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## Knowledge, attitude and practice of food safety among institutional and prospective food handlers

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### Abstract

Food service industry in India is one of the most important sectors. Food handlers form an essential part of this industry since they play a crucial link from farm to fork in the food chain. The study aim was to assess knowledge, attitude and practice of food safety among the institutional and prospective food handlers. A purposive random sampling technique was employed to select a total of 100 respondents - 50 institutional food handlers (IFH) and 50 prospective food handlers (PFH) at selected institutions in New Delhi, India. Pre-tested questionnaire was used to collect information on socio-demographic characteristics, knowledge, attitude and practice of food safety. The statistical analysis tests included Chi-square ( $\chi^2$ ) test and Karl Pearson's Correlation Coefficient (r). The findings of the study indicated male dominance in study population with majority being graduates with 1 – 2 years of experience. Knowledge, attitude and practice score was significantly higher among IFH than PFH ( $p < 0.05$ ). With respect to knowledge, attitude and practices, a higher degree of positive correlation was observed among IFH as compared to PFH. In IFH, the correlation between knowledge and practice was higher than other variables. The study highlighted that substantial gaps in food safety concepts were observed among PFH. Hence, an ongoing training and curriculum enhancement on food safety is the need of the hour for food handlers to ensure safe food to the community.

**Keywords:** Institutional food handlers, prospective food handlers, food safety, community, institutions

### Introduction

Food service industry in India is one of the most vibrantly growing business that has seen enormous rise over the past decade and is predicted to outgrow during the forecast period. The current trends of living have encouraged the people to take advantage of buying convenience food and eating in restaurants which has equally increased the chances of contamination. The food handlers have become an essential part of the food industry at production, preparation and distribution levels. In fact, they serve as crucial links from farm to fork in the food chain especially in food safety.

Food safety and hygiene is an international concern and is the responsibility of all the people involved in food preparation and serving operations to take care of hygiene to assure safety of food. It is the measure taken to ensure that the prepared and served food will not cause sickness or harm to the consumer when it has been eaten according to its intended use (WHO, 2006) [1]. It plays a critical role in assuring that the prepared food stays safe at all the stages of food chain, from production, harvest, processing, storage, distribution to its preparation and consumption. Food handlers play a major role in prevention and controlling the outburst of food poisoning during production and distribution of food or can act as asymptomatic carriers of foodborne disease-causing pathogens.

According to World Health Organization, 2.2 million deaths which include death of 1.8 million children occurs due to foodborne and waterborne illness. Food illnesses are defined as diseases, either toxic or infectious in nature caused by agents that enter the body through ingestion of contaminated food (WHO, 2006) [1].

World Health Organization (WHO) has identified five factors that majorly contribute to illnesses. These include - improper cooking procedures, lack of hygiene and sanitation by food handlers, acquiring food from unsafe sources, cross-contamination between raw and ready-to-

eat foods and temperature abuse during storage. The above practices are directly related to the behavior of food handler <sup>[1]</sup>. It is believed that good knowledge of food safety among the food handlers is of prime importance to avoid any negative consequences regarding foodborne illnesses. Thus, the overall aim of the study was to assess the knowledge, attitude and practice of food safety among institutional and prospective food handlers.

### Methodology

A random purposive sampling method was employed to 100 respondents (50 institutional and 50 prospective food handlers) in various institutions in New Delhi, India. A pre-designed questionnaire was used to elicit information from the respondents. The questionnaire was designed in a way that it includes sets of questions which were simple to interpret by the respondents.

The questionnaire was organized into four distinct parts: demographic information, knowledge on food safety, attitude towards food safety and food safety practices.

The questions that addressed knowledge, attitude and practices of food safety were adapted from questionnaire provided in Five Keys to Safer Food Manual by World Health Organization (WHO, 2006).

The demographic information captured the information like name, age, gender, marital status, educational background and medical check-up.

