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Domestic Food Hygiene Practices in a Rural Area of Thrissur District, Kerala, India

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Abstract

Unsafe food has been a human health problem since history was first recorded, and many food safety problems encountered today are not new. More than 200 known diseases are transmitted through food. The chances of food contamination and cross-contamination become higher, especially in the lower socio-economic classes due to unsatisfactory environmental conditions, poor personal hygiene, poor quality and insufficient water supplies, unhygienic preparations, storage and feeding of foods. To find out the food hygiene practices of household food-handlers in a rural area of Thrissur district, Kerala, India. A community based cross-sectional study was conducted from November 2014 to April 2015 among 80 household food-handlers in a rural area of Thrissur district. A pre-tested semi-structured questionnaire based on WHO (World Health Organization) Food Safety Manual was used to collect data regarding kitchen and food hygiene practices. The study revealed that only less than half 37 (46%) had the desirable habit of always washing their hand before and during food preparation. Although majority 70 (87.5%) used to store raw and cooked foods separately, only less than half 39 (49%) used separate utensils and cutting boards for preparing raw and cooked foods. The results of the study showed that food hygiene practices should be improved in the community to safe guard them against food-borne diseases.

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Introduction

Unsafe food has been a human health problem since history was first recorded, and many food safety problems encountered today are not new. Although governments all over the world are doing their best to improve the safety of the food supply, the occurrence of food-borne disease remains a significant health issue in both developed and developing countries. It has been estimated that each year 1.8 million people die as a result of diarrheal diseases and most of these cases can be attributed to contaminated food or water. Proper food preparation can prevent most food borne diseases (Five

keys to safer food manual). More than 200 known diseases are transmitted through food. (Mead *et al.*, 1985).

The chances of food contamination and cross contamination, become higher especially in the lower socio-economic classes due to unsatisfactory environmental conditions, poor personal hygiene, poor quality and insufficient water supplies, unhygienic preparation storage and feeding of foods. (Khan Hameed, 1997; Lal *et al.*, 1996; Rowan *et al.*, 1997; UNICEF, 2000). Contaminated food presents one of the most common cause and major contributor to gastrointestinal

illness (e.g. acute diarrhea, nausea, vomiting and abdominal pain), compromised nutritional status and less resistance to disease and loss of productivity in the world today (Jacob, 1989). To a large extent gastrointestinal illness resulting from food contamination can be prevented if safe food-hygiene practices are followed at various stages of food purchase, storage, preparation and consumption (Mathee *et al.*, 2004).

The World Health Organization (WHO) has long been aware of the need to educate food handlers about their responsibilities for food safety. In the early 1990s, WHO developed the Ten Golden Rules for Safe Food Preparation and introduced the Five Keys to Safer Food in 2001. Recognizing the importance of safe food in human health, WHO has selected the theme of Food Safety for the World Health Day, 2015, with the objective of ensuring safety of food from farm to plate. Barring a few studies, little has been reported about the food hygiene practices in the community in India, and none so ever in Kerala (Mini Sheth and Monika Obrah, 2004; Sudershan *et al.*, 2008). The objective of this study was to find out the food hygiene practices of house hold food handlers in a rural area in Thrissur district of Kerala, India.

Materials and Methods

A community based cross sectional study was conducted among house hold food handlers Thrissur district, Kerala, India. The calculated sample size based on prevalence of separating utensils for raw and cooked foods was 80 (Kumiko Takashi *et al.*, 2009). From the 18 wards in a panchayat one ward was selected randomly by lottery method. From the selected ward, 80 households were selected by systematic random sampling. From each of the selected households, the person predominantly involved in food handling was selected for the study. A semi-structured questionnaire was used to collect data regarding socio-demographic characteristics, general sanitation practices and food hygiene practices based on the WHO Food Safety Manual. (Five Keys to Safer Food Manual, 2006)

Results and Discussion

Out of the 80 participants in the study, 16 (20%) were males and 64 (80%) were females. Mean age was 48.5 + 12.5. Majority 62 (77.5%) were Hindu by religion. 42 (52.5%) belonged to APL category. 26 (32.5%) were educated up to high school level. Most of the participants 35 (43.75%) were homemakers (Table 1).

