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Original Article

Knowledge and Practices of Mothers Regarding Food Safety Presenting to Family Medicine Clinics at a Teaching Hospital in Karachi Pakistan

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Abstract

Background:.To assess the knowledge and practices of mothers regarding food safety presenting to family medicine clinics of a teaching hospital in Karachi, Pakistan.

Methods: In this cross sectional study 240 mothers, having children under five years of age, were selected through non probability consecutive sampling. A pretested structured questionnaire on knowledge and practices of food safety was used with face-to-face interviews.

Results:Adequate knowledge was found in 82.5% and correct practices in 75.8% of mothers. Frequency of adequate knowledge and correct practices were more among those with higher education (p=0.028 and p= 0.001) respectively. Factors significantly associated with practices regarding food safety were age (OR: 0.57, 95% CI: 0.312-1.04) and education. (OR: 0.178, 95% CI: 0.02-1.1). Most of the mothers were 25-30 years of age(37.9%). Most of the mothers (83.8%) were housewives. Majority (69.2%) have completed higher education. Food ingredients ,before purchasing, were checked by 44.6%,while 34.2% tasted food by fingers. Only 55.4% knew that boiled water is safe for drinking and cooking purposes.

Conclusion: Inadequate knowledge regarding food safety was seen in 17.5% mothers and 24.2% have incorrect practices regarding food safety,which is significant.

Key Words: Knowledge, Practices, Food safety

Introduction

Food safety is an international concern. Food-borne illnesses are defined as diseases, either infectious or toxic in nature, caused by agents that enter the body through the ingestion of food.[1] Majority of the food borne diseases can be prevented if principles of food protection are followed . According to World Health Organization (WHO), 1.8 million children die each year from diarrheal diseases. Majority of these being caused by the contamination of food and drinking water.[1] In the United States, the Center of Disease Control and Prevention (CDC) estimated that each year, the burden of food-borne illnesses is approximately 47.8 million cases, leading to more than 128,000 hospitalizations and 3,000 deaths.[2]

Food-borne diseases are causing a rise in social and economic burden globally.[3]In Europe, about one third of the food borne illness cases were related to the home, with more than half of Salmonella outbreaks detected at home.[4] It has been determined by studies that around 50 to 87% of the reported outbreaks of food-borne diseases develop from homes.[5]

In a study done in Italy by Conter M et al reported that 74.4% of the consumers accepted that the food management at home is important.[6] A case study conducted in Hyderabad, India on mothers of children less than 5 years reported a high incidence of food-borne illnesses in the families (21%) and community (12%).[7,8]

Household member at the extreme of age i.e. small children and older people are especially more prone to food-borne diseases. In children, the increased risk is because of their immature immune system, low bodyweight and limited control over meal preparation.[9] Mothers play a great role in food safety, as they are the last line of defense against food-borne illnesses.[10]

A study done on food safety knowledge among women of Khartoum city of Sudan reported that 51.9% of the participants knew that certain diseases are caused by contaminated food which included gastrointestinal diseases, cholera, salmonella and hepatitis A.[11]An Egyptian study showed that the mean score percentage of total food safety knowledge of working women to be 67.4 while total score for

practices was found to be 72.[12] A study done on Jordanian households found that food hygiene and attitudes of the household meal preparers were satisfactory.[13]

A study was conducted on food safety knowledge and practices among Saudi women reported higher mean knowledge and practices (63.4% and 73.8% respectively) in personal hygiene while lowest mean knowledge score was reported in utensils and equipment and lowest mean practice in cooking (49.8%).[14] A study done in Peshawar , by Khattak et al on nutritional knowledge of mothers reported that boiled water was used by 46.6% mothers, filtered water by 13.3% while 40% mothers used tap water for children under five years.[15] A study done in Civil Hospital Karachi showed that only 14.5% mothers knew about boiling of water for prevention of diarrheal diseases.[16] Effective measures to decrease the health risks caused by food-borne illnesses require a big cost to both public and household finances.[17] However simple measures like hand hygiene practiced at home level can contribute effectively with minimum cost.

