Food Safety Attitude and Associated Factors Among Mothers of Under 5 Children, Debarq Town: Community-Based Cross-Sectional Study, 2019

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ABSTRACT

BACKGROUND: Food-borne diseases represent a widespread and growing public health problem, both in developed and developing countries. However, this problem has more impact on health and economy in developing countries than in developed countries but reliable data is not available.

METHODS: A cross-sectional study was done in 2019 at Debarq town, Amhara region, Northwest Ethiopia. A questionnaire prepared in English after adapted from previous studies then translated in to local language Amharic was used in order to collect the data. Data were checked manually for completeness, coded, and entered in to Epi Info version 7.1 and then exported in to SPSS version 26 statistical package for analyze. Descriptive statistics, percentage, frequency, standard deviation, and mean were analyzed. Likewise, bivariable and multivariable binary logistic regression analysis were done to know the relationship between the independent variables and attitude of food safety among mothers. The variables found having a *P*-value <.2 in the bivariable analysis were further analyzed in multivariable binary logistic regression. The variables with *P*-value <.05 were considered as significantly associated with food safety attitude of mothers.

RESULTS: About 423 mothers of under-5 children were involved in this study. The mean age of the participants was 39.844 ± 11.02. In this study, educational status (primary education (Adjusted Odds Ratio [AOR]: 2.66; 95% Confidence Interval [CI] [1.42-4.97]), secondary education (AOR: 2.66; 95% CI [3.35-14.05]), and diploma and above (AOR: 4.07; 95% CI [1.65-10.06])), higher income (AOR: 3.58; 95% CI [1.54-8.29]), good food safety knowledge (AOR: 3.08; 95% CI [1.51-6.242]) and good food hygiene practice (AOR: 3.97; 95% CI [2.33-6.75]) were factors associated with food safety attitude in the current study.

CONCLUSION: Significant proportion of participants in the study area had poor food safety attitude. Educational status, income, food safety knowledge, and food safety practice were significantly associated with food safety attitude among mothers. Food hygiene practice, knowledge, and level of education should be increased in order to improve food safety attitudes among mothers who were responsible in food processing at household level.

KEYWORDS: Food borne illness, food safety attitude, food handlers, household level

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Background

Food safety is defined as food that is free from all risk, whether long term or acute that may make food deleterious to health of the consumer.[1] Food-borne diseases represent a widespread and growing public health problem, both in developed and developing countries. However, this problem has more impact on health and economy in developing countries than in developed countries but reliable data is not available.[2]

World Health Organization (WHO) recognized foodborne illnesses and occurrences as a foremost public health threat globally of the 21st century.[3] Although experts generally agree that homes are one of the primary locations where most foodborne illness cases occur,[4-6] many consumers do not consider the home to be a risky place with regard to foodborne illness. There are many reasons why home is the location associated with significant foodborne illness risk. First, the greatest proportion of the food we eat is prepared at home, thereby increasing the opportunities for food handling errors to occur. The emphasis frequently placed on how often people "eat out" causes many to not realize that the home food environment provides 72% of the food, by weight, consumed by Americans and accounts for 93% of the food consumed by those who eat most meals at home.[7]

Household kitchens are often used as a many purposes where the risk of food contamination and spread of foodborne disease is high.[8,9] Many food borne disease and their related on economic costs may be the consequence of preventable food handling mistakes in the kitchen.[10] Everyone at each food processing chain should have their own role. Because it is impossible for food producers only to secure a pathogen-free food

supply, due to this at home food preparer is a critical link in the chain to prevent food-borne illness.[11]

Mothers have many more activities at household including their children care, show them the correct way of food hygiene practices and performing many activities a time.[12] As well, mothers are primarily food handlers at home and their knowledge, attitudes, and practices (KAP) in prevention of diarrhea influence child health and wellbeing. Good attitudes can give more impact to food handlers practices in food safety.[13] Therefore, more than knowledge mothers' attitude toward food safety in the kitchen and environmental conditions on how food becomes contaminated at home is essential in order to reduce food hazards related with food contamination.[14] There is no published article regarding food safety attitude among mothers at the study area. Hence, the main interest of this research was to understand mothers' attitude and factors associated in food safety at household level.

