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Effect of Health Instructional Guidelines on Rural Mothers' Knowledge and their Preventive Practices Regarding FightingFood poisoning

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Abstract

Background: - *Food poisonings are emergency pediatric diseases that lead to significant morbidity and mortality. Ensuring integrity and appropriateness in handling, preparation, and storage of food by mothers are effective in prevent it.* ***The aim of the study was: -*** *to evaluate the effect of health instructional guidelines on rural mothers' knowledge and their preventive practices regardingfighting food poisoning.* ***Subjects and Method: -Study design: -*** *pretest – posttest study design was used in this study.* ***Study settings: -*** *This study was conducted in the biggest Rural Health Units that had the highest rate of population attendance in Ceberbay and shabshiervillages affiliated to the Ministry of Health in Tanta city, El-Gharbeya Governorate.* ***Study subjects: -*** *A convenient sample of 132 mothers who had children less than ten years attended the previous settings.* ***Tools of data collection****: - A structured interview schedule was developed by the researchers after reviewing the recent related literature. It consisted of two parts: - Part 1: Socio- demographic characteristics of the studied mothers. Part 2:- Preventive reported practices and knowledge of mothers with young children regarding food safety.* ***Results****: -the results of the present study revealed that more than half (50.2%) and nearly one-third (32.6%) of the studied mothers had a poor and fair level of knowledge pre intervention compared to the majority (87.9%) of them had a good level of knowledge regarding food safety post intervention. In addition,it was observed that (75.8 %) of the studied mothers had unsatisfactory reported practices pre intervention compared to (96.2 %) of them had a satisfactory practices post intervention.****Conclusion and recommendations: -There was improvement in mothers' knowledge and practices after health instructional guidelines implementation about food safety. Therefore, health instructional guidelines about food safety should be explained to all mothers in rural and urban areas.*

Keywords: - *Safetyfood, mothers practices, fighting poisoning, knowledge, rural area.*

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I. Introduction

Food is an essential basic biological need of human being andis thebase for good health because it supplies nutrients and energy for growth and development to the people. Food is also rich in nutrients required by microorganisms and may be exposed to be polluted withmain sources from dust, equipment, water, air, rodents, insects, sewage, and food handlers. As a result of changes in food production, handling, and preparation procedures as well as eating habits, the fact still that all the previous techniques have the direct influence on health. Hence, it is concerned with keep food free from infection[(1, 2)].

Non-proper food processing leads to many foodborne illnesses, whichraised from ingesting toxic chemicals or bacterial toxinsmaterial in an amount hurtful to the body through various ways[(2, 3)].Food poisoning is used as synonymous for foodborne diseases or foodborne illness, which is differentiated by the short incubation period, acute illness and clinical symptoms of mainly gastrointestinal upset. However, foodborne diseases are attributed to many of bacteria, parasites, viruses and poisonous chemicals [(4)].

Food poisonings are types ofemergency pediatric diseases with preventable sources thatlead to significant morbidity and mortality[(3, 5)]. Foodborne illness is a widespread childhood illness forever with other types of gastrointestinal diseases. Most children - if not all- will develop foodborne illness at some point in their childhood. Young children are considered at high risk for food poisoning than other population which can be attributed to an undeveloped immune system; reduce body weight, decrease stomach acid production, and lack of control over their own meal preparation [(6, 7)]. Their systems are not as effective at fighting off bacteria and viruses compared to an adult. Once children become infected, they can have a hard time getting well [(7)].

TheWorld Health Organization (WHO) announced that there about 2 million fatal cases of food poisoning take placeevery year globally, especially in developing countries [(8)]. The American Association of

Poison ControlCenters Toxic Exposure Surveillance System recorded that 65.8%of the 2.3 million reported poisoning cases are included offspring under the age of 19 years[3, 5].According to the Centers for Disease Control and Prevention, an estimated one in six Americans (or 48 million people) become sick, 128,000 are hospitalized, and 3000 die from foodborne diseases every year [9].The percentage of the population suffering from foodborne diseases each year is around 76 million cases, resulting in 325,000 hospitalizations and 5,000 deaths [10].

In Egypt, many studies was conducted to evaluate the epidemiology of poisoning at acute care setting such as Kafr El- Sheikh general hospital Al -Obour Insurance hospital, Ain- Shams Poison Control Center, and Tanta University Hospital &El-Menshawy General Hospital. All of them revealed that food poisoning is the most common pediatric poisoning[11,12, 13].

