

Food Safety Awareness and Practices among Adult Women and Its Association with Acute Diarrheal Disease in their Household in a Rural Area of Coimbatore, Tamil Nadu

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ABSTRACT

Background: Food safety is a paramount concern in today's world, given its critical implications for public health. Contaminated food can lead to severe illnesses and outbreaks, affecting individuals of all ages and backgrounds. Therefore, the study was conducted to assess the level of food safety awareness and attitude among adult women.

Subjects and Method: A cross-sectional study was conducted in the rural field practice area of PSG Institute of Medical Sciences & Research, Coimbatore from December 2019 to May 2020. A total of 400 participants were selected using systematic random sampling. A pretested, validated study questionnaire was used to collect the data. Data analysis is done by the estimation of disease risk associated with exposure and calculating the $p < 0.050$ proving the statistical association between exposure status and disease occurrence.

Results: Half of them (50%) had adequate knowledge regarding food safety practices and 60% adequately practiced them. Washing hands after using the toilet was practiced by 80.8%. Washing hands before eating food was practiced by 74.3%. Rat and fly menace were present in 20.5% and 23.3% respectively. Acute Diarrheal Disease was present in 19.3% of households. The presence of acute diarrhoeal disease (ADD) was found to be significantly higher in those who were not washing their hands after using the toilet, presence of flies and rats in the kitchen, and having inadequate knowledge and practices regarding food safety.

Conclusion: Though half of the women demonstrated awareness of food safety principles, the study revealed that actual implementation of safe practices remains inadequate. The association of diarrheal diseases with poor handwashing habits, as well as the presence of pests in the kitchen, emphasizes the critical need for targeted interventions to address these issues.

Keywords: Food safety, knowledge, practice, women, handwashing

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BACKGROUND

Food safety is a paramount concern in today's world, given its critical implications

for public health. Contaminated food can lead to severe illnesses and outbreaks, affecting individuals of all ages and backgrounds

(Akabanda et al., 2017). However, certain demographic groups, such as pregnant women, the elderly, and those with compromised immune systems, are particularly susceptible to foodborne diseases, necessitating special attention to their food safety practices. Among these vulnerable populations, adult women play an essential role in food preparation, consumption, and decision-making within households. Understanding their level of food safety awareness and practices is crucial to safeguarding the well-being of their families and communities (Al Mamun et al., 2013).

Food safety entails a comprehensive set of practices and precautions designed to ensure that food products are free from contaminants, pathogens, and harmful substances, making them safe for consumption. These practices encompass various aspects, including proper food handling, storage, cooking, and serving. Failure to adhere to these practices can lead to the proliferation of foodborne pathogens, such as *Salmonella*, *E. coli*, and *Listeria*, resulting in severe gastroenteritis, vomiting, diarrhea, and, in extreme cases, even death (Chellaiyan et al., 2018). The Center for Disease Control and Prevention (CDC) estimates that foodborne illnesses affect approximately 48 million Americans annually, leading to thousands of hospitalizations and fatalities (CDC, 2021; Akabanda et al., 2017).

Given the potential severity of foodborne illnesses and their substantial economic and social impact, addressing food safety concerns is of utmost importance. One effective approach is to focus on vulnerable groups with elevated risk, such as pregnant women. The health of pregnant women directly influences fetal development, emphasizing the significance of their food safety practices. The elderly and those with weakened immune systems also warrant special attention, as their ability to combat

foodborne pathogens may be compromised. Consequently, understanding the food safety practices of these vulnerable groups is vital for designing targeted interventions to mitigate the risks associated with foodborne illnesses (FAO, 2016).

Of particular interest in this study is the role of adult women in food safety practices. Adult women often shoulder the responsibility of meal preparation and decision-making within households, significantly influencing the health and well-being of their families. Their actions can have far-reaching consequences, affecting not only their immediate family members but also the broader community. As such, it becomes imperative to explore their level of food safety awareness and the practices they employ during food preparation, cooking, storage, and handling. Although existing literature has addressed food safety awareness and practices among various demographic groups, there is a notable dearth of research specifically focusing on adult women. By understanding the factors influencing their food safety behaviors, such as educational background, socioeconomic status, cultural practices, and previous experiences with foodborne illnesses, it can devise targeted strategies to enhance their food safety knowledge and promote safer food handling practices (FAO, 2016).

