanta at Al Gharbiya Governorate. **Sample:** A purposive sample of 120 mothers from previous mentioned settings. **Tools:** Two tools were used for data collection, first tool: structured interviewing questionnaire and the second tool was checklist to assess hand washing technique. **Results:** 53.3% of the studied mothers had an unsatisfactory level of knowledge, 54.2% of the studied mothers have a suitable kitchen environment, 84.2% of the studied mothers hadn't done correctly practices regarding safe food, 75% of the children under five years old of the studied mothers hadn't health problems, and 81.7% of the studied mothers hadn't done hand washing' technique correctly. **Conclusion:** there was a statistically significant difference between mothers' socio-demographic characteristics and their knowledge, and there was a positive relation between mothers' knowledge and their practice regarding providing safe food for their children under five years. **Recommendations:** Health education programs regarding food handling should be implemented to increase mothers' awareness.

**Keywords:** Children under five years, Mothers provide safe food for their children.

### Introduction

Safe food is food that is free of pollutants and microbiological diseases. This involves food safety in all elements of food preparation and serving, as well as ensuring that food is not contaminated. (Abdelmonem and Argandoña, 2020).

Children under five years represent a large proportion of the world's population, so taking care of them is essential for the world's future development. Children are our future citizens and represent a significant portion of humanity's potential. They add to the country's economic and development strength. (Ayaz, et al., 2018).

Young children are more susceptible to foodborne illness than adults because of their immature immune systems, lower body weight, lower stomach acid production, and lack of control over their own meal preparation. (Manfred Kroger, 2019).

Mothers play an important role in the care of their children. Because of most children's foodborne illness happening at home, World Health Organization focused on the need to understand mothers' present knowledge, attitude, and practices regarding safe food. (<https://Who, 2020>).

Because of improper food-handling methods, mothers who make meals for their young

children at home may put their children at risk for foodborne infections. From manufacture to consumption, food safety necessitates careful management. Home food preparers must take numerous steps to limit pathogenic contamination. (Gautam & Curtis, 2021).

After swallowing an unsafe (contaminated) food or drink, symptoms may take hours or days to develop. Foodborne illnesses can have mild, as flu-like symptoms, but they can also lead to serious consequences, some of which are deadly. It can cause bloody stools, fever, vomiting, nausea, stomach pains, bloating, fatigue, little or no urination and diarrhea. Certain patients, however, require hospitalization, and some diseases result in long-term health issues or even death. Infections transmitted through food can cause arthritis, convulsions, fever, and muscular pains, as well as brain and nerve damage, and kidney failure due to hemolytic uremic syndrome (HUS). (Chlebicz and Śliżewska, 2018).

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

Food poisoning (F.P) is a leading cause of mortality in the United States, killing around 2 million people each year. Food-borne diseases are projected to affect more than five million people in Europe each year, resulting in significant economic losses and human danger. According to the research, foodborne illnesses impact an estimated 6.5: 33 million individuals in the United States each year, with medical expenditures and productivity losses ranging from \$9.3 to \$12.9 billion dollars. (Mkhungo, et al., 2018).

According to Tanta university hospitals' statistical in Egypt total number of children under five years attends to outpatient clinic of nutrition affiliated to the hospital suffering from different nutritional health problems such as diarrhea, hepatitis A and gastritis was 3742 children, so this study aimed to assess mothers' role in providing safe food for their children under five years. (Tanta university hospital' statistical department, 2019).

### **Aim of the study**

*This study aims to assess mothers' role in providing safe food for their children under five years through:*

1. Assessing mothers' knowledge about the safe food for their children under five years.

2. Assessing mothers' practice toward preparing of safe food for their children under five years.

### **Research questions:**

*This study was conducted to answer the following research question:*

1- Is there a relation between socio demographic characteristic of the mothers and knowledge about safe food for their children under five years?

2- Is there a relation between socio demographic characteristic of the mothers and the practice regarding safe food for their children under five years?