Food poisoning symptoms can start within hours to days after eating the contaminated food, last for (1to7) days after ingestion, and depend on the agent involved. It includes nausea, vomiting, diarrhea, abdominal pain, fever, headache, tiredness, dehydration, etc. Personal hygiene and good environmental, correct food preparation, handling, and proper food storage are basic preventive measures that can be taken to prevent food poisoning [2, 14, 15].

Food poising outbreaks were persistent, where the food worker error, bacterial proliferation, and important survival factors have been the participating factors in carrying foodborne diseases. Handling of food by a person either actively infected by or carrying a pathogen, inability to properly wash hands when it is necessary and insufficient cleaning of processing or preparation equipment or kitchen tools, contact with food with bare hands all of them are considered aserrors of food handlers, which are leading to food poisoning [16].

Food safety comprises allmeasures and conditions necessary to make sure integrityand appropriateness of food at all stages of the cycle of food production, that is, the process of handling, preparation, and storage of food, to prevent foodborne illness. Food handlers have been found to play distinguished roles in the conveyance of foodborne illness and can pose a significant people health problem because of their poor knowledge of safe food handling [17].

FightBAC! to educate consumers about safe food-handling practices was created by Partnership for Food Safety Education (PFSE). FightBAC! consists of four concepts: Clean, Separate, Cook, Chill [18, 19]. Healthy People (HP) 2010 was created by a coalition of government agencies to offer national goals for improving the health of people in the United States [19,20]. Recently, HP2020 listed objectives/ goals for the percent of consumers practicing safe food handling for the fourFightBAC! Concepts: Clean, "Wash hands and surfaces often," 74%; Separate, "Separate: don't cross-contaminate," 92% Cook, "Cook to the proper temperature," 50%, Chill, "Refrigerate promptly," 91% [19, 12].

The prevention of food poisoning can achieved through strict rules of hygiene that the mothers should applyat homes for preventing it. It consists of washing hands before handling the food or before cooking, serving or willing to eat the foods ;knowledge of prevention methods; avoiding over long storage of leftovers; separating foods while preparing and saving to prevent cross infection; washing the fresh vegetables and fruits with clean water; washing the dishes after use, rinsing them well in hot water, storing them clean and dry ; keeping the kitchen and cooking utensils clean and dry; preventing pets walking on food preparing surfaces; completely cooking food until it is piping hot to kill more microorganisms. So, the mothers need more knowledge about food hygiene and food safety measures and its acceptance [2, 19,22].

Community health nurse, who today has many tasks in terms of patient care, has great responsibility in family education especially for mothers whoconsidered the food handlers in the home and one of the most common sources of food borne illness. The role of mothers is ensuring food safety and hygiene for their infants and children at their homes[5, 2,14, 15].Particularly rural mothers who have low level of education, less access to health facilities, and at the same time they assumed the responsibility toward maintenance of health of their children and families[23,24].Therefore, this study was carried out to evaluate the effect of health instructional guidelines on rural mothers' knowledge and their preventive practices regarding fighting food poisoning.

Aim of the study:-

The aim of this study was to evaluate the effect of health instructional guidelines on rural mothers' knowledge and their preventive practices about fighting food poisoning.

Research hypothesis:-

Rural mother's knowledge and preventive practices regardingfighting food poisoning is expected toimprove after implementation of health instructions guidelines.

II. Subjects And Method

Subjects:

- **Study design**: - pretest – posttest study design was used in this study.
- **Study settings**:-This study was conducted in the biggest Rural Health Units that had the highest rate of population attendance in Ceberbay and shabshier villages affiliated to the Ministry of Health in Tanta city, El-Gharbeya Governorate.
- **Study subjects:** - A convenient sample of 132 mothers who had children under ten years and attended the previous settings for immunization of their children, seeking care for their children, laboratory investigations, ante natal and family planning services and were willing to participate in the study.
- **Tools of data collection :-**

Structured interview schedule was used by the researchers to obtain the necessary data.It developed by the researchers after reviewing the recent related literature. It consisted of two parts:-

Part 1: Socio- demographiccharacteristics of mothers and their food consumption:

Which included :- age, marital status, level of education, number of their children aged 10 years old and younger, frequency of meal preparation at home, frequency of meal consumption at a restaurant, food safety information sources and pervious attended health education and training about food safety and fighting food poisoning.

Part 2:- Rural mother's knowledge and reported practices regarding fighting food poisoning.