Subjects and Methods

This was an analytical cross sectional study conducted from January to July 2015 at Family Medicine clinics of Aga Khan University Hospital Karachi. Sample size was calculated with WHO software for sample size determination. A total of 240 mothers aged 18 to 45 years and having children under five years of age were enrolled in the study via non probability consecutive sampling. Written informed consent was obtained from the participants after explaining about the study. Standard measures were taken to ensure confidentiality of participants. A 10-15 minute,pilot tested, coded questionnaire was filled by the Principal Investigator. The questionnaire formulated was based on the data gathered from similar studies conducted in Africa and Middle East.[12-14]The questionnaire consisted of three sections. Section 1 contained demographics including age, occupation, number of children, education and socioeconomic status, while Section 2 and section 3 consisted of questions pertaining to assess their knowledge about the food safety along with their practices regarding food safety. The knowledge and practices were assessed through questions regarding food purchasing, food handling, food preparation/cooking and food storage. The questionnaire included 46 items .Each correct response got a score of "1" while every wrong answer was scored as "0". Results were presented as percentages. Educational material on the food safety was provided to the mothers after filling the questionnaires to educate them regarding food safety. For continuous variables such as age, mean and standard deviation were reported. For categorical variables such as educational status of mother, number of children under five, family system, knowledge and practices about the food safety, frequencies and proportions were reported. The outcome variables i.e. knowledge and practices of mothers regarding food safety were calculated to fulfill the objectives. All the correct answers were calculated as percentages.A multivariable logistic regression analysis was performed to assess the independent effect of all demographic variables (age, occupational status, education, no. of children etc.) on the knowledge and practices regarding food safety in the form of adjusted odds ratio and their 95% confidence interval. All of the analyses was two tailed, and *p* values of 0.05 or less was considered statistically significant. The study was approved by an Institutional Ethical Review Committee [ERC] of the Aga Khan University [AKU].

Results

Socio-demographic factors of the participants showed that most of the mothers (37.9%) were 25-30 years of age. Out of 240 mothers, 83.8% were housewives. Majority (69.2%) had completed higher education. Majority (56.7%) lived in joint family and belonged to high socio-economic status (65%). Inadequate knowledge was seen in 57.1% of mothers aged <30 years,while 84.3% had adequate knowledge. Equal proportion of the mothers (69%) had adequate and inadequate knowledge (Table 1). About half (51.6%) of the mothers had correct practices having age $\geq$ 30 years of age. However, 58.6% (n=34) of the mothers had incorrect practices who belonged to high socioeconomic status. Frequency of correct practices were more among mothers with high education 72% (p=0.004) (Table 2). Majority (55.4%) knew that safe water for drinking and cooking purposes is boiled water. Most (96.3%) of the house wives had knowledge that attention should be paid to the cleanliness of the store from where food is purchased. Majority (88.3%) had a habit of washing hands with soap and water before preparing and eating food at home (Table 3). As none of the variables were statistically associated (univariate criteria >0.25) with knowledge regarding food safety.So,multivariate regression analysis was not done.Age in years and education had a protective effect for practices related

to food safety, however only two variables i.e. age in years and education were statistically significant.

Table 1: Factors associated with knowledge of mothers regarding food safety (n=240)