3- Is there a relation between mothers' knowledge and their practice regarding providing safe food for their children under five years?

### **Subjects and Methods**

#### **I-Technical Design:**

#### **Research Design**

Descriptive design was utilized for the current study.

#### **Research Setting:**

The study was conducted at General Medical Center (family medicine center), in Tanta which serve most of mothers and children at Al Gharbiya- Governorate, Egypt. This center serves large number of the study target

population and in different Scio-demographic characteristics.

### **Sampling:**

#### **Sample size and Characteristics:**

Purposeful sample was used, the average number of total attended mothers at the immunization clinic and family planning clinic at General Medical Center in Tanta equaled 1200 per month. The sample size was 10% of the total number of mothers, equaling 120 mothers who had children from 1 to 5 years old and their children were free from any chronic or acute diseases.

#### **Inclusion criteria**

1- Mothers attend with their children from 1: under 5years old.

2- Children should be free from any chronic or acute diseases (physical or mental).

#### **Tools of data collection:(two tools).**

Interviewing questionnaire form was designed by the researcher based on literature review and written in simple Arabic language to assess data about the following:

▪ **Part one:** Mothers' socio-demographic characteristics were used to assess mothers' demographic characteristics as (age, social status, level of education, occupation, family income, residence and number of children under five years old).

▪ **Part two:** Children's characteristics were used to assess their characteristics such as gender, age, and the child ranking).

#### ▪ **Part three:**

**A. Mothers' General knowledge about safe and unsafe food** was developed by the researcher based on the related literature review and written in Arabic language to assess knowledge of mothers about safe food. It

included 9 questions such as meaning of safe food, Characteristics of safe food, definition of unsafe food, characteristics of unsafe food, causes of unsafe food, signs and symptoms appears after eating unsafe food and the dangerous of unsafe food.

**B. Mothers' knowledge about unhealthy habits** that lead to food contamination. It included 11 items for unhealthy habits that may occur during preparing, cooking and storing food such as uncleaning hands, unkempt nails, sneezing and coughing near food, uncovered wounds, using canals water, storing vegetables and fruits outside the refrigerator and washing them with water only.

**C. Mothers' knowledge about healthy habits** that maintain food safety. It included 9 items for healthy habits which must be followed while preparing, cooking and storing food its safety such as wash hands by soap and water, using gloves, choosing utensils which made from healthy materials and excluding spoiled fruits.

#### **► Scoring system for total knowledge:**

Each correct answer took one score and the wrong answer took (zero), then these scores were summed-up and converted into a percent score. If scores < 60% means unsatisfactory knowledge, if score  $\geq$  60% means satisfactory knowledge.

▪ **Part four:** Mothers' Practice regarding safe food. It included 53 items.

**A- 43 items related to safe food practices** such as food hygiene, mother hygiene and mothers' practices during buying, preparing and storing food.

#### **\* Scoring system:**

43 items, the incorrect practices scored as the following: Never=2, Sometimes=1 and Always= zero, while the correct practices scored

as the following: Always= 2, Sometimes= 1 and Never= zero.

**B-10 questions related to kitchen hygienic measures** such as kitchen sanitation and ways for preventing infection.

**\* Scoring system:**

Each done correctly practice took one score, and not done practice took (zero).

**► Scoring system for total practices:**

All 53 items scoring were summed-up and converted into a percent score. If scores < 60% means not done practice, if scores  $\geq$  60% done correctly practice.

**Tool Validity & Reliability**

Face and content validity of the study tools was assessed by group of 5 experts in nursing department faculty of nursing, Ain-Shams University for comprehensiveness, accuracy and clarity in language Reliability done by using the Cronbach Alpha coefficient 0.845.

**II- Operational design:**

The operational design of the study entails three main phase:

**A- Preparatory phase:**

This phase included reviewing of literature related to mothers' role in providing safe food for their children under five years by using books, articles, journals, and internet. This served to develop the study tools for data collection. During this phase, the researcher also visited the selected places to get acquainted with the personnel and the study settings. Development of the tools was under supervisors' guidance and expert's opinions were considered.