This part was developed by the researchers based on review of relevant current literatures [19,25-27]**.** It consists of two parts:-

a) Rural mother's knowledge regarding fighting food poisoning [25-27].

The total number of questions covering knowledge was 30 questions which divided into: seven for the clean (wash hands, food and utensils), eleven for the chill (refrigerate food promptly), six for the separate (separation raw and cooked foods) and six for the cook (cook foods at the appropriate temperature and length of time). Knowledge questions consisted of single-answer categorical questions and multiple-answer categorical questions. Correct answers take one and incorrect answers take zero.

The total knowledge scores of the studied mothers regarding food safetyand fighting food poisoning were 38, and classified into three categories as follows:

* Good knowledge: ≥ 70% of the total score (More than and an equal 26.6).
*Fair knowledge: 50 % - < 70 % of the total score (from 19 to less than26.6).
* Poor knowledge: < 50 % of the total score (less than 19).

b) Rural mother's reported practices regarding fighting food poisoning.

The total number of questions covering preventive practices was 57 questions, which divided into12 for the clean (wash hands, food and utensils), 17 for the chill (refrigerate food promptly), 11 for the separate (separation raw and cooked foods) and 17 for the cook (cook foods at the appropriate temperature and length of time).

A three -point Likert scale was assigned to all questions in the clean, separate, and cook concepts except the chill concept only nine questions were assigned a three -point Likert scale (always, sometimes, and never) coded from one to three, as: always= 3, sometimes =2, and never=1 in positive questions and always= 1, sometimes =2, and never=3 in negative questions.

While, other five questions ofthe chill concept were assigned a categorical scale (1 to 4 days and more than a week). Aright answer was take one and awrong answer take zero.

The total scores of reported preventive practices of the studied women regarding fighting food poisoning were (161) and classified into two categories as follows:

*Satisfactory practices: - ≥ 70% of the total score (more than or equal 112.7).
*Unsatisfactory practices: -< 70 percentage of the total scores(less than 112.7)

Method

1. An official permission to conduct the study was obtained through sending an official letter from the Dean Faculty of Nursing, Tanta University to the directorate of Health Affairs. Then an official permission from the directorate of Health Affairs to the manager of each Rural Health Unit in Cebrbay and Shabshier El-hasa villages rural areas in Tanta city and informed them about the study's objectives to gain their cooperation.
2. Ethical and legal considerations: - An informed consent for participation in the study was obtained from the entire subjects after explanation of the nature and purpose of the study to them. Nature of the study was

not causing any harm and /or pain for the entire subjects. Confidentiality and privacy were put into consideration regarding the data collected.

3. The study tool part (1 and 2) was developed by the researchers after review of relevant current literature.

4. Face and content validity of the study tool was tested by jury of five experts in the field of the study and their opinion and suggestion had been taken into the consideration.

5. Pilot study was conducted on 20 mothers who were chosen randomly from the selected settings for testing the tool for its clarity, applicability and identified obstacles that may be encountered during data collection and was excluded from the study subjects and necessary modification was done.

6. The reliability test of the tool was done by using test of Cronbach's Alpha which was 0.809 for knowledge of mothers with young children regarding food safetyand fighting food poisoning and 0.793 for reported preventive practices of mothers with young children regarding food safety and fighting food poisoning.

7. Field work :- The study was conducted through four phases:

I. Assessment phase:

- Thedata was collected by the previously mentioned tool through interviewing each mother individually in predetermined settings to collect the baseline data as a pre-intervention assessment.

II. Planning phase:

- A health instructions guidelines were planned based on the mothers' needs, and relevant literature review related to fighting food poisoning and food safety.

a. <u>Setting the objectives of the health instructions guidelines:</u>

- General objective of the health instructions guidelines: was to empower knowledge and preventive practices of rural mothers regarding fighting food poisoning and food safety
- Specific objectives of the health instructions guidelines: At the end of all sessions each mother was able to:-
  - Use safe water and cooked materials
  - Wash hands before contact with food
  - Cook foods for the appropriate length of time and temperature.
  - Separate raw and cooked foods correctly
  - Store food at the proper temperature
  - Prevent contaminating food with pathogens spreading from peopleand pests.

b. <u>Preparing the teaching strategies and materials:</u>

- Teaching strategies: were lectures by the researchers, group discussion for expressing mother's experience, questions answering, and skill training.
- Teaching materials: were included power point presentation, videos, posters, and guide booklet. All of them had been written in a simple Arabic language and supplemented by photos and illustrations to help the study subjects in understanding of the content simply.