The knowledge section focused on the knowledge of food handlers about the various principles of food safety. 11 statements were used to elicit the respondent's knowledge on food safety concepts like clean, separate, cook, safe temperature and use of safe water. The responses provided

were Yes or No. One (1) and zero (0) mark were given for correct and incorrect answers respectively. The overall knowledge was calculated by summing the total score.

The attitude section consisted of 10 statements that aimed to determine the understanding and attitude of food handlers on food safety and were graded using agree, not sure and disagree. The overall attitude was calculated by summing the total score.

The practice section included 11 statements pertaining to food safety practices of respondents which were assessed using always, most times, sometimes, not often and never. The overall practice was calculated by summing the total score.

The collected data was analyzed and subjected to chi-square ( $\chi^2$ ) and Karl-Pearson's Coefficient (r) test. Results with a p-value <0.05 were considered to be statistically significant.

### Results and Discussion

Table-1 indicates that more than half (52%) of the IFH respondents were in the age group of 22-26 years and the PFH respondents were in the range of 19-21 years. Male dominance was reflected in both IFH (100%) and PFH (only 10% were females). Similar results were seen in study by Legesse *et al.*, (2017) in which majority of food handlers were male in the age group of 18-24 years <sup>[2]</sup>.

70% of the IFH and all PFH respondents were graduates with 64% of IFH and all the PFH with one to two years of work experience. Most of the IFH and 50% of PFH respondents had the job responsibility of cooking (52%) followed by food service (36%). Similar results were seen in study by Lee *et al.*, (2017) <sup>[3]</sup> in which majority of food handlers were involved in cooking followed by food service <sup>[3]</sup>.