In the study population 66 (82.5%) used boiled water for drinking. 66 (82.5%) of the respondents used to add un-boiled water to boiled drinking water. 23 (28%) said that their fingers would touch the stored drinking water during fetching.

Among those who owned a fridge 43 (67%) used un-boiled water for making ice used in beverages. 8 respondents (10%) allowed pet animals to enter the kitchen. 33 respondents (41%) did not have a waste basket in the kitchen, and out of them, only 9 respondents (19%) had a covered and foot operated waste basket (Table 2).

Out of the 80 respondents, only 37 respondents (46.0%) always used to wash their hands before and during food preparation. 58 (72%) always used to clean utensils used for food preparation before using for other food items.

While 39 (48.0%) always used separate utensils and cutting boards for raw and cooked foods, 15.0% (12) never used separate utensils for raw and cooked foods.

Out of the 64 respondents who owned a refrigerator, none of them used to thaw frozen food inside the refrigerator or other cool places (Table 3).

58 respondents (90% of those who owned a refrigerator) did not use to store cooked food in the refrigerator within two hours of cooking. 56 respondents (87.0%) used to cover the food inside refrigerator. Out of the 80 respondents, 54 (67%) used to check and throw away food beyond its expiry date. 69 (86%) always used to wash fruits and vegetables in safe water before eating them (Table 4).

The present study revealed that only 82% of the respondents used boiled water for drinking, and 82% used to add un-boiled water to the boiled drinking water. This could be due to the lack of awareness about the risk of contamination of boiled water by adding unboiled water.

Among those who owned a refrigerator, 67% used un-boiled water to make ice used for edible purposes. This practice is considered hazardous to health as the quality of un-boiled water is not reliable in India. In a study conducted in Hyderabad, it has been found that those who did not boil water consistently before drinking had a high prevalence rate of *Helicobacter pylori* infection in addition to the usual water-borne enteric infections (Ahmed *et al.*, 2007).

Table.1 Demographic characteristics of the study population

Demographic characteristics	Frequency [N = 80] N (%)
Gender	
Males	16 (20%)
Females	64 (80%)
Socioeconomic status	
APL	38 (47.5%)
BPL	42 (52.5%)
Education	
Professional	4 (5 %)
Graduate	7 (8.75%)
Higher secondary	12 (15 %)
High school	26 (32.5%)
Upper primary	11 (13.75 %)
Lower primary	20 (25 %)

Table.2 Sanitary conditions of the study population

Conditions of sanitation	
Water source	
Own well	62 (77.5%)
Panchayat well	6 (7.5 %)
Panchayat pipe	12 (15 %)
Boiling drinking water	
Yes	66 (82.5 %)
No	14 (17.5 %)
Adding un-boiled water to boiled drinking water	
Yes	66 (82.5 %)
No	14 (17.5 %)
Keeping drinking water covered	
Yes	76 (95 %)
No	4 (5 %)
Regular (daily) washing of the utensil in which drinking water is kept	
Yes	74 (92.5%)
No	6 (7.5 %)
Touching drinking water in the pot with fingers while collecting	
Yes	23 (28.75 %)
No	57 (71.25 %)
Type of water used for making ice [n =64]	
Boiled water	21 (32.8 %)
Un-boiled water	43 (67.2 %)
Have waste basket in the kitchen	
Yes	47 (58.75%)
No	33 (41.25%)
Type of waste basket [n =47]	
Uncovered	15 (31.9%)
Covered	23 (48.9%)
Covered and foot operated	9 (19.1%)

Table.3 Food hygiene practices among the study population

Food hygiene practice	Frequency
Washing hands before and during food preparation	
Always	37 (46.25%)
Most times	30 (37.50%)
Sometimes	9 (11.25%)
Never	4 (5%)
Cleaning surfaces and utensils used for food preparation before using on other food	
Always	58 (72.5%)
Most times	15 (18.75%)
Sometimes	4 (5.0 %)
Never	3 (3.75%)
Using separate utensils and cutting boards when preparing raw and cooked food	
Always	39 (48.75%)
Most times	20 (25 %)
Sometimes	9 (11.25%)
Never	12 (15 %)
Separating raw and cooked food during storage	
Always	70 (87.5%)
Most times	5 (6.25%)
Sometimes	1 (1.25%)
Never	4 (5 %)