III. Implementation phase:-

- The health instructions guidelines were implemented to the study subjects two days per week in the selected rural health units.
- The sessions of the health instructions guidelines were carried out with the duration of each session approximately 30- 45 minutes.
- The health instructions guidelines were conducted by using the previously mentioned teaching strategies and materials.
- The health instructions guidelines content was explained throughout the following five sessions to cover its general and specific objectives.

○ **<u>Session</u> (1): Pre-test & orientation about the health instructions guidelines.**

The aim of this session was to orient the study subjects about the importance of the intervention, its sessions, expectation of each session, and then conducting the pretest before starting the program.

○ **<u>Session</u> (2): Cleaning hands, food, and utensils.**

The aim of this session was to motivate rural mothers to actively washhands before preparing food, before eating, after contact with row meat and pets. Also, to inform them the importance of hand washing of their children before eating, after toilet and contact with pets, and good washing of fruits and vegetables before eating.

○ **<u>Session</u> (3): Right way of cooking food.**

The aim of this session was to help mother follow the right way of cooking meat, eggs and chicken and how to test its maturity to be ready for eating.

○ **<u>Session</u> (4): Separation of row and cooked food.**

The aim of this session was to inform mothers the importance of separation of row and cooked meat and row meat from other food and how separate row meat in refrigerator.

- **Session (5):Right way of storage food.**

The aim of this session was to enable mothers how to keep row eggs and meat, large quantities of food and time allowed for storage row eggs, chicken and boiled egg, soap, meat and breads in refrigerator for eating .

IV. Evaluation phase:

- The aim of this phase was to evaluate the effectiveness of the health instructions guidelines on empowering knowledge and preventive practices of rural mothers about fighting food poisoning
- The interview sheet was filled from mothertwotimes: Before the intervention, andtwo months after the implementation of intervention.

III. Results

Table (1): Distribution of the studied rural mothers according to their socio-demographic characteristics

Variables	The studied subjects (N=132)	
	n	%
Age in years		
20 - 29	64	48.5
30 - 39	56	42.4
≥ 40	12	9.1
Range	**(20-44)**	
Mean±SD	**30.91±6.207**	
Level of education		
▪ Illiterate	5	3.8
▪ Read and write	11	8.3
▪ Elementary school	10	7.6
▪ Secondary education	50	37.9
▪ Average Institute	11	8.3
▪ University education	45	34.1
Working status		
▪ Work	37	28.0
▪ Housewife	95	72.0
Number of children equal or less than 10 years		
▪ One	59	44.7
▪ Two	50	37.9
▪ Three and more	23	17.4
Preparation of food at home		
▪ Never	3	2.3
▪ All time	69	52.3
▪ Nearly all time	38	28.8
▪ Sometimes	22	16.7
Number of meals children had gotten outside the home		
▪ Never children had gotten meals outside the home	82	62.1
▪ One meal weekly	33	25.0
▪ From 2 to 3meals weekly	17	12.9

Table (1) represents the distribution of the studied rural mothers according to their socio- demographic characteristics**.** It shows that their age was ranged from (20-44**)** years with mean 30.91±6.207 years. More than one - third of mothers (37.9% and 34.1%) had secondary and university education and nearly three - quarters (72.0%) were housewives while, more than half (52.3%) of them were preparing food all time at home for their children. The table also showed that slightly less than two-thirds (62.1%) of the studied mother reported that their children never had gotten meals outside the home.

Figure (1) Distribution of the rural mothers according to their preferred sources of knowledge regarding food safety and fighting food poisoning.