Methods

Study design, period, and area

A descriptive cross-sectional study method was done in 2019 at Debarq town, Amhara region, Northwest Ethiopia. Debarq town located at 830 km far from Addis Ababa, the capital city of Ethiopia. The district has latitude of about 13.133°N and longitude of about 37.900°E and an elevation ranging from 2712 to 3122 m above sea level. A total of 423 mothers were participated in this study.

Data collection instrument

A questionnaire prepared in English after adapted from previous studies[15,16] then translated in to local language Amharic. First, demographic information of each participant, such as age, educational level, income level, number of family, and food safety related training were asked. The questionnaire then lookup informations about the mothers' attitude, practice, and knowledge of food safety in home kitchens through face to face interview. There were 31 question to assess knowledge (10 items as yes/no), attitude (9 items with 5-levels Likert scale), and practice (12 items). In the attitude section, the questionnaire provided 9 Likert scale item questions ranging from "strongly agree" to "strongly disagree" and food safety knowledge also asked using Likert scale from rarely to always. The questionnaire was tested with a pilot sample (N = 21). Details about the data collection tool is presented elsewhere.[17] The validity of the questionnaire, which is measured in the type of content validity, was acquired by the experts and its reliability was established using internal stability method (Cronbach's alpha coefficient). Then Cronbach's alpha value was .744.

Data collection procedure

Three fourth year Environmental and occupational health and safety students, who were well-trained on the content of the data collection tool, on method of collecting data and ethical issues accomplished the data collection. The study Participants were enrolled by using simple random sampling technique. Then, those respondents were interviewed after explained statements in the questionnaire.

Data analysis

Data were checked manually for completeness, edited, coded, and entered in to EpiInfo version 7.1 and then exported in to Statistical Package for the Social Sciences (SPSS) version 26 statistical package for analyze. For each question the participants were given 1 point the correct answered and a 0 when the answers were incorrect answers. Descriptive statistics, percentage, frequency, standard deviation, and mean were analyzed. Likewise, bivariable and multivariable logistic regression was analyzed to know the relationship between the sociodemographic variables and attitude of food safety in homes kitchen. The variables found having a P-value $<.2$ in the bivariable analysis were further analyzed by multivariable logistic regression. The variables at adjusted odds ratio (AOR) with 95% confidence interval (CI) and $P<.05$ were considered as statistically significant association with food safety attitude of mothers.

Operation definitions. When the score of food safety practice is lower than to the mean value were "poor food safety practice" and when it is equal or higher than the mean value, it was categorized as good in food safety practice.

The value lower than to mean were "poor food safety knowledge" and equal or higher than the mean value were "good food safety knowledge."

Scores less than the mean score were "poor attitude" and equal to or higher score referred "good attitude."

Results

The results of demographic variables revealed that the mean age was 39.844 ± 11.02 (SD) years old and 57.2% of the women were married. Only a few of the participants had the highest educational level (16.8%) and the largest proportion (40.7%) of participants not read and write. Ninety-one (21.5%) of the respondents had training related food safety. Level of income of the participants was the same in proportion (Table 1).

Food safety knowledge, attitude, and practice levels of mothers

Of the 423 participants, 321 (75.9%) had a good level of knowledge, and 210 (49.6%) mothers had a good level of food safety practice. Mean attitude score among participants was 28.78 (±SD = 4.99). The overall positive attitude toward food safety in the current study was 50.4% at 95% CI (45.9%-55.3%) and 210 (49.6%) negative attitude (Table 2).

Table 1. Socio-demographic information of study participants (n = 423).

VARIABLES	CATEGORY	FREQUENCY	PERCENTAGE
Age	<30	103	24.3
	30-40	129	30.5
	40.5-48	89	21.0
	>48	102	24.1
Mean age = 39.8440 ± 11.02 (SD)			
Marital status	Married	242	57.2
	Unmarried	181	42.8
Level of education	Not read and write	172	40.7
	Primary education	96	22.7
	Secondary education	84	19.9
	Diploma and above	71	16.8
Level of income	<800	111	26.2
	800-1100	103	24.3
	1101-2145	104	24.6
	>2145	105	24.8
Food safety training in the past 2y	Yes	91	21.5
	No	332	78.5
Religion	Christian	333	78.7
	Muslim	90	21.3

Table 2. Food safety knowledge, attitude, and practice magnitude of study participants.

