



## Capacity building of food handlers on food safety at mass catering establishments of urban Vadodara

### KEYWORDS

Food handlers, food safety, IEC

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### ABSTRACT

*Effectiveness of Food Safety Education imparted to food handlers of Mass Catering Establishments (MCE) of Vadodara city was studied to reduce the growing incidences of Food borne illnesses. A questionnaire was used to gather data regarding food safety knowledge and hygiene aspects at the baseline and post intervention using power point presentations, 6 minutes video film and booklet during one day seminar followed by reinforcement of food safety messages after a period of 15 days. Baseline survey revealed that majority of food handlers scored poorly regarding knowledge on food hygiene (57.8%), personal hygiene (53.3%) and environmental hygiene (62.2%). Only 29% subjects adhered to personal hygiene practices. FSE brought about statistically significant improvement ( $p<0.001$ ) in their overall knowledge scores (8.0%) regarding four hygiene aspects.*

### INTRODUCTION

With increase in number of food borne illnesses, governments all over the world are intensifying their efforts to improve food safety. In order to ensure that the food sectors match up to the best global standards, the Government of India enacted an integrated food law called the Food Safety and Standards Act in August 2006 and implemented in 2011.

Mass Catering Establishments (MCEs) units serve bulk and variety of food to the masses at a time in social gatherings. Due to tremendous competition among mass caterers, they sometimes agree to serve to people poor quality of food by compromising on staff strength, using poor quality raw materials and employing untrained food handlers.

### METHODS AND MATERIALS

A cross sectional study design was used and 45 food handlers were conveniently selected from 120 MCE units registered under Vadodara Catering Association.

### Tools used for survey

A semi-structured questionnaire was formulated wherein data was collected using face to face interview method to elicit information on the food safety knowledge of food handlers. Knowledge regarding unit hygiene included knowledge of appropriate unit, type of dustbins, frequency of washing kitchen premise with appropriate sanitizers, pest control and source of potable water for drinking and cooking.

Knowledge regarding food hygiene covered aspects like sources of food spoilage and cross contamination, procurement of raw food materials, refrigeration, adulteration and use of permissible artificial colors and their limits.

Knowledge regarding personal hygiene included bad habits to be avoided and importance of protective clothing while working in kitchen, hand washing frequency, storage of non-food items like sanitizers. Knowledge regarding environmen-

tal hygiene included appropriate surroundings of the kitchen.

Checklist was formulated to record practice regarding food hygiene, personal hygiene and hand washing activities.,

### Development and use of Information, Education and Communication materials for food safety training

A 6 minutes documentary film on safe cooking and serving was developed titled "pakaau film".

The film focused on information about the types of microorganisms namely bacteria, fungi, viruses and protozoa which spoils the food and make unfit for human consumption and mild to severe symptoms of food borne illnesses. Film also depicted how cross contamination in food takes place and how to prepare food in safe and hygienic place and condition.

A booklet comprising of detailed food safety messages in pictorial form and in three languages namely Hindi, Gujarati and English was distributed for home learning.

Intervention program One day seminar was conducted to impart education on various aspects of food safety and food safety laws using the IEC materials developed. After 15 days of seminar, food safety messages were reinforced using posters. The post intervention data was collected after a period of one month of intervention as per baseline. The impact of intervention on changes in knowledge on food safety was assessed. Food handler's knowledge was ranked as good, fair and poor as per the scores allotted -Good (> 65), Fair (55 to 64) and Poor (< 54).

### RESULTS

#### General information of food handlers:

Majority of them were males (71.1%) with 51% of them in the age group of 17-30 years. Most of them (78%) received primary level education, 64.4% had less than 10 years experi-

ence in catering business and 54% were not aware of FSSAI act.

#### **Baseline Knowledge scores:**

Majority of food handlers scored poorly for personal hygiene and food hygiene on most of the aspects such as knowledge regarding importance of ventilation and its netting, cross contamination in foods, refrigeration of foods, artificial permissible colors and permissible limits in which is to be used in cooking.