Table.4 Food hygiene practices among the study population

Food hygiene practice	Frequency
Reheating cooked food until it is piping hot throughout	
Always	64(80.0%)
Most times	12 (15 %)
Sometimes	1 (1.25%)
Never	3 (3.75%)
Thawing frozen food in the refrigerator [n= 64]	
Yes	0 (0%)
No	64 (100%)
Storing cooked food in the fridge within two hours [n = 64]	
Yes	6 (9.37%)
No	58 (90.62%)
Keeping food covered in the fridge [n = 64]	
Yes	56 (87.5%)
No	8 (12.5%)
Check and throw away food beyond its expiry date	
Always	54 (67.5 %)
Most times	15 (18.75%)
Sometimes	5 (6.25%)
Never	6 (7.5%)
Washing fruits and vegetables in safe water before eating them	
Always	69(86.25%)
Most times	8(10 %)
Sometimes	1 (1.25%)
Never	2 (2.5 %)

Out of the 80 respondents, 95% kept drinking water in covered containers and 92.5% washed the container regularly. But 28.75% were using unhygienic method to draw water from the container. In a study done in Chandigarh, 88% of respondents covered their drinking water but nearly half of them used unhygienic method to draw water (Jasvir Kaur *et al.*, 2006). 10% of the respondents allowed pets in their kitchen and 41.25% did not have a waste basket in the kitchen. Among those who had a waste basket in the kitchen, 31.9% had an uncovered waste basket. In the study done in Chandigarh, unclean kitchen was significantly associated with gastrointestinal health complaints (Jasvir Kaur *et al.*, 2006).

Only 46.25% always washed their hands before and during food preparation. 77.5% used to clean surfaces and utensils used in food preparation before using on other food items. A study in United States reported that 66% respondents did not wash hands prior to handling food and majority had inadequately clean kitchen utensils (LiCohen and Bruhm, 2002). In a study done in Baroda, 77% of mothers had poor personal hygiene including inadequate hand washing while preparing food (Mini Sheth and Monika Obrah, 2004).

While 48% of respondents always used separate utensils and cutting boards for preparing raw and cooked food items, 15% never used. 87% always used to store raw and cooked food separately, while 5% never used to store them separately. A study reported that 42% mothers in a sub-urban area of Viet Nam did not use separate utensils for raw and cooked food and this was associated with increased incidence of diarrhea among children (Kumiko Takanashi *et al.*, 2009).

Only 9% of the respondents used to store cooked food in the refrigerator within two hours of cooking. 87% said that they always keep food covered in the fridge. 80% used to reheat cooked food until it is piping hot. But none of the respondents who owned a refrigerator with freezer used to thaw frozen food in the refrigerator. In a study done in Gujarat, 59% of respondents were unaware about the safe temperatures for heating leftover food for consumption and almost half didn't know about the safe duration of storage of cooked food at room temperature (Shriya *et al.*, 2014). A study in Hyderabad reported that over 60% stored leftover cooked foods at room temperature (Sudershan *et al.*, 2008). 67% of the respondents said that they always checked and threw packaged food beyond its expiry date, while 7.5% never did the same. A study reported that though 48% of

respondents in Hyderabad bought packed foods, majority (78%) of them did not acknowledge food labels (Sudershan *et al.*, 2008). In the present study, majority (86%) always used to wash fruits and vegetables in safe water before consuming them. In the study done in Gujarat, most of the respondents (78.9%) had very good practice of washing fruits and vegetables before use (Shriya *et al.*, 2014).

The present study was conducted to assess the food hygiene practices of domestic food handlers in a rural area of Thrissur, Kerala, India. The study revealed that only less than half (46%) had the desirable habit of always washing their hands before and during food preparation. Although majority (87.5%) used to store raw and cooked foods separately, only less than half (48.75%) used separate utensils and cutting boards for preparing raw and cooked food. The study results showed that food hygiene practices were inadequate in the population. This situation should be improved in the community to safe guard them against food-borne diseases. Creating awareness through health education and involving the community in spreading the message are essential.

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