**B- Pilot study:**

A pilot study was conducted on 10% of total sample of mothers to test availability of

study sample and clarity of the study tools. The pilot has also served to estimate the time needed for each subject to fill in the questions. According to the results of the pilot, some corrections and omissions of items were performed as needed. They were excluded in the main study subjects during the actual collection of data.

**C- Field work:**

Official permission was obtained from the manager of the General Medical Center in Tanta, Egypt. A letter was issued to them from the Faculty of Nursing, Ain-Shams University, explaining the aim of the study in order to obtain their permission and cooperation.

The researcher first met with the mothers having children under five years with the inclusion criteria attended to the General Medical Center explained the purpose of the study after introducing herself. The mothers were assured that the information collected would be treated confidentially and used only for the purpose of the research. Then, individual interviewing was done after obtaining the consent to participate.

The interview was conducted at the waiting hall of the center. The researcher explained all the parts of the questionnaire to the mothers and filled out the form by herself based on the mothers' answers, especially in the case of illiterate mothers or those with low educational levels. In the hand washing part, it was difficult to implement the steps in practice, so the steps were reported by the mothers.

The interview took about 30–45 minutes nearly to complete. The researcher visited the study setting twice a week (Saturday and Tuesday) from 9am to 2pm. The researcher met with 2–3 mothers every 2 days for 6 months from the period of 15 April to 12 October 2021 to collect data and implement this study.

**III- Administrative design:**

An official Approval obtained through an issued letter from the Dean of the Faculty of Nursing, Ain Shams University to the manager of the General Medical Center in Tanta- Egypt. The researcher then met the manager of the center and explained the purpose and the methods of the data collection.

#### **Ethical considerations:**

First approval from ethical committee in the Faculty of Nursing at Ain Shams University then Verbal approval was obtained from the mothers before inclusion in the study; a clear and simple explanation was given according to their level of understanding. They secured that all the gathered data was confidential and used for research purpose only. They informed also that they are allowed to choose to participate or not in the study and they have the right to withdraw from the study at any time.

#### **IV- Statistical Design:**

Statistical analysis was done by using SPSS 28.0. Quality control was done at the stages of coding and data entry. Data were presented by using descriptive statistics in the form of frequencies and percentage for qualitative variables. Graphs were done for data visualization using Microsoft Excel.

Inferential statistical Chi-square is used to test the study hypothesis. Pearson correlation coefficients were used for correlation analysis and the degree of significance was identified. A highly statistical difference was considered at  $p$ -value  $\leq 0.001$ , a statistically significant difference was considered at  $p$ -value  $\leq 0.05$ , and no statistically significant difference was considered at  $P$ -value  $> 0.05$ .

#### **Result:**

**Table (1)** showed that 46.6% of mothers aged 30 and more, 98.3% of mothers were married, 35% of them had a secondary education, 74.2% of mothers were not working, 57.5% suffered from insufficient income (the family income was not enough), 55.8% of

mothers lived in rural areas, and showed that 100% of mothers had only one child between the ages of 1 year and under five years.

**Table (2):** Reported that 52.5% of children under five years were male, 37.5% of the children aged four years and 37.5% of them were the third child in their family.

**Figure (1):** Illustrated that 53.3% of the studied mothers had an unsatisfactory level of knowledge and 46.7% had satisfactory knowledge.

**Table (3):** demonstrated that 66.7% of the studied mothers done correctly practice related to washing the kitchen floor, 37.5% of them done correctly practice related to eating contaminated food by their children, and only 17.5% of them done correctly practice related to the place where they kept their clean utensils. Also, the table showed that only 11.7% of the studied mothers done correctly practices related to how they used insecticides in the kitchen, and none of the mothers done correct practices related to washing the freezer.

