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DOI: 10.46903/gjms/20.03.986

ORIGINAL ARTICLE

FOOD SAFETY KNOWLEDGE AND PRACTICES AMONG HOUSEHOLD WOMEN IN BAHAWALPUR CITY, PAKISTAN

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ABSTRACT

Background: Food safety is essential for preserving and promoting health of consumers. The objectives of this study were to determine the frequency of levels of food safety knowledge and practices and their association to age groups among household women in Bahawalpur City, Pakistan.

Materials & Methods: This cross-sectional study was conducted in Department of Community Medicine, Quaid-E-Azam Medical College, Bahawalpur, Pakistan from April-September 2021. 193 household women were selected from Satellite Town and Shahdrah from Bahawalpur City. Age groups, food safety knowledge and practices were analyzed by count and percentage with 95%CI. Chi-square test of association was used to testify two hypotheses.

Results: Out of 193 women, maximum 93 (48.18%) belonged to 30-39 years, followed by 77 (39.89%) 40-49 years, 19 (9.844%) 20-29 years and four (2.072%) 15-19 years. Level of food safety knowledge was fair in 94 (48.70%), followed by good in 57 (29.53%) and poor in 42 (21.76%). Level of food safety practices was good in 94 (48.70%), fair in 65 (33.67%) and poor in 34 (17.61%). There was association between levels of food safety knowledge and age groups (p=.00008) and levels of food safety practices and age groups (p=.000017).

Conclusion: Our population showed level of food safety knowledge as fair in maximum women, followed by good and poor. Level of food safety practices was good in maximum women, followed by fair and poor. There was association between level of food safety knowledge and age groups and level of food safety practices and age groups of women.

KEYWORDS: Food; Food Safety; Health; Knowledge; Public Health; Women; Age Groups; Pakistan.

Cite as: Abbas H, Syed F, Syed M, Hussain W. Food safety knowledge and practices among household women in Bahawalpur City. Gomal J Med Sci 2022 Jul-Sep; 20(3):154-8. https://doi.org/1046903/gjms/20.03.986

1. INTRODUCTION

1.1 Background: "From farm to plate, make food safe": World Health Day 2015 Slogan.[1]

Since beginning of mankind, foodborne diseases have been serious public health problem, causing significant economic consequences amounting to 2.9 billion dollars each year.[2-4] These illnesses have devastating effect on younger children, elderly and sick, causing 2.2 million deaths in developing world each year, including 1.9 million children.[5-7] Approximately 30-40% of foodborne disease cases occur in home settings as reported by World Health Organization (WHO).[2]

Persons handling food items have important role in transmission of food-borne diseases.[8] These persons can pose higher risks of food-borne diseases due to unhygienic food items handling practices.[9] A very crucial role is being played by home food preparers in preventing contamination of food during its preparation, handling and storage; which are mostly women. That is why food safety education is strongly recommended for women, as directed by WHO.[10-12]

Many studies have been conducted in different countries to evaluate the food safety knowledge and practice of food handlers' at household level showed that consumers were lacking adequate knowledge regarding food safety.[10,5] Reason behind 80% of unhygienic food handling practices came out to be deficient knowledge regarding food safety.[3]

Study carried out in Sudan showed that most participants (72.2%) knew importance of hand washing before preparation of food, and checking of expiry dates of food products (77.6%). Assessment of food

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Date Submitted: 09-10-2021
Date Revised: 02-06-2022
Date Accepted: 25-06-2022

safety practice revealed that thawing of frozen food was being done at room temperature by most women (77.6%) and only few of them (10%) used refrigerator for it.[10] Nationwide survey in USA reported that use of raw eggs was considered unsafe by majority of respondents (85%). 93% participants had good practice of separating cooked meat from raw meat.[3]

A study conducted by Meysenburg, et al.[12] found that regarding food safety knowledge, respondents recommended that the best way to determine properly cooked meat was clear running of juices (4%), brown colour of meat in middle (23%) and by testing with thermometer (37%).

1.2 Research problems (RPs), Knowledge gaps (KGs) and Research questions (RQs): We had four **RPs**; unawareness of frequency of different levels of food safety knowledge and food safety practices and their relationship to age groups among household women in Bahawalpur City, Pakistan. No relevant studies were available on different search engines/ databases. These were our four KGs. What is the frequency of different levels of food safety knowledge and practices and their relationship to age groups among household women in Bahawalpur City were our four RQs. To find answers for these RQs, to fill these KGs and to solve these RPs was justifications for our current investigation.

1.3 Research Objectives (ROs)

1. To determine the frequency of different levels of food safety knowledge among household women of Bahawalpur City, Pakistan.
2. To determine the frequency of different levels of food safety practices among household women of Bahawalpur City, Pakistan.
3. To determine the association between different levels of food safety knowledge and age groups among household women in Bahawalpur City, Pakistan.
4. To determine the association between different levels of food safety practices and age groups among household women in Bahawalpur City, Pakistan.

1.4 Research (Null) Hypotheses

H_{01}: There is no association between different levels of food safety knowledge and age groups among household women in Bahawalpur City, Pakistan.

