

# Food Safety Knowledge and Practices among Primary Food Preparers of under-5 children in an Urbanized Village of Delhi

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**Abstract:** *Introduction:* Food safety aims at ensuring that all food is as safe as possible. Children under 5 years of age carry 40% of the foodborne disease burden, with 125 000 deaths every year. *Aim and objectives:* To assess the knowledge and practices regarding food safety in primary food preparers of under-5 children residing in Aliganj, field practice area of Vardhmann Mahavir Medical College and Safdarjung Hospital. *Materials and methods:* A community based cross sectional study was conducted among Primary food preparers for children under 5 years of age residing in Aliganj. Total of 110 food preparers were interviewed using a pre tested semi-structured questionnaire was used for data collection. *Results:* All the primary food preparers in the study were housewives, majority 54.5% belonged to 20-25 years, 87.3% women were literate, 95 (86.3%) were homemaker and 71 (64.5%) belonged lower middle class. Majority of women had correct knowledge and practice regarding separation of raw and cooked food, storing food in covered containers in fridge (57%), 33% had correct knowledge of storing food within 2 hrs. Most of women had correct knowledge regarding reheating of stored food before heating 83 (75.5%) and practice 65 (73.5%) but 13 (17.8%) practiced reheating food to correct temperature. *Conclusion:* There was found to be good practice and knowledge of separating raw and cooked food while a poor practice regarding storage, temperature of reheating stored food, reuse and reheating of cooking oil.

**Keywords:** food safety

## 1. Introduction

Food borne illnesses not only contribute to increased morbidity and mortality, they also affect socio-economic development.<sup>1</sup> They consist of illnesses arising due to bacteria, viruses, protozoa, helminths, prions as well as diseases due to added chemicals and pesticides. They can cause diarrhoea and also lead to various other consequences such as renal failure, liver failure, neurological disorders, arthritis etc. Chemicals, whether in the form of pesticides or as additives in food, can lead to non communicable diseases such as cancer, diseases affecting reproductive system as well as those affecting our immune system.<sup>2</sup>

WHO estimates about 32 disease conditions arising due to the various food borne hazards. Among these, diarrhoeal diseases, particularly due to Norovirus and Campylobacter, are the most common. Food safety aims at ensuring that all food is as safe as possible. An estimated 600 million – almost 1 in 10 people in the world – fall ill after eating contaminated food and 420 000 die every year, resulting in the loss of 33 million healthy life years (DALYs). Children under 5 years of age carry 40% of the food borne disease burden, with 125000 deaths every year. A very large proportion of food borne diseases occur due to improper handling of food at household/ commercial level.<sup>3</sup> While people of all ages are susceptible to unsafe food, the effect is much more in children who tend to be affected by the vicious cycle of diarrhoea and malnutrition. Keeping the above in mind, the study aimed to assess the knowledge and practices regarding food safety in primary food preparers of under-5 children, in accordance with 'Five Keys to Safer Food' as formulated by WHO.

## 2. Materials and Methods

A community based cross sectional study was conducted among Primary food preparers for children under 5 years of

age residing in Aliganj, field practice area of department of Community Medicine Vardhmann Mahavir Medical College and Safdarjung Hospital, Delhi. Data collection was done during August – September 2015. Since no study among primary food preparers of under five children was found, the 'sample size' was calculated using 'proportion formula for prevalence'; taking prevalence of 50% and absolute error as 10%. The sample size came out to be 100, to which a 10% non-response rate was added making a total sample size of 110. Aliganj has a total population of 6228 people, living in 1668 households (Baseline survey 2014 carried out by the Department) and 600 under five children. A child:household ratio of 3:1 was used, resulting in households visited for 110 children to be 330. Hence, every 5th house was visited, if the house was found locked or any child younger than 5 years old was not present in the household, the next house was visited. A pre-tested, semi-structured questionnaire was used for data collection. The primary food preparer was defined as the family member who prepares most of the meals of the family. The data collected was entered in MS excel and analyzed for mean, frequency and proportion.

## 3. Results

All the primary food preparers in the study were women in the age group 19-32 years. Majority of them (54.5%) belonged to the age group of 20-25 years. Out of the total women interviewed, 96 (87.3%) were literate, 95 (86.3%) were homemaker and 71 (64.5%) belonged lower middle class. (Table 1).