**Figure (2):** illustrated that 84.2% of the studied mothers hadn't done correctly the all practices regarding safe food, while 15.8% of them had done correctly practices.

**Table (4)** presented that there was a highly statistically significant difference between mothers' socio-demographic characteristics and their knowledge about safe and unsafe food, in which the **P-value  $\leq 0.001$ , except** for the social status, in which there was a statistically significant difference, as  **$X^2=48.814$ ,  $P= 0.012$ ,  $p$ -value  $\leq 0.05$ .**

**Table (5)** presented that there was a highly statistically significant difference between the socio-demographic characteristics of mothers and their practice regarding safe food for their children under five years, in which **P-value  $\leq 0.001$  except** for social status, in which there was no statistically significant difference in which  **$X^2=21.937$ ,  $P= 0.909$ ,  $P$ -value  $> 0.05$ .**

**Table (6)** showed that there was a positive correlation between mothers' knowledge and their practice regarding providing safe food for their children under five years, in which **P-value  $\leq 0.001$** .

**Table 1: Distribution of studied mothers according to socio-demographic characteristics, N=120.**

Socio-demographic characteristics of mothers	No. (n= 120)	%
<b>Age/ years:</b>		
- Less than 20	29	24.2
- From 20 to less than 30	35	29.2
- From 30 or more	56	46.6
<b>Social status:</b>		
- Married	118	98.3
- Widow	-	-
- Divorced	2	1.7
<b>level of education:</b>		
- Do not read or write	5	4.2
- Read and write	10	8.3
- Primary	28	23.3
- Secondary	42	35.0
- University	35	29.2
- Other	-	-
<b>Occupation:</b>		
- Working	31	25.8
- Not working	89	74.2
<b>Income:</b>		
- Not enough	69	57.5
- Enough	34	28.3
- Enough and save from it	17	14.2
<b>Residence:</b>		
- Rural	67	55.8
- Urban	53	44.2
<b>Number of children under five years old:</b>		
- One	120	100
- Two	-	-
- Three	-	-
- More than three	-	-

**Table 2: Distribution of children related to their characteristic. N=120.**

Characteristics of the child under five years old	No. (n= 120)	%
<b>Gender:</b>		
– Male	63	52.5
– Female	57	47.5
<b>Age/ years</b>		
– One year	-	-
– Two years	11	9.2
– Three years	25	20.8
– Four years	45	37.5
– Five years	39	32.5
<b>The child ranking</b>		
– The first	37	30.8
– The second	25	20.8
– The third	45	37.5
– More than third	13	10.8

**Figure 1: Distribution of the mothers according to their total score of knowledge about safe and unsafe food. (N=120).**

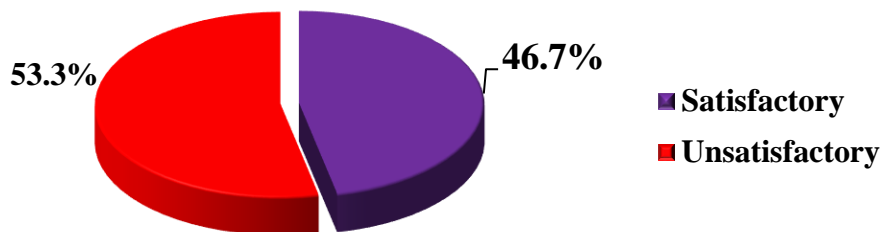
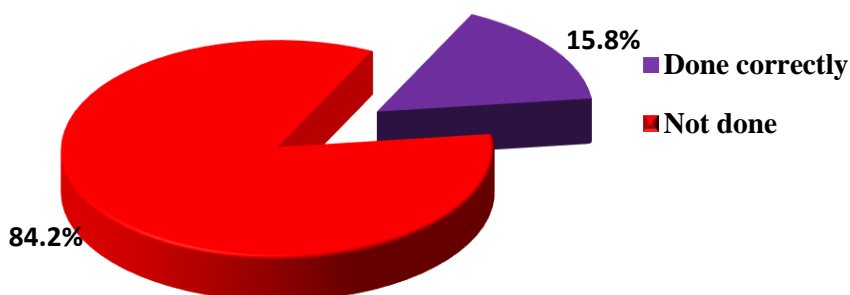


Table 3: Distribution of mothers related to their correctly done practices related to hygienic measures (N=120).