The overall score of food handlers indicates that they have fair knowledge regarding unit hygiene and least regarding environment hygiene.

#### **Association between socio-economic parameters and hygiene knowledge of food handlers.**

Practically no food handlers had good hygiene scores. Their hygiene scores ranked from fair to poor. No significant association was seen between education, experience, FSSAI knowledge, sex and hygiene scores of food handlers. However a significant association ( $p<0.05$ ) was observed between food hygiene scores and FSSAI awareness.

#### **Correlation between socio economic profile and hygiene knowledge.**

No significant correlation was found between educational

level of food handlers and their hygiene knowledge.

A positive significant correlation ( $p<0.05$ ) was found between years of experience of the food handlers and their unit hygiene and food hygiene scores as well as between FSSAI awareness and food hygiene scores.

#### **Practices followed by the food handlers regarding food hygiene and food safety working at mass catering establishments.**

Around 63.5% of food handlers kept cooked foods away from raw foods. Reusing of cooking oil was practiced by 70% food handlers, 61% did not cover foods to protect from contamination and 89% stored non food items away from food supplies.

#### **Observations on pre-preparation and preparation practice of food handlers.**

As seen in Table 1, majority of food handlers (87%) washed and cleaned food items before use, 82% did not maintain cleanliness of chopping area and chopping boards, (53%) avoided keeping food containers on floor, (73%) made use of hands instead of spoons for picking up foods like sugar, spices etc .and 56% capped spice bottles immediately after use.

**Table 1: Observations on pre-preparation and preparation practice of food handlers of structured and unstructured unit**

Sr.No	Food safety Aspects	Structured (n=29)		Unstructured (n=11)	
		Yes	No	Yes	No
1	Washing/ cleaning of various food items before use.	27 (93.1)	2 (6.9)	9 (81.8)	2 (18.2)
2	Covering of food items and food containers	13 (44.8)	16 (55.2)	7 (63.6)	4 (36.4)
3	Cleanliness of the chopping area and chopping boards	5 (17.2)	24 (82.8)	2 (18.2)	9 (81.8)
4	Placement of containers containing food on the floor	6 (20.7)	23 (79.3)	8 (73.7)	3 (27.3)
5	Capping masala boxes; bottles etc immediately after use	17 (58.6)	12 (41.4)	6 (54.5)	5 (45.5)
6	Use of hands instead of spoons for picking up foods like sugar, spices etc.	21 (72.4)	8 (27.6)	8 (73.7)	3 (27.3)
7	Use of hot water for cleaning utensils	16 (55.2)	13 (44.8)	7 (63.6)	4 (36.4)

**NOTE- The figures in the parenthesis indicates percentage**

Practices regarding personal hygiene in MCE showed that only 13.8% of food handlers wore uniform, (45%) spat around the food materials, 38% workers chewed betel leaves, tobacco chewing gums while cooking and overall 29% adhered to good personal hygiene.

Majority of the MCE units did not observe cleanliness at receiving area (61%), storage area (60%), pre-preparation (72%), and dishwashing area (90.3%). However preparation area (58.6%) and service area (75.9%) looked clean.

Majority of the food handlers (85%) washed their hand with soap after visiting toilets, 66% wash their hands with water only after touching food waste and refuse and 80% did not wash hand after tasting/eating dry foods and smoke.

Post intervention: The total hygiene knowledge scores of the food handlers increased by 8%. Maximum percent increase was observed for environmental hygiene (EH) (26.5%). Unit hygiene (UH), food hygiene (FH) and personal hygiene (PH) percent scores increased significantly ( $p<0.001$ ) by 9.9%, 5.7% and 7.4% respectively (Table 2).

**Table 2 Impact of training on various aspects of food safety related to knowledge of food handlers**

(n= 45).