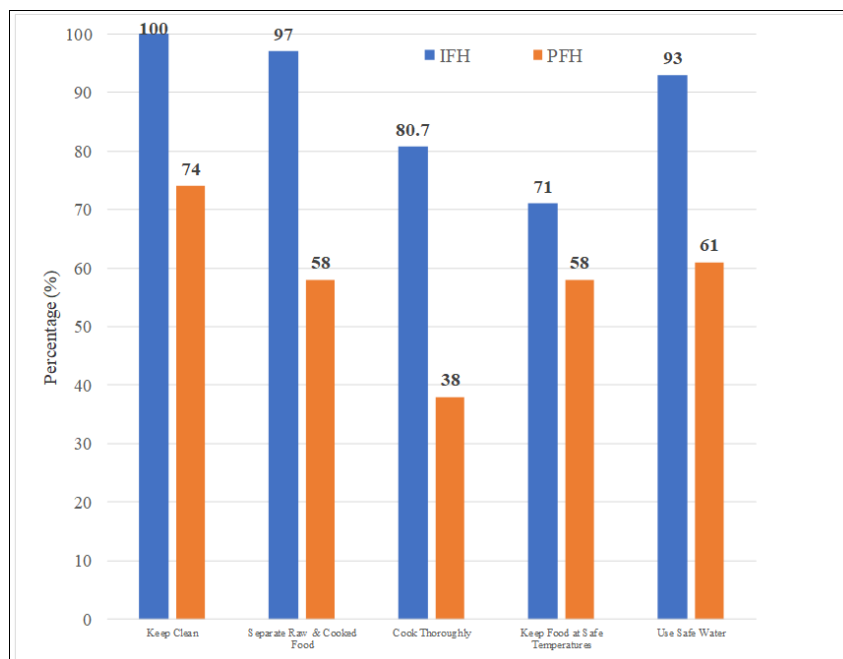
**Table 1:** Baseline Information

Characteristics	Category	Respondents			
		IFH (n=50)		PFH (n=50)	
		N	%	n	%
Age group (years)	19-21	0	0.0	50	100.00
	22-26	26	52.0	0	0.0
	27+	24	48.0	0	0.0
Gender	Male	50	100.00	45	90.0
	Female	0	0.0	5	10.0
Marital status	Single	32	64.0	50	100.00
	Married	18	36.0	0	0.0
Qualification	PUC/ Diploma	7	14.0	0	0.0
	Graduation	35	70.0	50	100.00
	Post-graduation	8	16.0	0	0.0
Work experience (years)	1-2	24	48.0	50	100.00
	3-6	15	30.0	0	0.0
	7+	11	22.0	0	0.0
Job responsibility	Cooking	26	52.0	14	28.0
	Serving food	18	36.0	11	22.0
	Preparing ingredients	0	0.0	5	10.0
	Other	6	12.0	20	40.0
Medical check up	Yes	50	100.00	45	90.0
	No	0	0.0	5	10.0

IFH – Institutional Food Handlers, PFH – Prospective Food Handlers

It was encouraging to note that all the IFH and 70% of the PFH underwent medical checkup in the recent time. Similar

results were seen in study by Legesse *et al.*, (2017) wherein majority of the respondents underwent medical checkup <sup>[2]</sup>.

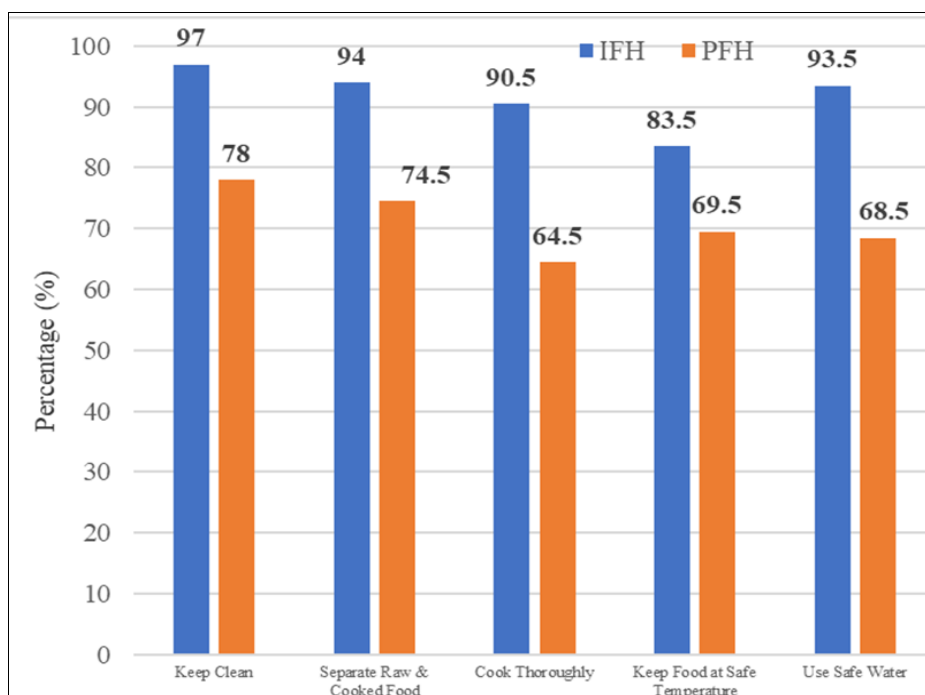


IFH – Institutional Food Handlers, PFH – Prospective Food Handlers,

**Fig 1: Knowledge on Food Safety**

Fig.1 depicts the knowledge of food handlers on food safety and its concepts. The results indicated that majority of the IFH respondents had fairly good knowledge when compared to PFH. The level of greater knowledge among IFH can be attributed to the workplace and the work environment. The ongoing process of enhancing knowledge by organizing regular training sessions and workshops for food handlers in the food industry is the major reason for their greater knowledge. Owing to regular training sessions and workshops undertaken by the institution, the knowledge of IFH respondents remain at pace with the ongoing trends in the food industry. Since, the PFH have exposure to the similar set of educational modules, therefore the knowledge is found to be comparatively less. Statistically significant data was obtained among the two groups at 5% level.