By obtaining a comprehensive understanding of the factors that influence food safety practices among adult women, this study endeavors to provide valuable insights to public health policymakers and relevant stakeholders (Green and Knechtges, 2015). The results can serve as a basis for the development of tailored interventions and educational campaigns aimed at improving food safety practices within households and communities. By empowering adult women with the knowledge and resources to handle food safely, it can collectively work towards re-

ducing the burden of foodborne illnesses and promoting better health outcomes for all. Moreover, the prevalence of acute diarrheal disease in children under 5 years according to NFHS-5 is 7.3%. Ultimately, this research seeks to contribute to a safer and healthier society, where foodborne illnesses are minimized, and individuals can confidently enjoy their meals without fear of contamination (Hassan and Dimassi, 201).

Therefore, the study was conducted with the objectives of assessing the level of food safety awareness and attitude among adult women in different demographic groups and examining food safety practices followed by them. The study would also identify the association between food safety awareness with the occurrence of acute diarrhoeal diseases (ADD).

SUBJECTS AND METHOD

1. Study Design

A cross-sectional study was conducted in the field practice area of the Rural Health Training Centre (RHTC), Vedapatti, under the Department of Community Medicine, PSG Institute of Medical Sciences and Research, Coimbatore from December 2019 to May 2020.

2. Population and Sample

The Study participants were adult women aged 18 years and above in the field practice area. Houses in the village were enumerated and participants were enrolled by systematic random sampling method. The eldest female member available at the house at the time of data collection was included. Inclusion criteria were residents of ≥ 18 to 60 years of age and residents of the village for more than 6 months. Those who cannot be contacted even after three visits were excluded.

The prevalence of food awareness in a study conducted by (Chellaiyan et al., 2018), was found to be 50.5%. An absolute error of 5% is taken, and the sample size came to be

384. We have collected data from 400 study participants in our study.

3. Study Variables

The independent variables of interest include poor handwashing habits, the presence of pests in the kitchen, and knowledge and practice of food safety measures which impacts the dependent variable being the development of acute diarrheal disease.

4. Operational Definition of Variables

Acute diarrheal disease: was defined as a person who has had more than 2 episodes of Diarrhea within the last 4 weeks

Poor handwashing habits: Not washing hands after using the toilet, before cooking, and before eating

The presence of pests in the kitchen: The presence of any rodents or flies in the kitchen in the past 4 weeks.

Knowledge and practice of food safety measures: Each knowledge question was given a score of '1' if the option mentioned was correct and '0' if it was wrong. Similarly for each good practice a score of '1' was given and a score of '0' was given for bad practice. So those who had scored more than half of the total score were considered to have adequate knowledge and practice respectively.

5. Study Instruments

A pretested, validated study questionnaire was used to collect the data. The study instrument comprises four sections. Section 1 comprises Socio-demographic details such as age, sex, education, occupation, marital status, and socioeconomic status (modified BG Prasad classification). Section 2 comprises knowledge of food handling practices. Section 3 includes attitudes towards food practices like washing vegetables, eating raw vegetables, and intake of carbonated/ beverages and energy drinks. The section includes questionnaires regarding food hygiene practices at home like food habits, source of drinking water and milk, method of cooking egg and milk products, hand-

washing practices, methods used to clean vegetables/fruits, storage of cooked food items, frequency of gastroenteritis infections among family member in last one year.

6. Data Analysis

Data was entered and analyzed using Statistical Packages for Social Sciences (SPSS) version 24. The descriptive data were expressed as percentages. Association between independent variables and knowledge, attitudes, and practices were tested for significance using the chi-square test and odds ratio with a 95% Confidence interval (CI) was estimated. A $p > 0.050$ was considered statistically significant.

7. Research Ethics

The study was approved by the Institutional Human Ethical Committee (IEC) with IHEC number 19/286 before data collection. Informed written consent was obtained from the study participants before administering the questionnaire. Health educational activities were organized regarding the food safety practices in the study area.

mean (SD) age of the study participants was found (Mean= 37.23; SD= 10.61). About 340 (85%) received some kind of formal education, and 60 (15%) were uneducated. Knowledge regarding food safety practices among the study participants is given in Figure 1. Almost all (98%) knew boiling milk before drinking, while knowledge about the temperature of the refrigerator was present only in 23.5% (Figure 1).