Variable	Knowledge Adequate No (%)	Knowledge Inadequate No (%)	Unad-justed OR	95% CI	P-Value
Age					
<30 years	100(50.5%)	24(57.1%)	Ref(1)		0.435
≥30 years	98(49.5%)	18(42.9%)	0.76	0.39-1.49	
Occupation					
Housewife	167(84.3%)	34(81%)	Ref(1)		
Working	31(15.7%)	8(19%)	1.268	0.53-2.99	0.589
Education*					
Primary	5(2.5%)	0	Not significant		0.028
Secondary	22(11.1%)	0			
Intermediate	34(17.2%)	13(31%)			
Higher	137(69.2%)	29(69%)			
No of Children					
1	66(33.3%)	12(28.6%)	Ref(1)		
2	76(38.4%)	15(35.7%)	2.40	0.81-7.08	0.412
3	40(20.2%)	8(19%)	2.217	0.77-6.31	
>3	16(8.1%)	7(16.7%)	2.187	0.68-7.03	
Family Type					
Joint	116(58.6%)	20(47.6%)	Ref(1)		
Nuclear	82(41.4%)	22(52.4%)	1.556	0.798-3.03	0.195
Socioeconomic Status					
Low	11(5.6%)	3(7.1%)	Ref(1)		
Middle	56(28.3%)	14(33.3%)	0.63	0.163-2.47	0.687
High	131(66.2%)	25(59.5%)	0.77	0.37-1.60	

*Variables significant at chi square-P value<0.05

Table 2. Factors associated with practices of mothers regarding food safety (n=240)

Variable	Correct Practices No (%)	Incorrect Practices No (%)	Unadjusted OR	95% CI	P-Value
Age					
<30 years	100(50.5%)	24(57.1%)	Ref(1)		0.07
≥30 years	98(49.5%)	18(42.9%)	0.57	0.312-1.04	
Occupation					
Housewife	167(84.3%)	34(81%)	Ref(1)		
Working	31(15.7%)	8(19%)	1.28	0.59-2.78	0.520
Education					
Primary	5(2.5%)	0	Ref(1)		0.004
Secondary	22(11.1%)	0	0.178	0.02-1.1	
Intermediate	34(17.2%)	13(31%)	5.61	0.72-0.43	
Higher	137(69.2%)	29(69%)	0.394	0.19-0.78	
No of Children					
1	66(33.3%)	12(28.6%)	Ref(1)		
2	76(38.4%)	15(35.7%)	2.06	0.47-5.72	0.58
3	40(20.2%)	8(19%)	1.67	0.62-4.47	
>3	16(8.1%)	7(16.7%)	1.6	0.54-4.7	
Family Type					
Joint	116(58.6%)	20(47.6%)	Ref(1)		
Nuclear	82(41.4%)	22(52.4%)	1.08	0.59-1.96	0.79
Socioeconomic Status					
Low	11(5.6%)	3(7.1%)	Ref(1)		
Middle	56(28.3%)	14(33.3%)	0.62	0.18-2.16	0. 497
High	131(66.2%)	25(59.5%)	0.71	0.37-1.35	

Table 3.Knowledge and practices regarding food safety (n=240)

Question	Correct Knowledge (%)	Correct Practices (%)
Food Purchasing		
Checking expiry dates of food	98.8%	94.6%
Checking ingredients of food packages	97.1%	44.6%
Ensuring cleanliness of sites of purchasing and preparation of food	96.3%	99.2%
Checking for nutritional values and damaged packages	79.6%	96.3%
Food Handling		
Use of same cutting boards for raw and cooked foods	60.8%	54.6%
Washing of fruits and vegetables before usage	100%	99.2%
Appropriate storage of chicken, fish, vegetables and raw meat	61.3%	62.1%
Food Preparation		
Appropriate hand washing with soap and water	93.8%	88.3%
Preparation of food during illness	63.3%	29.6%
Safe water for drinking and cooking purposes	55.4%	43.8%
Food Storage		
Storage of cooked food	34.2%	58.3%
Storage of raw food	83.3%	90.8%

Table 3: Knowledge and practice of mothers

	Adequate	Inadequate
Knowledge regarding food safety	189(82.5)	42(17.5)
Practice regarding food safety	182 (75.8)	58(24.2)

Discussion

The incidence of food-borne illnesses is rising worldwide and it is causing losses economically due to low work yield, increasing number of hospital admissions and other health related cost.[18]Unfortunately Pakistan has poor record regarding formulating and implementing strict food safety laws. Food safety is an important public health issue, all over the world, but particularly among developing countries like Pakistan.[1]The reason behind this is the existence of different food-borne diseases caused by the use of infected food and water.