Similar results were seen in study Sharif *et al.*, (2013)<sup>[4]</sup> and Panchal *et al.*, (2013)<sup>[5]</sup> where food handlers had a fairly high knowledge score of 84.83% and 71% respectively<sup>[4, 5]</sup>. Moderate to low level of overall knowledge was depicted in studies by Osaili *et al.*, (2013) and Hassan *et al.*, (2014) where the food handlers’ knowledge score was found to be 69.4% and 53.6% respectively<sup>[6, 7]</sup>. In a study conducted at a hospital in Nairobi, Kenya it was observed that food handlers performed well in knowledge items compared to the hygienic practices which indicated that knowledge in food hygiene does not always result in a positive change in food handling practices. Hence, there is a need for educational programmes to improve not only knowledge but emphasize on translation to practices. (Githiri *et al.*, 2013)

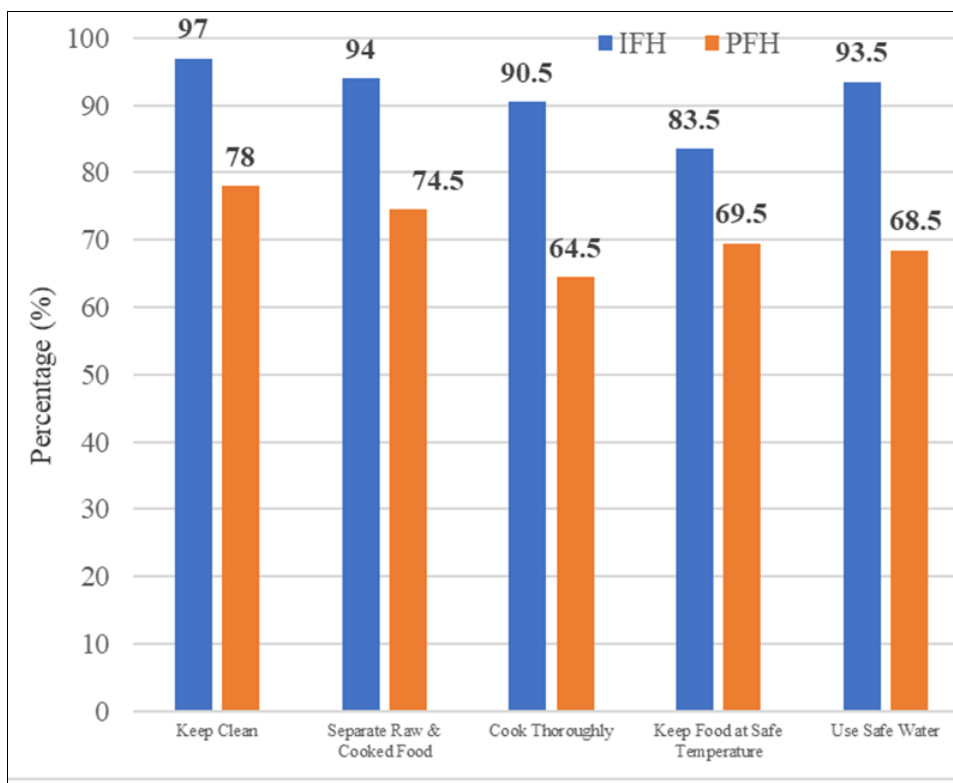


IFH – Institutional Food Handlers, PFH – Prospective Food Handlers

**Fig 2: Attitude towards Food Safety**

Fig.2 depicts the attitude of study subjects on various principles of food safety. It was observed IFH respondents have a greater positive attitude than PFH. The reason could be due to the fact that institutional respondents have been in this profession and therefore possess a stronger positive attitude towards food safety. Statistically significant difference was seen on all the concepts of food safety at 5% level.