VARIABLES	CATEGORIES	FREQUENCY	PERCENTAGE
Knowledge	Good	321	75.9
	Poor	102	24.1
Attitude	Positive	213	50.4
	Negative	210	49.6
Practice	Good	210	49.6
	Poor	213	50.4

Factors associated with mothers' food safety attitude

In bivariable binary logistic regression analysis, age, educational level, income, marital status, knowledge, food hygiene practice, attending food safety training in the past 2 years and ever attended food safety training were associated with mothers' food safety attitude. From these variables, food safety knowledge, food safety practice, level of education, and income were significantly associated food safety attitude among mothers. In this study, participants who had primary education 2.66 times (AOR: 2.66; 95% CI [1.42-4.97]), those with secondary education 6.86 times (AOR: 2.66; 95% CI [3.35-14.05]) and those who had diploma and above educational status were 4.07 times (AOR: 4.07; 95% CI [1.65-10.06]) more likely to hold positive food safety attitude than those who were unable to read and write. Study participants whose income was more than or equal to 2145 birr were 3.58 (AOR: 3.58; 95% CI [1.54-8.29]) times more likely to have positive attitude toward food safety compared with those study participants whose income was less 800 ETB. Mothers with good food safety knowledge had 3.08 times higher positive food safety attitudes as compared with their counterparts poor food safety knowledge (AOR: 3.08; 95% CI [1.51-6.242]). As well as those study subjects who had good food hygiene practice were 3.65 times higher than in food safety attitude as compared with those who had poor food hygiene practice (AOR: 3.97; 95% CI [2.33-6.75]) (Table 3).

Discussion

This study was designed to assess food safety attitude and covariates among mothers who were responsible for food processing at Debarq town. The overall positive attitude toward food safety

Table 3. Factors associated among mothers food safety attitude at Debarq town, Northwest Ethiopia, 2019.

VARIABLES	FOOD SAFETY ATTITUDE		COR (95% CI)	AOR (95% CI)
	POSITIVE	NEGATIVE		
Age in year				
<30	62	41	1	1
30-40	73	56	0.86 (0.51, 1.46)	1.16 (0.60, 2.26)
40.5-48	42	47	0.59 (0.33, 1.05)	1.26 (0.61, 2.616)
>48	36	66	0.36 (0.21, 0.64)	1.21 (0.56, 2.62)
Educational level				
Not read and write	44	128	1	1
Primary	46	50	2.168 (1.87, 5.36)	2.66 (1.42, 4.97)*
Secondary	62	22	8.20 (4.52, 14.86)	6.86 (3.35, 14.05)**
Diploma and above	57	14	11.84 (6.02, 23.32)	4.07 (1.65, 10.06)*
Income				
<800	46	65	1	1
800-1100	44	59	1.05 (0.61, 1.81)	0.97 (0.51, 1.85)
1101-2145	51	53	1.36 (0.79, 2.33)	0.96 (0.49, 1.88)
>2145	72	33	3.08 (1.76, 5.39)	3.58 (1.54, 8.29)*
Marital status				
Married	121	121	1	1
Unmarried	92	89	1.03 (0.70, 1.52)	1.06 (0.65, 1.75)
Knowledge				
Poor	27	75	1	1
Good	186	135	3.83 (2.34, 6.26)	3.08 (1.51, 6.242)*
Food hygiene practice				
Poor	151	62	1	1
Good	59	151	6.23 (4.09, 9.50)	3.97 (2.33, 6.75)**
Ever attended food safety hygiene training				
No	153	179	1	1
Yes	60	31	2.26 (1.40, 3.68)	1.67 (0.97, 2.88)

1 = reference group, reliability statistics, 1 ETB (Ethiopian Birr) = 0.03 USD, Hosmer and Lemeshow test = 0.589.
*Significant at $P < .05$. **Significant at $P < .001$.

in the current study was 50.4% at 95% CI (45.9%-55.3%). There is a continuing need to increase the collection and reporting of data on linear child development.[18] Poor food safety attitude might act as factors causative to the high problem of child undernourishment include the high prevalence of transmissible diseases such as diarrheal diseases, poor infant, and young child feeding practices, as well as poor water, sanitation, and hygiene.