Assessing mother’s practices regarding related to hygienic measure	No. (n= 120)	%
<b>The place where the clean utensils kept</b>		
– It is placed in a closed and isolated place	21	17.5
<b>Kitchen waste disposal</b>		
– Daily	20	16.7
<b>Washing the kitchen's walls</b>		
– Weekly	5	4.2
<b>Washing the kitchen floor</b>		
– Daily	80	66.7
<b>Way to use the insecticides at the kitchen</b>		
– Getting all the utensils out of the kitchen first	14	11.7
<b>Washing the kitchen's surfaces (sink - countertops - cutting board - walls) by</b>		
– Hot water, soap and disinfectants	17	14.2
<b>Washing the refrigerator</b>		
– Weekly	9	7.5
<b>Washing the freezer</b>		
– Weekly	0	0
<b>Washing the stove.</b>		
– Daily	11	9.2

Figure 2: Distribution of mothers according to their total score of the all practices toward preparing of safe food for their children under five years. (N=120).





**Table 4: Relation between socio-demographic characteristics of mothers and their total knowledge about safe and unsafe food (N=120).**

Socio-demographic characteristics of mothers	Unsatisfactory (n=64)		Satisfactory (n=56)		Chi-square test	P-value
	N	%	N	%		
<b>Age/ years:</b>						
- Less than 20	29	45.3	0	0	160.599	<b>0.000</b> **
- From 20 to less than 30	6	9.4	29	51.8		
- From 30 or more	29	45.3	27	48.2		
<b>Social status:</b>						
- Married	64	100	54	96.4	48.814	<b>0.012</b> *
- Widow	-	-	-	-		
- Divorced	0	0	2	3.6		
<b>Level of education:</b>						
- Do not read or write	5	7.8	0	0	213.373	<b>0.000</b> **
- Read and write	10	15.6	0	0		
- Primary	23	35.9	5	8.9		
- Secondary	20	31.3	22	39.3		
- University	6	9.4	29	51.8		
<b>Occupation:</b>						
- Working	10	15.6	21	37.5	63.669	<b>0.000</b> **
- Not working	54	84.4	35	62.5		
<b>Income:</b>						
- Not enough	58	90.6	11	19.6	136.814	<b>0.000</b> **
- Enough	6	9.4	28	50		
- Enough and save from it	0	0	17	30.4		
<b>Residence:</b>						
- Rural	55	85.9	12	21.4	83.384	<b>0.000</b> **
- Urban	9	14.1	44	78.6		

(\*) Statistically significant p- value  $\leq 0.05$ , (\*\*) Highly statistically significant P – value  $\leq 0.001$

**Table 5: Relation between socio-demographic characteristics of mothers and their total practices about safe and unsafe food (N=120).**

Socio-demographic characteristics of mothers	Done correctly (n=19)		Not done correctly (n=101)		Chi-square test	P-value
	N	%	N	%		
<b>Age/ years:</b>						
- Less than 20	0	0	29	28.7	165.602	<b>0.000</b> **
- From 20 to less than 30	16	84.2	19	18.8		
- From 30 or more	3	15.8	53	52.5		
<b>Social status:</b>						
- Married	19	100	99	98.1	21.937	0.909 NS
- Widow	-	-	-	-		
- Divorced	0	0	2	1.9		
<b>Level of education:</b>						
- Do not read or write	0	0	5	4.9	277.965	<b>0.000</b> **
- Read and write	0	0	10	9.9		
- Primary	0	0	28	27.7		
- Secondary	0	0	42	41.6		
- University	19	100	16	15.9		
<b>Occupation:</b>						
- Working	3	15.8	28	27.7	81.833	<b>0.000</b> **
- Not working	16	84.2	73	72.3		
<b>Income:</b>						
- Not enough	0	0	69	68.4	183.867	<b>0.000</b> **
- Enough	11	57.9	23	22.7		
- Enough and save from it	8	42.1	9	8.9		
<b>Residence:</b>						
- Rural	0	0	67	66.3	110.569	<b>0.000</b> **
- Urban	19	100	34	33.7		