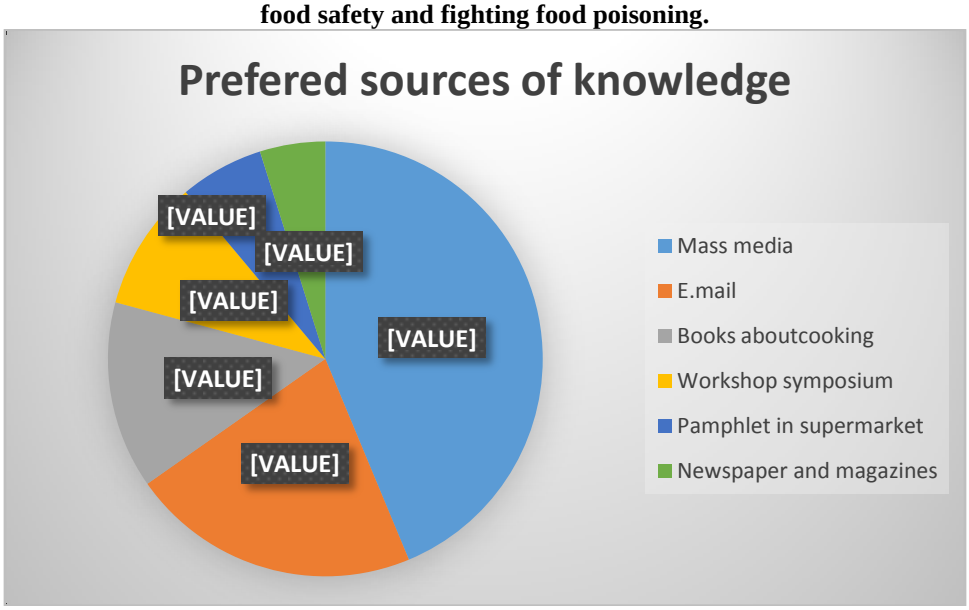

Figure (1): represents the distribution of the studied rural mothers according to their preferred sources of knowledge regarding food safety and fighting food poisoning. It shows that about half (47.7%) of mothersthemost preferred source for information was mass media and only 5.3% of them preferred newspaper and magazines.

Table (2) Distribution of the rural mothers according to their knowledge of regarding food safety and fighting food poisoningconcepts pre and post intervention

Variables		Mean ± SD	Range	Paired T-test	
				T	P-value
▪ Clean concept (0-7)	Pre	5.14±1.612	(1-7)	-3.226-	0.002*
	Post	5.64± 0.514	(4-6)		
▪ Chill concept (0-14)	Pre	5.78± 2.648	(3-13)	-19.592-	0.000*
	Post	11.47± 1.646	(6-13)		
▪ Separate concept (0-11)	Pre	6.06± 1.228	(3-11)	-18.344-	0.000*
	Post	9.30± 1.803	(5-11)		
▪ Cook concept (0-6)	Pre	2.45± 1.846	(0-6)	-16.996-	0.000*
	Post	5.47± 0.786	(2-6)		
▪ Total score of knowledge (0-38)	Pre	19.45± 5.686	(9-35)	-19.691-	0.000*
	Post	31.88± 4.253	(19-37)		

Table (2) represents the distribution of the studied rural mothers according to their knowledge regarding food safety and fighting food poisoningconcepts pre and post intervention.It was observed that there was a statistically significant improvement in mean score of knowledge of the studied mothers at all conceptsof knowledge regarding food safety and fighting food poisoning(clean, chill, separate and cook concepts) from pre to post intervention (**P=<0.05**).

Table (3) Distribution of the rural mothers according to their reported practices regarding food safety and fighting food poisoningconcepts pre and post intervention

Variables		Mean ± SD	Range	Paired T-test	
				T	P-value
▪ Clean concept (12-36)	Pre	27.24± 1.726	(23-33)	-42.061-	0.000*
	Post	35.51± 1.705	(26-36)		
▪ Chill concept (12-41)	Pre	25.85± 2.943	(18-29)	-6.096-	0.000*
	Post	27.65± 2.086	(22-36)		
▪ Separate concept (11-33)	Pre	20.57± 2.353	(16-25)	-15.626-	0.000*
	Post	25.85± 2.943	(18-29		
▪ Cook concept (17-51)	Pre	33.17± 4.637	(17-40)	-12.632-	0.000*
	Post	40.25± 4.392	(22-45)		

▪ **Total score of reported practices (52- 161)**	**Pre**	108.64± 7.197	(82-121)	-31.124-	0.000*
	Post	145.52±12.671	(102-141)		

Table (3): represents the distribution of the studied rural mothers according to their reported practices regarding food safety and fighting food poisoningconcepts pre and post intervention.It was observed that there was a statistically significant improvement in mean score of reported practices of the studied mothers at all parameters of practices food safety and fighting food poisoningconcepts (clean, chill, separate and cook concepts) respectively from pre to post intervention (**P=<0.01**).