Total Knowledge scores	Mean±SD		Paired 't' Test	% increase
	Pre (n=45)	Post (n=45)		
UH scores Max score =18	9.51±1.83 (52.8)	11.28±1.80 (62.7)	7.69***	9.9↑
FH score Max score = 30	14±2 (46.7)	15.71±2.47 (52.4)	7.75***	5.7↑
PH score Max score =15	6.44±1.03 (42.9)	7.55±1.12 (50.3)	5.56***	7.4↑

EH score Max score = 2	0.49±0.37 (24.5)	1.02±0.54 (51)	5.59***	26.5 ↑
Total=65	30.32 (46.6)	35.54 (54.7)		8.1 ↑

\*\*\*significant at  $p<0.001$ , NS- not significant.

NOTE: the figures in parenthesis denote the mean percent scores.

After food safety training, food handlers showed a shift of 11.1%, 28.8%, 35.6% and 48.9% from poor category towards fair and good category for their unit hygiene, food hygiene, personal hygiene and environmental hygiene scores respectively. (Table 3)

**Table 3: Ranking of food handlers for knowledge scores on various aspects of hygiene before and after FSET. (BF- Before and AF-After).**

	Good N(%)			Fair N(%)			Poor N(%)		
	BF	AF	% ↑ or ↓	BF	A	% ↑ or ↓	BF	A	% ↑ or ↓
UH	1 (2.2)	10 (22.2)	20 ↑	34 (75.6)	35 (77.7)	2.1 ↑	10 (22.2)	5 (11.1)	11.1 ↓
FH	0	3 (6.6)	6.6 ↑	19 (42.2)	29 (64.4)	22.2 ↑	26 (57.8)	13 (29)	28.8 ↓
PH	0	1 (2.2)	2.2 ↑	21 (46.7)	36 (80)	31.3 ↑	24 (53.3)	8 (17.7)	35.6 ↓
EH	0	7 (15.5)	15.5 ↑	17 (37.8)	32 (71.1)	33.3 ↑	28 (62.2)	6 (13.3)	48.9 ↓

NOTE- The figures in parenthesis indicates percentage.

## DISCUSSION

The study reports that for many of the aspects of food hygiene, food handlers had poor knowledge regarding cross contamination of foods (37.5%), bare hands to be avoided (6.5%) during food preparation, keeping cooked and raw foods separately (18.5%) and refrigeration of food (20%). Contradictory to the study, Tans S et al, (2013) reported that respondents knew that the use of glove was to prevent bare hand contacts (80%) and can reduce risk of food contamination (88%) However, a study by Sheth M, Sukul S and Patel R, (2007) reported that 73% of food handlers had poor knowledge for food hygiene aspects namely prevention of food spoilage (77%) and micro-organisms (92%). The overall knowledge of food handlers in our study was poor (46.6%) which is higher than 43.4 % (n=764) as reported for food handlers in Turkey (Bas M et al 2006) and lower than 56.5% and 62.5% knowledge scores as reported for food handlers in catering company (n=101) and small businesses (n=79) in Portugal, respectively. (Martins R et al, 2012; Gomes N et al, 2007.)

A modest increase in knowledge scores (8%) in all the four hygiene was observed. A study by Sung, Tong- Kyung and Chang among food handlers of Korea in 2010 showed an increase in knowledge of the food handlers from 49.3% to 66.6% two weeks after a training program on food safety. Another study by Malhotra R et al in New Delhi in 2008 among food handlers revealed 12% increase in food safety knowledge after 3 months intervention program along with increased hand hygiene practices. FSET in this study made a significant impact and this could be due to various channels used for imparting the same. Responses of the food handlers showed that video film is the most preferred medium among the other two channels for imparting FSE training. According to them the messages shown in the film were more easily understood. For sustainable effect of food safety education training may be imparted at the work place by the employers themselves, and it should be on a regular basis.

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