(NS)= Not statistical significant, (\*\*) Highly statistically significant P–value  $\leq 0.001$ .

**Table 6: Correlation between total knowledge and total practices about safe and unsafe food (N=120).**

Correlations	Total score of knowledge	
	R	p-value
Total score of practices	.754**	0.000**

(\*\*) Highly statistically significant P-value  $\leq 0.001$ .

### Discussion:

The safe food is the clean food that is absence of hazards which are harm humans' health'. Safe food permits the sufficient intake of nutrients and thus helps in achieving a healthy life. Conversely, consumption of unsafe food, contaminated with bacteria, viruses, parasites or chemical substances that considered life threatening. The WHO estimated that 2967 child dies from unsafe food consumption each year in Egypt. (*Hamed and Mohammed, 2020*).

Regarding data characteristics of the studied mothers (**Table 1**) the present study indicated that nearly half of the studied mothers were aged from 30 to more, and these findings agreed with **Boah, et al., (2019)** who conducted a study about " The epidemiology of under nutrition and its determinants in children under five years in Ghana" and reported that half of the studied mothers were aged from 30 to more.

However, these findings disagreed with **Mohammed, et al., (2019)** who conducted a study about "Assessment of Knowledge and Reported Practices of Mothers Regarding Food Handling among Their Preschool Children in AbuTig District, Egypt" and reported that the largest number of mothers aged 25 - < 30, which represent one third of the studied mothers.

Also, the current study revealed that more than one-third of the studied mothers had a secondary education, which considered the highest educational level. These findings were in the same line with **Maasa (2021)**, who conducted a study about " Knowledge, attitudes and practices on food hygiene and safety among mothers and caretakers of children under five years in Division A, Entebbe Municipality" and reported that over half of the

participants had attained secondary level of education as their highest level of education.

Conversely, this result disagreement with **Ayaz, et al., (2018)** who conducted a study about "Food Safety Knowledge and Practices among Saudi Mothers" and found that the highest educational level of the respondents was University level.

**From the researcher's point of view**, the difference in educational level may be because of the difference in the region where the study was conducted, as the current study was conducted in a rural area, unlike the study of **Ayaz, et al., (2018)**, which was conducted in an urban area.

Also, the present study indicated that three-quarters of the studied mothers were not working and more than half of them living in rural areas. These findings agreed with **kamal, et al., (2021)**, who conducted a study about "Effect of Video-Assisted Teaching on Mothers' Knowledge and Practices Regarding Preserved Food and Their Children Health" and found that two-thirds of the studied mothers were not working and half of them living in rural areas.

Regarding the data characteristics of the children (**Table 2**) the present study indicated that more than half of the children were male, this findings are supported by **Boah, et al., (2019)** who reported that the same percentage of children were males, but disagreed with him in the age of the children that his study founded that nearly two-fives of the children were aged three years old, while the present study indicated that two-fifth of the children were aged four.

Regarding the total knowledge of mothers about safe and unsafe food (**Figure 1**), the present study illustrated that less than half of the mothers have a satisfactory level of knowledge. This was

supported by **ElMezayen, et al., (2021)** who conducted a study about "Effect of Health Instructional Guidelines on Rural Mothers, Egypt' Knowledge and their Preventive Practices Regarding Fighting Food poisoning" who founded that less than half of the mothers had a satisfactory level of knowledge.