Table (4) Distribution of the rural mothers according to their level of knowledge and level of their reported practices regarding food safety and fighting food poisoning pre and post intervention

Variables		**The studied subjects (N=132)**		**Z P**
		n	**%**	
Level of knowledge				
- Poor knowledge	**Pre**	71	53.8	9.719 0.000*
	Post	1	0.8	
- Fair knowledge	**Pre**	43	32.6	
	Post	15	11.4	
- Good knowledge	**Pre**	18	13.6	
	Post	116	87.9	
level of practices				
- Unsatisfactory practices	**Pre**	100	75.8	9.967 0.000*
	Post	5	3.8	
- Satisfactory practices	**Pre**	32	24.2	
	Post	127	96.2	

Table (4): represents the distribution of the studied rural mothers according to their level of knowledge and level of their reported practices regarding food safety and fighting food poisoning pre and post intervention.**I**t was observed that the half (50.2%) and one-third (32.6%) of the studied mothers were had a poor and fair level of knowledge per intervention compared to the majority (87.9%) of them were had a good level of knowledge regarding food safety and fighting food poisoningpost intervention.The table also reveals that there was a statistically significant difference in mothers knowledgeregarding food safety and fighting food poisoningpre and post intervention (Z= (9.719) P= (<0.01)).

As regarding to level of their reported practices it was observed that three quarters (75.8 %) of the studied mothers were had an unsatisfactory practices per intervention compared to (96.2 %) of them had a satisfactory practices post intervention.In addition, the table showsthat there was a statistically significant difference in mothers reported practices regarding food safety and fighting food poisoningpre and post intervention (Z= (9.967) P= (<0.01)).

Table (5) Correlation betweendomains (concepts) of knowledge and reported practices of the rural mothers regarding food safety and fighting food poisoningconcepts pre intervention

Variables	**Score of practices of clean concept**		**Score of practices of chill concept**		**Score of practices of separate concept**		**Score of practices of cook concept**		**Total Score of practices**	
	r	**P**	**r**	**P**	**R**	**P**	**r**	**P**	**r**	**p**
- **Score of knowledge of clean concept**	0.333	0.000**	0.151	0.084	0.029	0.754	-0.033-	0.707	0.129	140
- **Score of knowledge of chill concept**	0.591	0.000**	-0.033-	0.710	0.227	0.009**	-0.136-	0.120	0.114	0.191
- **Score of knowledge of separate concept**	0.202	0.020*	0.188	0.030*	0.081	0.359	-0.080-	0. 364	0.100	0.254
- **Score of knowledge of cook concept**	0.337	0.000**	0.093	0.291	0.106	0.225	-0.166-	0.057	0.046	0.599
- **Total Score of knowledge**	0.524	0.000**	0.099	0.259	0.169	0.052	-0.143-	0.102	0.129	0.141

****. Correlation was significant at the 0.01 level (2-tailed).**
***. Correlation was significant at the 0.05 level (2-tailed).**
Table (5) reveals correlation betweendomains (concepts) of knowledge and reported practices of the studied subjects regarding food safetyand fighting food poisoning pre intervention. The table shows that there was statistically highly positive correlation between score of practice of clean concept and score of knowledge of clean chill, separate and cook concepts and total score of knowledge (P <0.01).

Table (6):Relationship between socio-demographic characteristics of the rural mothers and their total score of knowledge and reported practices regarding food safety and fighting food poisoning

Variables	Total knowledge score(0-37)		Total practices score (57 – 151)	
	Pretest	Posttest	Pretest	Posttest
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age in years: • 20 - 29 • 30 - 39 • ≥ 40	18.61±5.653 20.23±5.695 20.25±5.643	31.84±4.134 31.59± 4.548 33.42± 3.343	109.781±6.665 104.910± 5.896 100.083±8.670	129.937±7.495 128.214±7.738 130.500±10.917
F , P	**1.356,0.261**	**0.915,0.403**	**15.255 ,0.000***	**0.864,0.424**
Level of education ▪ Illiterate ▪ Read and write ▪ Elementary school ▪ Secondary education ▪ Average Institute ▪ University education	12.36±1.206 16.00±3.098 16.60±6.077 18.16±4.900 23.60± 4.336 23.62±4.324	31.56 ±3.759 30.00±6.099 30.10±4.358 33.60±3.362 35.36±2.111 32.04± 4.317	103.000±7.912 105.820±7.945 105.300±4.2176 109.200±7.049 115.909±6.609 106.755±5.139	123.400±14.275 127.636±9.510 126.700±6.832 127.360 ±8.257 136.727 ±4.221 131.155±5.583
F , P	**17.189,0.000***	**2.646,0.026***	**5.197,0.000***	**4.379,0.001***
Working status ▪ Work ▪ Housewife	22.62±5.225 18.21±5.393	31.22±3.938 32.14± 4.363	104.270±6.340 107.831± 7.339	129.189±5.581 129.284±8.710
t , P	**4.257,0.000***	**-1.118-,0.266**	**-2.597-, 0.010***	**-0.062-,0.951**
Number of children equal or less than 10 years ▪ One ▪ Two ▪ Three and more	20.00±5.922 18.78±5.957 19.48±4.378	31.75± 4.389 32.34 ±4.064 31.22± 4.379	107.186±7.767 107.980±7.308 103.434±4.230	128.661±8.295 130.280±8.236 128.565±6.229
F , P	**0.620,0.540**	**0.597,0.552**	**3.357, 0.038**	**0.666,0.516**