H_{02}: There is no association between different levels of food safety practices and age groups among household women in Bahawalpur City, Pakistan.

1.5 Significance of study: This study will give us the magnitude of the problem and will help the coming researchers in this field.

2. MATERIALS AND METHODS

2.1 Design, duration and setting: This cross-sectional study was conducted in Department of Community Medicine, Quaid-E-Azam Medical College, Bahawalpur, Pakistan from April-September 2021. Institutional Ethical Committee granted the permission.

2.2 Population and sampling: Bahawalpur is a city in South Punjab, Pakistan. We selected two areas of the city conveniently; Satellite Town (upper socio-economic group) and Shahdrah (lower socio-economic group) with as estimated population of 20,000. A sample of 193 women was selected conveniently. All household women were eligible. Those not willing to participate were excluded.

2.3 Data Collection tool/ questionnaire: The data was collected through a questionnaire. This questionnaire was adapted from WHO Questionnaire with some items from other published resources. The variable 'food safety knowledge' had seven items, each with three responses of Disagree, Don't know and Agree, with 1, 2 and 3 score respectively. The variable 'food safety practice' had seven items, each with two responses of No and Yes, with 1 and 2 score respectively.

2.4 Conduct of procedure: The 2nd author herself visited the homes. The questionnaire was in English. It was translated in the respondents' native language Urdu or Punjabi by the author and their responses were marked for them by the author. This way the author was able to have 100% response rate.

2.5 Data collection plan: Age group was a demographic variable on ordinal scale with four attributes; 15-19, 20-29, 30-39 and 40-49 years. Food safety knowledge and food safety practices were two research variables on ordinal scale. Food safety knowledge had three attributes based on aggregate score on questionnaire; poor (7-13), fair (14-19) and good (20-21). Food safety practices had three attributes based on aggregate score on questionnaire; poor (7-9), fair (10-12) and good (13-14).

2.6 Data analysis plan

2.6.1 Descriptive statistics and estimation of parameter: Age groups, food safety knowledge and food safety practices were described by count and percentage with 95% CI with normal approximation method for population using online statistical calculator "Statistics Kingdom".[13]

2.6.2 Hypotheses testing: H_{01} and H_{02} were testified through chi-square test of association[14,15] at alpha 5%, using statistical calculator "Social Science Statistics".[16]

3. RESULTS

3.1 Descriptive statistics and estimation of parameter: Out of 193 women, four (2.07%) were from 15-19 years age group, 19 (9.84%) from 20-29 years, 93 (48.19%) from 30-39 years and 77 (39.90%) from 40-49 years.

3.1.1 Levels of food safety knowledge (RO 1): Level of food safety knowledge was fair in 94 (48.70%),

followed by good in 57 (29.53%) and poor in 42 (21.76%) women. (Table 3.1.1)

3.1.2 Levels of food safety practices (RO 2): Level of food safety practices was good in 94 (48.70%), fair in 65 (33.67%) and poor in 34 (17.61%) women. (Table 3.1.2)

3.2 Hypotheses testing

3.2.1 Association between levels of food safety knowledge and age groups (RO 3, H_{01}): Chi-square test of association showed association between the levels of food safety knowledge and age groups among household women at alpha .05, with p-value .00008. (Table 3.2.1)

3.2.2 Association between levels of food safety practices and age groups (RO 4, H_{02}): Chi-square test of association showed association between the levels of food safety practices and age groups among household women at alpha .05, with p-value <.00001. (Table 3.2.2)

Table 3.1.1: Levels of food safety knowledge among household women in Bahawalpur City (n=193)

Variable/ Attributes	Sample Statistics		95% CI of proportion	
Food Safety Knowledge	Count	Percentage	Upper	Lower
Poor Knowledge	42	21.76	15.94	27.58
Fair Knowledge	94	48.71	41.65	55.76
Good Knowledge	57	29.53	23.09	35.97
Total	193	100	Population parameters	

Table 3.1.2: Levels of food safety practices among household women in Bahawalpur City (n=193)

Variable/ Attributes	Sample Statistics		95% CI of proportion	
Food Safety Practices	Count	Percentage	Lower	Upper
Poor Practice	34	17.62	12.24	22.99
Fair Practice	65	33.68	27.01	40.35
Good Practice	94	48.70	41.65	55.76
Total	193	100	Population parameters	

Table 3.2.1: Association between levels of food safety knowledge and age groups among household women in Bahawalpur City, Pakistan (n=193)

Age groups (years)	Levels of food safety knowledge									Row Totals	$\Sigma\chi^2$	p-value
	Poor			Fair			Good					
	O	(E)	$[x^2]$	O	(E)	$[x^2]$	O	(E)	$[x^2]$			
15-19	2	(0.87)	[1.47]	1	(1.95)	[0.46]	1	(1.18)	[0.03]	4	28.37	.00008
20-29	3	(4.13)	[0.31]	13	(9.25)	[1.52]	3	(5.61)	[1.22]	19		
30-39	33	(20.24)	[8.05]	34	(45.30)	[2.82]	26	(27.47)	[0.08]	93		
40-49	4	(16.76)	[9.71]	46	(37.50)	[1.93]	27	(22.74)	[0.80]	77	d.f.=6, alpha .05	
Column Totals	42			94			57			193	H_{01} rejected	