**Table 1:** Demographic profile of the study participants

| Sociodemographic characteristics | Number | %    |
|----------------------------------|--------|------|
| <b>Age(years)</b>                |        |      |
| <20                              | 1      | 9    |
| 20-25                            | 60     | 54.5 |
| 25-30                            | 38     | 34.5 |
| ≥30                              | 11     | 10   |

| Educational Status     |            |            |
|------------------------|------------|------------|
| Illiterate             | 14         | 12.7       |
| Literate               | 96         | 87.3       |
| Occupation             |            |            |
| Homemaker              | 95         | 86.3       |
| Housemaid              | 8          | 7.3        |
| Others                 | 7          | 6.3        |
| Socio-economic status* |            |            |
| Upper middle           | 38         | 28.2       |
| Lower middle           | 71         | 64.5       |
| Lower                  | 8          | 7.3        |
| <b>Total</b>           | <b>110</b> | <b>100</b> |

\*According to revised, Kuppuswamy scale (2014)

Half of the women interviewed, had correct knowledge and practice regarding separation of raw and cooked food (50.9%). Most women (~57%) knew that food should be stored in covered containers in refrigerator. Thirty three percent had correct knowledge of storing food within 2 hrs. As far as 'reheating stored food before consumption' is concerned, 83 (75.5%) had the adequate knowledge but only 65 (73.5%) actually practised it with only 13 women (17.8%) who practiced reheating food to correct temperature. Among 44 women who cooked non-vegetarian food, only 6 (13.6%) knew correct cooking point of chicken. The women also had incorrect knowledge and practise of 'reusing cooking oil' with as many as 63 women (57.3%) believing that cooking oil can be reused and 48 (43.6%) always reusing it (Table 2).

**Table 2:** Distribution of study subjects according to Knowledge and practices assessed regarding food safety as per WHO five keys

| Knowledge, attitude and practices assessed regarding food safety                     | Number | %    |
|--|--------|------|
| A1) Knowledge does raw food needs to be stored separately from cooked food           |        |      |
| Yes  | 56     | 50.9 |
| No   | 54     | 49.1 |
| A2) Fruits and vegetables separated from cooked food*                                |        |      |
| Always   | 75     | 68.2 |
| Never  | 23     | 20.9 |
| Sometimes  | 12     | 10.9 |
| B1) Method of Storage of leftover food (N=40)*                                       |        |      |
| -Open containers in fridge   | 1      | 2.5  |
| -Closed containers in fridge   | 23     | 57.5 |
| -Closed containers outside fridge  | 16     | 40   |
| B2) Food to be stored, can be refrigerated within what time (N=24)                   |        |      |
| Immediately  | 10     | 41.7 |
| Within 2 hours   | 8      | 33.3 |
| After 2 hours  | 6      | 25   |
| C) Reheating of stored cooked food   |        |      |
| C1) Knowledge whether food should be reheated before consumption (n=110)             |        |      |
| Yes should be reheated   | 83     | 75.5 |
| Should not be reheated   | 27     | 24.5 |
| C2) Practice about reheating food before consumption (n=83)                          |        |      |
| Always   | 61     | 73.5 |
| Never  | 10     | 12   |
| Sometimes  | 12     | 14.4 |
| C3) Practice regarding temperature to which food reheated before consumption (n=73)# |        |      |
| Room temperature   | 3      | 4.1  |

|   |    |      |
|---|----|------|
| Warm enough to eat  | 57 | 78.1 |
| Till steaming hot   | 13 | 17.8 |
| D) Knowledge about cooking temperatures of non-veg food (N=44)^ |    |      |
| D1) Cooking of chicken (n=44)                                   |    |      |
| Flesh is red  | 18 | 40.9 |
| Flesh is white  | 6  | 13.6 |
| Steaming if cut   | 8  | 18.2 |
| Others  | 6  | 13.6 |
| Don't know  | 6  | 13.6 |
| E) Reuse of cooking oil   |    |      |
| E1) Knowledge regarding reuse of cooking oil (N=110)            |    |      |
| Can be reused   | 63 | 57.3 |
| Should not be reused  | 38 | 34.5 |
| Don't know  | 9  | 8.2  |
| E2) Practice regarding reuse of cooking oil (N=110)             |    |      |
| Always reuse  | 48 | 43.6 |
| Never reuse   | 34 | 30.9 |
| Sometimes   | 28 | 25.5 |

\*only 40 out of 110 households used to have left over food, ^ 44 individuals cooked non vegetarian food and #73 are reheating out of 110

Majority of food handlers 72 (65.5%) always used same type of water for cooking and drinking, 55 (50%) drew water from glass without handle, majority 58 (52.7%) consumed water without purification. Majority 92 (82.7%) practiced washing vegetables in still water (Table 3).