* Significant at P < 0.05

Table (6) shows Relationship between socio-demographic characteristics of the rural mothers and their total score of knowledge and reported practices regarding food safety and fighting food poisoning. Concerning the age, it was found that the studied subjects who were aged ≥ 40 years old gained the highest total mean score of knowledge (20.25±5.643 and32.04± 4.317 respectively and practices (100.083±8.670 and 130.500±10.917respectively) scores pre and post implementation of instructions guidelines).This difference in the total score of practices pre intervention was statistically significant between different age groups. In relation to the level of education, the table reveals that average institute subjects gained the highest total mean score of knowledge (23.60± 4.336 and 35.36±2.111) respectively and practices (115.909±6.609 and 136.727 ±4.221respectively) scores pre and post implementation of instructions guidelines).This difference in the total mean score of knowledge and practices pre and post intervention was statistically significant. Regarding working status of the studied rural mothers, the table reveals that there was statistically significant difference of the total mean score of knowledge and practices pre intervention between working and housewife women. However, there was no statistically significant difference in related to number of children equal or less than 10 years.

IV. Discussion

World Health Organization (WHO 2015) indicates that food borne and waterborne diarrheal disease kills an estimated 2 million people annually. Evidence also suggests that, food is equal to and may be more important than water as a route of transmission of diarrhea in developing countries [28, 29]. As estimated by WHO, more than 30–40% of food borne diseased cases were happened at home. Food borne diseases are continuously expanding and the quantity of reported cases is underestimated because of the absence of outbreak reports in the home setting [30]. Therefore, the aim of the current study was to evaluate the effect of health instructional guidelines on rural mothers' knowledge and preventive practices regarding food safety to fight food poisoning.

Socio-demographic characteristics are important risk factors in developing many diseases particularly foodborne diseases and food poisoning. The result of present study revealed that, the age of the studied rural mothers was ranged from (20-44**)** years with mean 30.91±6.207 years. This age group of women constitutes most of those who seek the rural health units' services either for themselves or for their children. This result is similar with ***Adebowaleet al., (2017)***[31] who found that, the majority of their participants were within age group 23-42 years old. On the other hand,***Klontz et al., (2009)***[32], reported that the age of 41% of their studied subjects was below 30 years.

In relation to level of education, slightly more than one - third of the studied rural mothers had secondary and university education. This results is in agreement with ***Yeganeh et al., (2017)*****[33]**who mentioned that themost of their participants had high school (41%) and university education (43.3%). But this result is contradicted with ***Bas et al. (2006)*****[34]**who mentioned that 46.6% of the studied subjects had primary education. Regarding to rural mothers' occupation, the present study result showed thatnearly three - quarters were housewives. This is in the same line with***Mananga et al. (2014)*****[35]** who found that, housewives and agriculture were the main occupations representing 43.44% and 26.64% respectively.

There is evidence that comprehensive programs which include mass media campaigns can be effective in raising knowledge and even improving behavior [36]. In relation to preferred sources of rural mother's knowledge about food safety and fighting food poisoning, the result of present study showed that slightly less than half of mothersreported thatthemost preferred source for information for them was mass media. This result may be justified as most of the studied mothers were housewives and spent most of their times via following all forms of media, in turn they gain health and non-health information through it. This result is in agreement with the result of ***AwadAllah M, et al., (2017)***[37] who study the knowledge, attitude and practice of female teachers regarding safe food handling in Zagazege , Egypt, and found that,teachers gained their safe food handling knowledge from the mass media. In addition, this result was in the same line with ***Sudershan et al. (2008)*****[38],** who reported that 76% of mothers received their information about food safety and hygiene from TV and mass media.