O = Observed count, E = Expected count, x^2 = Chi-square value

Table 3.2.2: Association between different levels of food safety practices and age groups among household women in Bahawalpur City, Pakistan (n=193)

Age (years)	Levels of food safety practices									Rows Total	$\Sigma\chi^2$	p-value
	Poor			Fair			Good					
	O	(E)	$[x^2]$	O	(E)	$[x^2]$	O	(E)	$[x^2]$			
15-19	2	(0.70)	[2.38]	1	(1.35)	[0.09]	1	(1.95)	[0.46]	4	31.92	<.000017
20-29	2	(3.35)	[0.54]	10	(6.40)	[2.03]	7	(9.25)	[0.55]	19		
30-39	27	(16.38)	[6.88]	33	(31.32)	[0.09]	33	(45.30)	[3.34]	93		
40-49	3	(13.56)	[8.23]	21	(25.93)	[0.94]	53	(37.50)	[6.40]	77	d.f. =6, alpha .05	
Columns total	34			65			94			193	H_{02} rejected	

O = Observed count, E = Expected count, x^2 = Chi-square value

4. DISCUSSION

4.1 Levels of food safety knowledge (RO 1): Our study revealed that the level of food safety knowledge among household women in Bahawalpur City, Pakistan was fair in 94 (48.70%, 95%CI 41.65-55.76), followed by good in 57 (29.53%, 95%CI 23.09-35.97) and poor in 42 (21.76%, 95%CI 15.94-27.58). (Table 3.1.1)

Mendagudali, et al.[8] from April-June 2015 from India reported that 58.3% of respondents had good knowledge of food handling. Meysenburg, et al.[12] reported in November 2013 from USA that 44% participants had good knowledge and 8% of them had poor knowledge. Talat, et al.[17] reported from Bahawalpur, Pakistan in February 2018, that 36% of respondents had good knowledge, while 64% of them were having poor knowledge. Household women usually lack training and professional assistance regarding hygienic handling of food and so they are less aware about food safety measures.

4.2 Levels of food safety practices (RO 2): Our study revealed that the level of food safety practices among household women in Bahawalpur City, Pakistan was good in 94 (48.70%, 95%CI 41.65-55.76), fair in 65 (33.67%, 95%CI 27.01-40.34) and poor in 34 (17.61%, 95%CI 12.24-22.99) women. (Table 3.1.2)

The findings are in contrast to study done by Naeem, et al.[18] in Lahore, Pakistan published in June 2018; which showed that 99.7% of household women were having poor food safety practices.

4.3 Association between levels of food safety knowledge and age groups (RO 3, H_{01}): Our study showed association between the levels of food safety knowledge and age groups among household women in Bahawalpur City, Pakistan (p-value=.00008). (Table 3.2.1)

Similar to our study, significant relationship between food safety knowledge and age (p=.000) was revealed in a report by Salim,[10] published in January 2014 from Khartoum city, Sudan. Similar report is from Langiano, et al.[2] from Cassino, Italy; published in 2011, which showed significant association between food safety knowledge and age (p=.000) of household women. Also significant relationship between food safety knowledge and age (p=.000) was reported by Farahat, et al.[5] in household women, published in 2014 from Kingdom of Saudi Arabia. The findings concur with our results from a study conducted in Karachi, Pakistan by Harani, et al.[19] from January-July 2015 showing significant relationship of food safety knowledge with age (p=.435). Association of different factors like age, literacy and social and cultural norms may vary food handling practices in different communities and areas.

4.4 Association between levels of food safety practices and age groups (RO 4, H_{02}): Our study showed association between the levels of food safety practices and age groups among household women in Bahawalpur City, Pakistan (p-value=.000017). (Table 3.2.2)

Similar to our study, significant relationship between food safety practices and age (p=.000) was reported by Farahat, et al.[5] published in 2014 from Kingdom of Saudi Arabia. Also, this was similar to findings in a study conducted in Islamabad, Pakistan by Pervez, et al.[20] from January-February 2017 where significant relationship between food safety practices with age (p=.027) was found. Contrasting results were reported by Gkana, et al.[21] in a research in Greece published in 2017 in which there was no relationship between food safety practices and age (p>.05).

4.5 Marwat Logical Trajectory of Research Process: We have adopted this 8-steps process in our project.[22-24]

CONCLUSION

Our population showed level of food safety knowledge as fair in maximum women, followed by good and poor. Level of food safety practices was good in maximum women, followed by fair and poor. There was association between levels of food safety knowledge and age groups and levels of food safety practices and age groups of women in our population.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
GRANT SUPPORT AND FINANCIAL DISCLOSURE
None declared.

AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design:	HA, FS
Acquisition, Analysis or Interpretation of Data:	HA, FS, MS, WH
Manuscript Writing & Approval:	HA, FS, MS, WH

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.