Food safety practices reported by the study participants are illustrated in Figure 2. Buying fresh foods and washing hands before eating food were practiced by 97.8% and 74.3% of study participants respectively. Washing hands after using the toilet was practiced by 80.8%. The practice of storing perishable foods in the refrigerator was found to be low at 45.8%.

Rat and fly menace were present in 20.5% and 23.3% respectively. About 89% reported using separate kitchens for cooking food substances. The practice of washing vegetables, fruits, and non-vegetarian foods was found to be adequate, but the practice of boiling water adequately was reported by only 47.3% (Figure 3).

RESULTS

The data was collected from 400 study participants with a 100% response rate. The

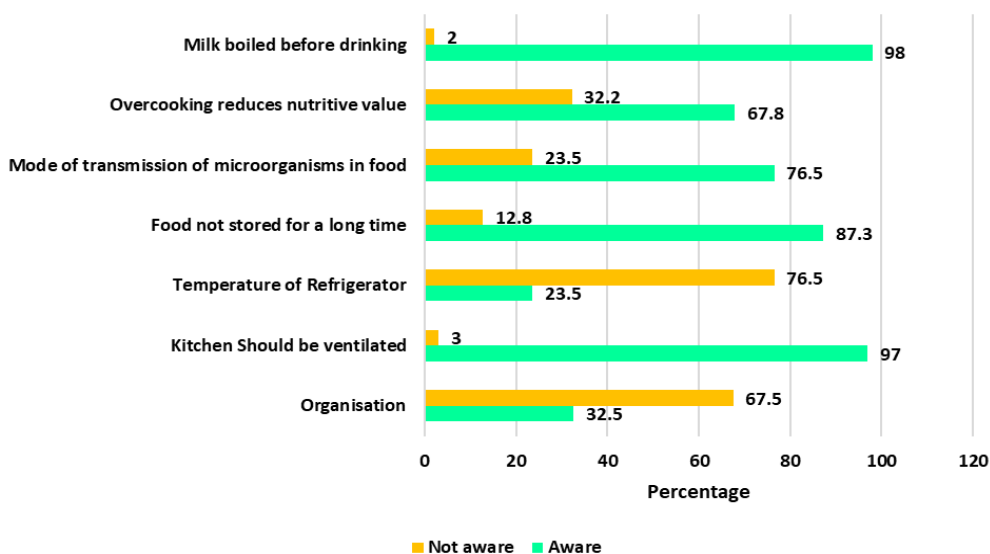


Figure 1. Knowledge about food safety practices among the study participants

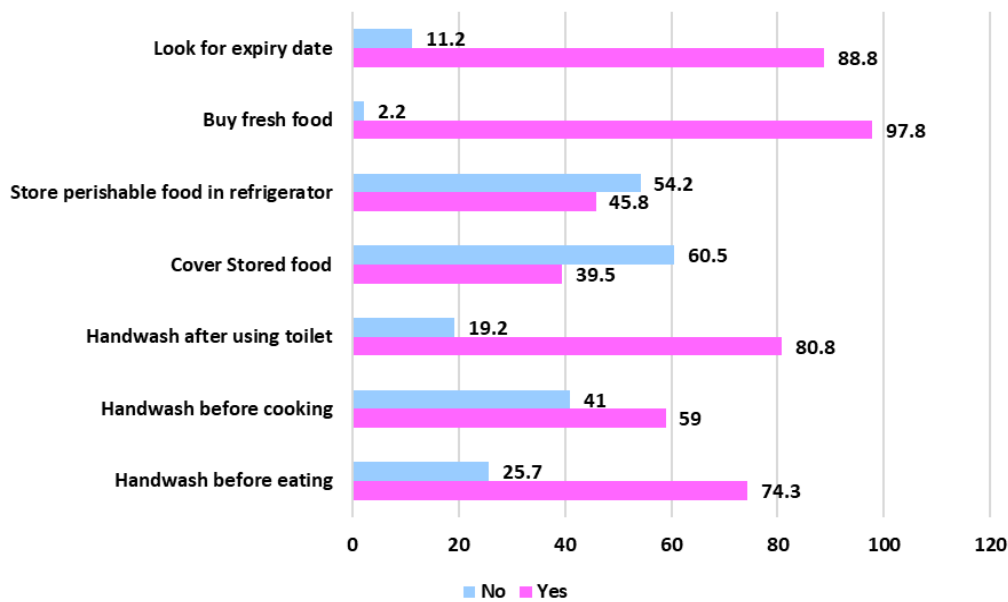


Figure 2. Food safety practices followed by study participants

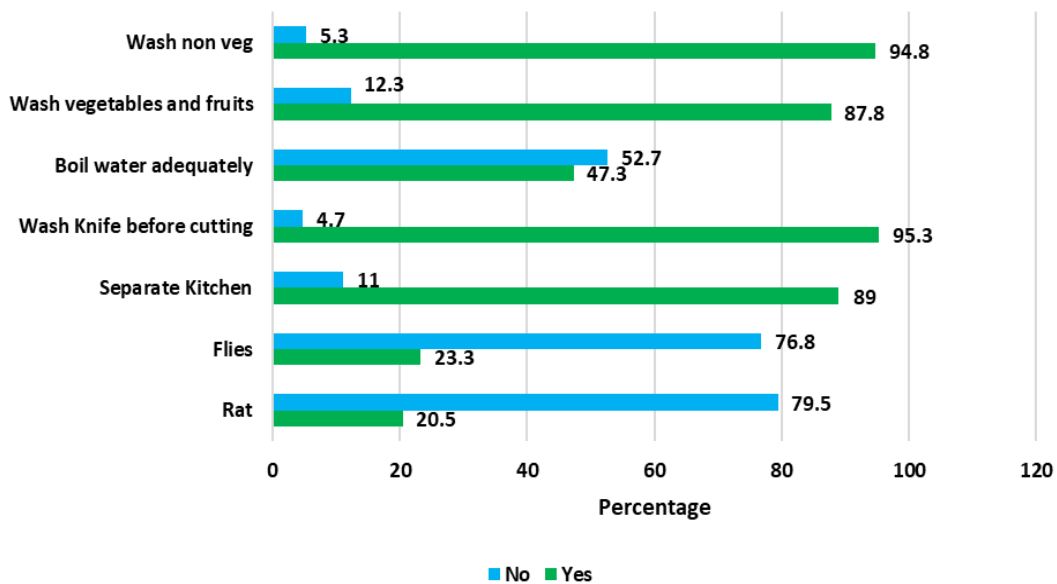


Figure 3. Food safety practices reported by the study participants

Table 1. Association between food safety awareness and practices with the presence of acute diarrhoeal diseases (ADD) in the study participants (n=400)

Variable	Responses	ADD present (n=77)		ADD absent (n=323)		OR	95% CI		p