The importance of knowledge in health education must not be ignored, as improvement in knowledge is the first step toward health behavior modification, so many studies incorporated knowledge in their intervention programs [39-41]. The result of present study reveals that there was a statistically significant improvement in mean score of knowledge and reported practices of the studied mothers regarding the four concept related to food safetyand fighting food poisoning(clean, chill, separate and cook) respectively from pre to post intervention (**P=<0.05**). This result may be attributed to the educational guidelines that provide mothers with the accurate information, which enable them to follow proper food safety measures. This is in agreement with***AwadAllah M et al.,(2017)*****[37]** who found that Knowledge about safe food handling of their studied sample had highly significant improvement ($p<0.01$) after intervention. In addition, ***Bas et al., (2006)***[34] who evaluated food hygiene knowledge, attitudes, and practices of food handlers in food businesses in Turkey, revealedthat, total score about food safety knowledge was higher in trained food handlers (45.8 ±17.6) than untrained (40.8 ± 14.3) ($P < 0.05$).Also***Riazet al.,(2016)*****[42]** found that mean scores of both knowledge and practice on food safety were increased significantly by 1.9 and 1.6, respectively after the intervention**.**

In the same context, ***Raphael B, et al., (2018)***[43] who assessed the domestic food hygiene practices in a rural area of Thrissur district, kerala, india, revealed that, just less than half of the participants always washed their hands before and during food preparation, or used separate utensils and cutting boards for preparing raw and cooked food items**.** Moreover, ***Adesokan et al (2015)*****[44]** noted significant change in knowledge and practice of safe food handling but with repeated short term training.

As regards the studied rural mothers according to their level of knowledge and level of their reported practices regarding food safety and fighting food poisoningpre and post intervention**,**the result of the present study showed that, half and one third of the studied mothers were had a poor and fair level of knowledge per intervention compared to the majority of them who had a good level of knowledge regarding post intervention. This is agree with***Awad Allah et al., (2017)***[37] who found that a significant rise in the satisfactory level of knowledge and attitude was noticed after educational program.

In relation to level of rural mother reported practices, the result of present study showed that three quarters of the studied mothers were had an unsatisfactory practices per intervention compared to the majority of them had a satisfactory practices post intervention. In addition, there was a statistically significant difference in mothers reported practices regarding food safety and fighting food poisoningpre and post intervention (Z= (9.967) P= (<0.01)). This is in agree with ***Riaz et al.,(2016***)[42] who revealed that a significant increase in good practice regarding food safety from 30% at baseline to 47% after intervention and disagree with ***Awad Allah et al.,(2017***)[37] who found that there is no significant change in practice level after program intervention p= (>0.05).

Socio-demographic characteristics affect the willingness and ability to learn new information or skills. The result of the present study revealed that, mothers' total score of knowledge and practices increased with their ages. This may be due to exposure for many situations and more experiences, which improved their ability to receive knowledge easily. This result agreed with ***Yeganeh et al. (2017)***[33] who studied mothers' knowledge and attitude toward food security in complementary feeding and found that, there was a significant relationship between mothers' knowledge and age which can be due to increase in experience and nutritional learning. In addition, ***Sanlier (2009)*****[45],** reported that food safety knowledge and practices tends to increase with age of the studied subjects.

The mother's higher education level is among the positive factors affecting their knowledge and practices regarding to food safety [46]. The result of the present study showed that there were statistically significant relations between mothers' educational level and their knowledge and practices regarding to food safety. These findings were in agree with *Omemu et al., (2011)*[47]who found that the educational level of the studied mothers had significant implications for their child's health in general and for food hygienic behavior and their attitude in particular.

The high prevalence of food borne illness at home could be attributed to poor food hygiene and preparation due to poor awareness of properpractices.Continuous effort should be made to help mothers particularly rural ones to adhere to food safety measures that enable them to fight food poisoning. This can be achieved through organization and implementation of educational guidelines about food safety concepts within the rural units, schools, MCH and everywhere mothers can be found. Proper food hygiene and safety measures will help our new generation enhancing their health, academic performance and relations with the outside environment.

V. Conclusion

Based on the findings of the present study, it can be concluded the health instructional guidelines on rural mothers' knowledge and reported preventive practices regarding food safety and fighting food poisoningwere effective and improved their knowledge and preventive practices.

VI. Recommendations

Based on findings of the present study, the following recommendations were suggested:-

1- Nurses working at MCH and rural health units have to arrange health education for mothers regularly about food safety and fighting food poisoning.
2- Illustrated booklets, containing food poisoning knowledge and hygienic practices should be available in each primary care unit and health center.
3- Continuous educational camping for rural mothers regarding food hygiene and food poisoning through medical staff should be provided.

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