Increase in the prevalence of known pathogens along with emergence of new pathogens is causing a rapid

change in the epidemiology of food-borne diseases.[19] The food-borne pathogens include different bacteria, helminthes and protozoa. The most common bacteria include Salmonella, Campylobacter, Escherichia coli, Llisteria monocytogenes, Yersinia enterocolotica, icereus.[20]

This study showed that out of 240 mothers, 198 (82.5%) mothers had adequate knowledge, while 182 (75.8%) had correct practices. These results are compatible with those of Indian mothers.[7] Another study done on Saudi women in 2012 showed overall knowledge 61.3% and practices 67%.[14] These results denote that there is a gap between adequate knowledge (82.5%) and correct practices (75.8%) revealing that having adequate knowledge does not always translate into correct practices.

In present study it was observed that education had a significant association with both knowledge (p=0.028) and practices (p=0.001). Majority of the mothers with higher education had adequate knowledge and correct practices. This finding is, again, consistent with the studies conducted in India and Saudi Arabia, which also reported significant association between literacy and food safety practices.[7,14]

Another significant association was seen between the age of the mothers and food safety practices (OR=0.57, 95% CI=0.312-1.04). The reason behind this could be that as age advances mothers get more experienced.

If we consider the various aspects of food safety individually, it is seen that 39.2% of the studied mothers were unaware that they should not use the same cutting boards for raw and cooked food. While in practice 45.4% used the same cutting boards for raw and cooked food. It has been assumed that the use of same cutting boards for raw and cooked food of animal and vegetable origin without proper washing can be one of the causes of food poisoning.[12]

Repeatedly tasting food by hand leads to the transfer of germs from the hand and mouth to the food with the potential to cause illness in the consumers. Out of 240 mothers, only 34.2% tasted food by fingers. This finding was consistent with the study done on Saudi women which reported that most of the participants avoided tasting of foods by fingers or using the same spoon several times.[14]Although 63.3% knew that during illness one should not prepare meals, however only 29.6% practiced it. This indicates that mothers may have the correct knowledge but failed to do the correct practice probably due the unavailability of other alternatives.

Regarding purchasing behaviour of the participants, almost all of the participants (98.8%) had knowledge regarding checking of labels and expiry dates. Similar results were shown in studies done in Egypt and Saudi Arabia in which majority of the women reported reading expiry dates.[12,14] In most developing countries food is purchased from roadside vendors, thus having no expiry dates. Almost all mothers knew that ingredients should be checked while purchasing food products. However less than half (44.6%) of them actually checked for ingredients before buying food items perhaps because it requires time and effort which busy mothers with young children may not have or they do not realize the importance of it. On the contrary a study done in Sudan showed that only half the women were aware of food labels with written expiry dates.[11] Similar results were shown in Indian study in which out of 48% who buy food products, more than 78% cannot recognize the symbols on food labels due to lack of literacy.[7]

Homes are the point of first contact for all age groups, and may not be influenced by any rules and regulations for the preparation, handling and storage of food, therefore knowing the baseline knowledge and practices in vulnerable group is essential for the development of effective health educational programs.

The limitations of this study include limited sample size, and samples drawn only from family medicine clinics of one teaching hospital of Karachi, which reduces external validity. Thus, the findings cannot be considered representative of all mothers in Pakistan. Another limitation is that food safety practices were assessed through self-reporting which may overestimate the actual practices.

Conclusion

1. Inadequate knowledge about food safety was registered in 17.5% and incorrect practices in 24.2%, which is a significant number for this at risk population.
2. There appears to be a gap between the knowledge and practices of mothers. Although the overall knowledge was found to be adequate at 82.5% but the practices need to be improved to prevent the burden of food-borne illnesses.

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