**Table 3:** Other Practices regarding cooking/storage of food exercised by the respondents

| Other Practices  | Number | %    |
|--|--------|------|
| <b>1. Usage of same type of water for cooking and drinking</b>   |        |      |
| Always   | 72     | 65.5 |
| Never  | 36     | 32.7 |
| Sometimes  | 2      | 1.8  |
| <b>2. Distribution of study participants according to method of extraction of drinking water (n=110)</b> |        |      |
| Tap  | 22     | 22   |
| Glass without handle   | 55     | 50   |
| Mug with handle  | 23     | 30   |
| <b>3. Purification of water (n=110)</b>  |        |      |
| Consume after purification   | 52     | 47.3 |
| Consume without purification   | 58     | 52.7 |
| <b>4. Method used for Purification of water (n=52)</b>   |        |      |
| Boiling  | 5      | 9.6  |
| Aqua guard   | 30     | 57.7 |
| RO   | 5      | 9.6  |
| Candle filter  | 12     | 23.1 |
| <b>5. Practice of washing fruits and vegetables after buying</b>   |        |      |
| Wash with still water  | 91     | 82.7 |
| Wash with running water  | 14     | 12.7 |
| Don't wash   | 5      | 4.6  |

Majority of women cleaned hands 101 (91.8%), keep nails trimmed 95 (86.4%), tying and covering hair 96 (97.3%), hand washing with soap 98 (89.1%) before food preparation (Table 4).

**Table 4:** Hygiene practices while cooking food (n=110)

| Hygiene practices while cooking food<br>(n=110)                       | Number | %    |
|---|--------|------|
| <b>1. Cleaning hands before preparing food (n=110)</b>                |        |      |
| Yes   | 101    | 91.8 |
| No  | 9      | 8.2  |
| <b>2. Keeping nails trimmed and clean while preparing food(n=110)</b> |        |      |
| Yes   | 95     | 86.4 |
| No  | 15     | 13.6 |
| <b>3. Tying and covering hair while preparing food (n=110)</b>        |        |      |
| Yes   | 96     | 87.3 |
| No  | 14     | 12.7 |
| <b>4. Removing ring and jewelry while preparing food (n=110)</b>      |        |      |
| Yes   | 55     | 50   |
| No  | 55     | 50   |
| <b>5. Hand washing practices before food preparation (n=110)</b>      |        |      |
| Yes   | 106    | 96.4 |
| No  | 4      | 3.6  |
| <b>6. Practice of hand washing</b>                                    |        |      |
| Wash with soap  | 98     | 89.1 |
| With water  | 11     | 10   |
| <b>7. Washing after using toilet</b>                                  |        |      |
| Yes   | 108    | 98.2 |
| No  | 2      | 1.8  |

#### 4. Discussion

Majority of the study participants had both the knowledge and followed the practice of separating raw food from cooked food. All the participants who stored left over food had knowledge about reheating food before consumption and also followed it as a practice. However, they were not aware about the temperature up to which the food should be reheated and also the reason behind it. In their study conducted among women, Sarada Vadlaman et al<sup>2</sup> had also found a gap between correct knowledge (94.7%) and good practice (30.7%). In their study, 32% women always separated raw and cooked food despite 94.7% having the knowledge of the same. However, in our study, even though only 50.9% women knew that food should be separated, as many as 68.2% practiced separation of food as a habit. A gap was also found in the number of participants having the knowledge regarding reheating stored food versus those actually practicing it. While 83 (75.5%) women had the knowledge, 65 (73.5%) actually reheated stored food. The study also revealed that some participants (17.8%) were not aware of correct temperature to which food should be reheated. Percentage of participants always reheating stored, cooked food were only 16% in the study conducted by Sarada Vadlaman et al.<sup>4</sup> In the present study majority of the mothers of under five children practiced washing fruits and vegetables after buying (95.4%), similar findings were observed by Sudershan RV et al. that mothers of under five children practiced washing vegetables (86.8%) and fruits (75.7%) before consumption<sup>5</sup> while Sarada Vadlaman et al found 48.7% always washed fruits and vegetables before eating.<sup>4</sup> In our study 90% of the study participants use water and soap to wash their hands before food preparation. While Sudershan RV et al. observed that majority of mothers washed their hands before feeding the child (86%) but more than 75% washed hands only with water.<sup>5</sup> They observed that even after using toilet, only 50% used soap<sup>3</sup> while in our study 89.1% participants washed hands with soap. Sheethal

M P et al. in their study conducted among Aanganwadi workers, found all of them had practice of hand washing before cutting vegetables, handling food and after defecation.<sup>6</sup> However, Sarada Vadlaman et al. observed 97.3% had knowledge regarding importance of hand washing during handling of food but only 45.3% of them practiced it.<sup>4</sup>

#### 5. Conclusion

The participants exhibited a few good attributes and a few bad ones. Good knowledge and practice was found pertaining to separation of raw and cooked food but poor knowledge and practices were seen in the areas of storage and reheating of cooked food, especially regarding the temperature to which food should be reheated. Poor knowledge and practice regarding reuse of cooking oil was also observed in the study participants.

#### 6. Limitations and Strength

There is a possibility of recall bias. The study can be used for conducting health talks and health education program and to assess KAP before and after application of such programs of risk communication. Discussing food safety with primary food preparers also make them conscious of their practices and also highlights the implications of basic hygiene of food preparer on the health of the entire family.

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