		n	%	n	%		Upper Limit	Lower Limit	
		Hand washing after using toilet	No	22	28.6		55	71.4	
	Yes	55	17	268	83.0				
Flies in Kitchen	Present	28	30.1	65	69.9	2.26	3.88	1.32	0.002*
	Absent	49	16.0	253	84.0				

Variable	Responses	ADD present (n=77)		ADD absent (n=323)		OR	95% CI		p
		n	%	n	%		Upper Limit	Lower Limit	
Rat in Kitchen	Present	25	30.5	57	69.5	2.24	3.91	1.28	0.004*
	Absent	52	16.4	266	83.6				
Knowledge	Inadequate	47	23.5	153	76.5	1.74	2.89	1.04	0.031*
	Adequate	30	15.0	170	85.0				
Practice	Inadequate	40	25.0	120	75.0	1.82	3.01	1.10	0.017*
	Adequate	37	15.4	203	84.6				

*Significant p-value

Acute Diarrheal Disease was present in 19.3% of households. The presence of acute diarrhoeal disease (ADD) was found to be significantly higher in those who were not washing their hands after using the toilet, presence of flies and rats in the kitchen, and having inadequate knowledge and practices regarding food safety. The data are illustrated in Table 1.

DISCUSSION

The present study aimed to assess food safety awareness and practices among women, with a particular focus on their knowledge of food safety principles and the application of safe practices during food handling. The research findings shed light on important aspects of food safety among women, highlighting both areas of strength and areas that require attention and improvement.