Also, this result is supported by the study by **Chellaiyan, et al., (2018)** about "Food safety awareness and food handling practices among rural population of Tamil Nadu." and reported that more than one- third of the study sample had adequate knowledge.

**From the researcher's point of view**, the similarity between the results may be due to the similarity of living conditions for the studied mothers.

Conversely, this result is in disagreement with **Harani (2018)**, who conducted a study about "Knowledge and Practices of Mothers Regarding Food Safety Presenting to Family Medicine Clinics at a Teaching Hospital in Karachi Pakistan" who found that the majority of mothers had adequate knowledge about food safety.

**From the researcher's point of view**, this finding is different from the current study due to the fact that this study was conducted at a teaching hospital that provides the mothers with periodic teaching programs to increase their level of knowledge, but the current study was conducted in a simple traditional center for mother and child.

Regarding to mother's practices toward preparing of safe food for their children under five years (**Figure 2**), the present study demonstrated that about one-fifth of the studied mothers done correctly practices related to safe food . this finding in the same line with the study of **Dagne, et al., (2019)** who published a study named "Food safety practice and its associated factors among mothers in Debarq Town, Northwest Ethiopia: community-based cross-sectional study" who found that less than half of the studied mothers done correctly practices.

Also, this result is consistent with **Chellaiyan, et al., (2018)** who found that more than one- quarter of the study sample had an adequate practice

On the other hand, this result contradicted with **Harani (2018)**, who discovered that three-quarters of the mothers studied had correct practices. From the researcher's point of view, this high level of practices reported in the Harani study was a normal result of the high level of knowledge of the studied mothers, as he mentioned in his study, which was the result of the periodic awareness programs carried out by Karachi Teaching Hospital.

The current study illustrated that, nearly one-third of studied mothers always read the packaged food's labels before buying to check ingredients, production date and expiration date, and less than fifth of them read the terms of use and storage of prepackaged food.

Those results disagreed with the findings of the study conducted by **Osaili, et al., (2022)** about "Knowledge, Practices, and Risk Perception Associated with Foodborne Illnesses among Females Living in Dubai, United Arab Emirates" in the first part, who reported that more than one-half of the study sample always read the packaged food's labels before buying to check ingredients, production date, and expiration date, but at the same time, the results agreed with them in the part of reading the terms of use and storage of prepackaged food, which mentioned that more than one-fifth of them did it correctly.

**From the researcher's point of view**, the difference may have resulted from the different habits and economic status of the two study' samples: Egyptian women, particularly those in rural areas (where the highest percentage of the studied mothers reside), used to buy fresh foods from traditional markets and rarely bought packaged foods, whereas Emirati women, as mentioned in their study, relied on buying packaged food from malls.

Also, **according to the researcher's point of view**, the similarities between the two studies

were attributable to the beliefs of eastern women, as they had a common conception that the most important information on packaged food labels was the date of production and the expiration date, without paying attention to the terms of use and storage.

In the present study, less than one-fifth of the studied mothers were disposed the waste correctly. This was agreement with the study of **Gizaw & Addisu (2020)** which was about "Evidence of households' water, sanitation, and hygiene (WASH) performance improvement following a WASH education program in rural Dembiya," who pointed out that only one-tenth of the studied mothers were disposed the waste correctly.

Also, the current study lightened that nearly one-fifth of the studied mothers used to wash the kitchen's surfaces (sinks, countertops, cutting boards, and walls) with hot water, soap, and disinfectants. This result agreed with **Ayaz, et al., (2018)**, who found that more than one-third of mothers clean the kitchen's surfaces with detergent and warm water. From the researcher's point of view, the low percent is due to the stipulate of using detergent, as a lot of mothers think that hot water and soap are enough to kill bacteria.