In study by Sharif *et al.* (2013)<sup>[4]</sup>, it was noted that response of food handlers to the attitude questionnaire was found to be high with mean percentage of 88.9%.<sup>[4]</sup> In contrast, the study by Akabanda *et al.*, (2017) showed that general attitude of food handlers towards food safety was found to be satisfactory<sup>[9]</sup>.



IFH – Institutional Food Handlers, PFH – Prospective Food Handlers

**Fig 3: Food Safety Practices**

Fig.3 indicates self- reported practices of study subjects in relation with principles of food safety. The data depicted that IFH practice food safety principles in their day-to-day life. Exposure to the professional world is the major reason for showing a higher percentage of self-reported practice when compared to PFH. Statistically significant data was obtained among the two groups on all the aspects of food safety principles at 5% level. ( $p < 0.05$ )

Related results were seen in study by Sharif *et al.*, (2013)<sup>[4]</sup> where the food handlers practiced good hygiene level with an overall score of 89.4%.<sup>4</sup> In contrary, satisfactory results in the domain of food safety practices were observed in the food handlers in study by Akabanda *et al.*, (2017)<sup>[9]</sup>. Inadequate sanitary practices of food handlers were observed in schools of Camacri, Brazil, highlighting the need to review the current model for training food handlers and to improve accessibility to sinks and supplies to ensure proper hygiene. (Lilian Sorres *et al.*, 2012)<sup>[10]</sup>

In a study among food handlers in Dubai, good cooking practices of food hygiene were observed but with a need for improvement of personal and general hygienic practices through training and retraining of food handlers by the management of the food facilities and the local governmental authorities. (Al Suwaidi *et al.*, 2012)<sup>[11]</sup>.

Table-2 depicts the association between knowledge, attitude and practice on food safety among IFH and PFH.

It is evident that there exists higher positive correlation between knowledge and attitude ( $r = +0.472^*$ ), knowledge and practice ( $r = +0.538^*$ ) and also attitude vs practice ( $r =$

$+0.484^*$ ) among IFH respondents on food safety. Interestingly, the strongest positive correlation exists between knowledge and practice among the IFH ( $r = +0.538^*$ ) and PFH ( $r = +0.376^*$ ). This association shows that food handlers with good knowledge will have positive attitude and good practices behavior respectively.

**Table 2: Knowledge, Attitude and Practice on Food Safety**  
N=100

Aspects	Correlation coefficient (r)		
	IFH	PFH	Combined
Knowledge & Attitude	+ 0.472*	+ 0.356*	+ 0.470*
Knowledge & Practice	+ 0.538*	+ 0.376*	+ 0.582*
Attitude & Practice	+ 0.484*	+ 0.331*	+ 0.423*

\* Significant at 5% level

The results indicated that a positive statistically significant relationship exists between knowledge and attitude ( $r = +0.470^*$ ) as compared to knowledge and practice ( $r = +0.582^*$ ) and attitude and practice ( $r = +0.423^*$ ) on food safety among the two groups. Hence, higher the knowledge better is the attitude, and more is the practice among the respondents on food safety.

A study by Ituma *et al.*, (2017) demonstrated the effectiveness of training in improving food handlers' knowledge, attitude and practice of food hygiene and safety. It is therefore recommended that management of restaurants, regulatory agencies and government should provide regular training to food handlers<sup>[12]</sup>. Verghese *et al.*, (2013) in their study

concluded that the information booklet was effective to improve the knowledge and knowledge of practice on food safety among the food handlers <sup>[13]</sup>.

### Conclusion

In view of the present findings, it could be concluded that the overall knowledge, attitude and practice score was significantly higher among institutional than prospective respondents. Higher degree of positive correlation was observed among IFH for knowledge, attitude and practice. the study also highlighted significant gaps in food safety concepts among PFH respondents. Thus, enhancement of curriculum along with promotion of nutrition education and intervention should be encouraged to inculcate effective food safety practices among the food handlers.

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