The poor attitude toward food safety may result in health catastrophes including to malnutrition and multiple gastrointestinal diseases.[19] Food safety plays a vital role in the prevention of stunting which is exacerbated during COVID-19 pandemic because it affects affordability and access to safe food in general.[18] The COVID-19 may also result in poor food safety due to lack of access to food as well as discrimination due to fear of the pandemic as evidenced from a study.[20] Hygienic practices including hand washing, proper sanitation, and other basic behavioral changes are among the proven method of reducing childhood malnutrition.[21] However, during COVID-19, lockdowns

and movement restrictions may further complicate access clean water and safe sanitation services which could contribute to a child's poor health, leading to a higher rate of morbidity and mortality.[21] During pandemics such as COVID-19, one of the interventions is providing basket food to poor people, which is essential to maintain food security and this requires at most care to prevent food spoilage due to poor food handling practices.[22]

Educational status, income, and food safety knowledge and food safety practice were significantly associated with food safety attitude among mothers of under-5 children in the current study.

The proportion of mothers with positive food safety attitude in this study was lower than reports from studies conducted among women in Ghana Accra,[23] Egypt,[24] Khaza bazar, India,[25] and Ankara, Turkey[26] whereas this result was in line with a study conducted in Nigeria.[27] However it was higher than the studies done among food handlers in Gondar, Ethiopian,[28] and women in Lahore.[29] The possible explanation for their difference might be due to the study population difference, data collection instrument, time, and study setting. Different studies had shown that, there are multiple covariates that affect food safety knowledge, attitude, behaviors, perception, and practice. From these, sociodemographic variables were the most importantly significant factors.[30-32] But in this study, only income and educational level were statistically significant socio-demographic factors affecting food safety attitude among study participants.

In this study, participants at higher income were more likely to have positive attitude in food safety as compared with those of study participants less income counterparts. This result was supported with the study that reveled attitude was improved as income level increased.[33] However, another study showed that individuals with a higher income are less worried about food safety attitudes than those with a lower income.[34]

In addition, participants with good food hygiene practice had good food safety attitude likely in experiencing good attitude in food safety practice. This funding was supported by other study done in Palestine.[33]

Mothers with good level of knowledge had more positive attitude as compared with those who had poor level of knowledge toward food safety. This funding revealed that good knowledge level in food safety among study subjects is mandatory for having good attitude, even alone does not enough to develop proper behaviors in food safety. A possible explanation for good level of knowledge among participants might enable and will influence participants food safety attitude.[35,36] This result was in line with other similar study done in Tehran, Iran, Malaysia, and Palestine.[33,37,38]

Educational status was another statistically significant factor with food safety attitude among study subjects. Mothers with higher education had higher probability having positive attitude toward food safety. It could be due to that higher education might help to shape or change in behavior of mothers in good attitude toward food safety. Other studies[26,29,37] also revealed that educated mothers had more positive attitudes in relation to food safety and those with respondents that have low educational level had less good attitude level compared to the respondents that have high education level.

In this study food safety related training was not significantly associated with food handlers' food safety attitude. However, other earlier studies[39,40] revealed that food safety training and food safety attitude were significantly correlated. However, this finding contradicted with the other study done in Brazil.[41] The possible explanation for this difference is, the training given for participants might be superficial and inconsistent type training.

Limitation

There are some limitation of this study. Respondents' bias was not address. Since the exposure and outcome are assessed at the same time, there may not be evidence of a temporal relationship between exposure and outcome.

Conclusion

This study was designed to assess the food safety attitude of mothers at Debarq town. Study participants in the study area were poor in attitude food safety. Educational status, level of income, food safety related knowledge and food safety practice were significantly associated factors in food safety attitude among mothers. Food hygiene practice and knowledge should be increased in order to improve food safety attitudes among mothers who were responsible in food handling practice.

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Author Contributions

All authors contributed to conceptualization, methodology, analysis, data curation, validation, and conception, writing, and approving the final manuscript.

Ethical Consideration

Ethical clearance was obtained from the ethical committee of the Department of Environmental and Occupational Health and Safety of the University of Gondar and an official letter was submitted to the town and kebeles administrators.

Consent

This manuscript does not contain an individual participant data.

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Data Availability

Data will be available upon request to the primary and corresponding authors.

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