Regarding the relation between socio-demographic characteristics of mothers and their total knowledge about safe and unsafe food (**Table 4**) the present study highlighted that there was a highly statistically significant relation between socio-demographic characteristics of mothers and mother's knowledge in which  $P - \text{value} \leq 0.001$  except social status that showed that there was statistical significant relation in which  $P - \text{value} \leq 0.05$ .

Those findings are consistent with those of **Mohammed et al. (2019)** and the study conducted by **Shati, et al., (2021)** about "Knowledge, Attitudes, and Practices towards Food Poisoning among Parents in Aseer Region, Southwestern Saudi Arabia", who discovered a highly significant difference between knowledge score and (age and education) in which ( $p < 0.001$ ), because whenever

the mother has a good educational level, she almost always has good knowledge.

Conversely, those findings disagreed with **Ayaz, et al., (2018)** who found that there was no statistical significant relation between socio-demographic characteristics of mothers and their total knowledge about safe and unsafe food except the educational level that showed there was statistical significant relation in which  $P - \text{value} = 0.04$ .

Regarding the relation between socio-demographic characteristics of mothers and their practice regarding safe food (**Table 5**) the present study showed that there was a highly statistically significant relation between socio-demographic characteristics of mothers and mother's practices in which  $P - \text{value} \leq 0.001$  except social status that showed there was no a statistical significant difference in which  $P - \text{value} > 0.05$ .

Those findings are supported by **Bedada, et al., (2021)** who conducted a study about "Complementary Food Hygiene Practice among Mothers or Caregivers in Bale Zone, Southeast Ethiopia" and **kamal, et al., (2021)** who reported that there was a statistically significant relation between socio-demographic characteristics of mothers and their practices except social status.

Conversely, those findings disagreed with the study of **Zyoud, et al., (2019)** about "Knowledge, attitude and practices among parents regarding food poisoning: a cross-sectional study from Palestine" which found that there was no statistically significant relation between socio-demographic characteristics of mothers and their total practices about safe and unsafe, except for occupation and residence, which were statistically significant as  $P - \text{value} < 0.05$ .

Also, those findings disagreed with the study conducted by **Odonkor, et al., (2020)** about "Food safety practices among postnatal mothers in Western Ghana" which found that there was no statistically significant relation between socio-demographic characteristics of mothers and their total practices about safe and unsafe, except for age

and level of education, which were statistically significant as **P – value <0.05**.

Regarding the relation between mothers' knowledge and their practice (**Table 6**) the present study highlighted that there was a positive relation between mothers' knowledge and their practice in which **r = 0.754; P – value ≤ 0.001**.

This result in line with the study conducted by **Mihalache, et al., (2021)** about “Food safety knowledge, food shopping attitude and safety kitchen practices among Romanian consumers” which reported that there was a positive significant correlation between food safety knowledge and food attitude, in which (**r = 0.36; p < 0.001**).

Also, this finding was affirmed by **Chellaiyan, et al., (2018)** who found that there was a significant relationship between women's practice, and their knowledge, in which (**P < 0.05**).

Conversely, those results disagreed with the study conducted by **Zolfaghari, et al., (2019)** about “Food-borne diseases knowledge, attitude, and practices of women living in East Azerbaijan, Iran”, and **ElMezayen, et al., (2021)** who found that there was a negative relation between mothers' knowledge and their practice in which (**P – value > 0.05**).

### **Conclusion:**

Based on the findings of the current study, the following conclusions can be drawn: there was a statistically significant difference between mothers' socio-demographic characteristics and their knowledge about safe and unsafe food.

Also, the findings clarified that there was a statistically significant difference between mothers' socio-demographic characteristics and their practice regarding safe food for their children under five years, except for social status, and there was a positive correlation between mothers' knowledge and their practice regarding providing safe food for their children under five years old.

### **Recommendations:**

Health education programs regarding food handling should be implemented to increase mothers' awareness.

The public health sector should establish awareness campaigns directed at the general population regarding the measures that make food safe.

### **Future research:**

Future research includes a replication of the current study on a larger sample size to confirm the findings and make generalizations.

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