This study found that 50% of the women surveyed demonstrated a prevalence of food safety awareness. This indicates that a significant proportion of women possess a basic understanding of food safety principles, including the importance of proper food handling, storage, and cooking. The findings are similar to the results of a study done in Kanchipuram (IFSQN,2022). While this is encouraging, it also suggests that a considerable number of women may still lack adequate awareness of food safety practices. Therefore, targeted educational programs and interventions can play a pivotal

role in increasing food safety awareness among women, further reducing the risks of foodborne illnesses (Kim et al., 2023)

However, despite the relatively high prevalence of food safety awareness, our study revealed that only 33% of women reported practicing food safety consistently. This discrepancy between awareness and practice is concerning, as it indicates a gap between knowledge and behavior. The reasons for this gap may be multifaceted, and they underscore the need for more in-depth investigations into the factors influencing food safety practices among women (Ncube et al., 2019)

One significant finding from this study was the association of diarrheal diseases with not washing hands after using the toilet. Women who reported not washing their hands after using the restroom exhibited a higher likelihood of experiencing diarrheal illnesses. This highlights the critical role of hand hygiene in preventing the transmission of pathogens and emphasizes the importance of promoting proper handwashing practices among women. Handwashing remains one of the most effective and accessible means of preventing the spread of foodborne diseases and should be emphasized in food safety educational initiatives (Ncube et al., 2019).

Moreover, the presence of rats and flies in the kitchen was identified as another key factor contributing to food safety risks.

Infestations of rodents and insects can contaminate food surfaces and ingredients, leading to foodborne illnesses. Proper sanitation practices and pest control measures are essential to reduce the likelihood of such infestations. Women should be educated on effective ways to prevent and eliminate pests in the kitchen, thereby minimizing potential hazards to food safety (Shamloo et al., 2021).

This study also uncovered inadequate knowledge and practices regarding food safety among a substantial proportion of women. This finding suggests that there is a need for comprehensive educational programs tailored specifically to women, addressing common misconceptions, and promoting correct food safety practices. These programs should cover a wide range of topics, such as safe food storage, appropriate cooking temperatures, and cross-contamination prevention.

One possible explanation for the gaps in food safety knowledge and practices among women could be a lack of access to reliable information and resources. Information dissemination through various channel, including social media, community workshops, and healthcare facilities, can play a crucial role in improving food safety awareness and practices. Additionally, community leaders and healthcare providers can be instrumental in advocating for food safety and providing practical guidance to women (Tuglo et al., 2021). Cultural practices and socioeconomic factors may also influence food safety behaviors among women. Understanding these cultural influences and addressing barriers specific to each community or region is essential in developing effective interventions. Tailoring educational materials to be culturally sensitive and linguistically appropriate can enhance their relevance and impact (Zeeshan et al., 2017).

This research highlights the importance of food safety awareness and practices

among women. While half of the women demonstrated awareness of food safety principles, the study revealed that the actual implementation of safe practices remains inadequate. The association of diarrheal diseases with poor handwashing habits, as well as the presence of pests in the kitchen, emphasizes the critical need for targeted interventions to address these issues. The identified gaps in knowledge and practices further emphasize the necessity of well-designed educational programs to empower women with the necessary skills and understanding to ensure food safety within their households.

The findings of this study contribute valuable insights for policymakers, healthcare professionals, and public health organizations aiming to enhance food safety practices among women. Implementing targeted educational campaigns, promoting handwashing practices, and addressing cultural and socioeconomic factors can collectively contribute to a safer and healthier food environment for women and their families. By reducing the incidence of foodborne illnesses through improved food safety practices, it can make significant strides toward improving public health and overall well-being.

This study found that the prevalence of knowledge about food safety was adequate in only half of the study participants, and practices regarding food safety were found to be adequate in only one-third of them. Poor handwashing habits and the presence of pests in the kitchen increase the risk of diarrheal diseases. The study demonstrates the need for adequate health education and awareness regarding food safety.

AUTHOR CONTRIBUTION

The author contributes in data collection, processing, analysis.

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None.

CONFLICT OF INTEREST

None.

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