

Adoption of Food Safety and Hygiene Practices in Food Service Operations

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Abstract: Food is basic necessity for growth, development, and progression. Food safety is a scientific discipline describing handling, preparation, and storage of food in ways that prevent food borne illnesses. Since the dawn of human history, food borne diseases have been a problem for all societies, and it is an increasing public health issue worldwide. Literature indicates that poor food handling and sanitation practices are more common among food handlers in developing countries resulting in food - borne illness. Hence the study was undertaken with the objectives to evaluate the hygiene practices practiced in food service operations during COVID 19 outbreak and to understand the food safety concerns and satisfaction by the consumers. A total of 50 food handlers, 10 food delivery personnel and 40 customers were selected randomly from food establishments at the study area, Krishnagiri, Tamil Nadu. Appropriate questionnaires were designed to collect details on existing food safety and hygiene practices among food handlers, food delivery personnel and customers. Education on food safety and hygiene practices and personal hygiene were provided to food handlers, to food delivery and to the selected customers, it was imparted through pamphlets. This study revealed that the overall knowledge, practices, and attitude towards food safety among food handlers, food delivery personnel and customers were average. There was a significant association between knowledge and practice while food safety practices were independent with an attitude among the food service employees and food delivery personnel. Creating awareness and proper education strategies to the food handlers, food delivery personnel and customers will prevent contamination and thereby ensure the service of safe and quality foods to the public. Good lifestyle practices can enhance the quality of health among the generation at all times and especially during this COVID – 19 pandemic.

Keywords: Food safety, sanitation practices, food handlers, consumer's satisfaction, food delivery personnel.

1. Introduction

Food is basic necessity for growth, development, and progression. Every living thing on the face of the earth, irrespective of whether it belongs to the plant or animal kingdom, needs food to survive, grow, and reproduce. Food safety in between market and consumers is very vital because food can transmit disease from person to person as well as serve as a growth medium for bacteria that can cause food poisoning. In developed countries, Food Safety Standards Authority has developed standards for food preparation, whereas in developing countries the main issue is simply availability of adequate safe water which is usually a critical item. WHO reports that in developing countries it was estimated that 70 per cent of the diarrheal cases are associated with the consumption of contaminated food.

In order to create a baseline standard for food preparation, WHO listed the five key points for ensuring food safety. They are as follows always maintain cleanliness in food handling area, separate raw and cooked food, cook food thoroughly, store food at a safe temperature to kill pathogens, use safe water and raw materials. Any person involved in food preparation should follow these five keys for the production of safe food.

Food safety should be ensured at all level of production even in small scale industries. Because of the changing lifestyle the percentage of people who take meals outside their homes has increased in recent years. Hence the restaurants are flourishing in all corners of our streets. The restaurant foods are not only appreciated for their unique flavours, convenience and the role which they play in the cultural and social heritage of societies, but also they have become important and essential for maintain nutritional status of

population. The restaurant foods provide a source of affordable nutrients to the majority of people especially the low - income groups in developing countries.

2. Materials and Methods

1) Selection of study area and study participants:

The area selected for the survey was various Restaurants in Krishnagiri, Tamilnadu State. A total of 110 study participants were selected through a Selective purposive sampling technique in the selected areas. In this research about 5 Food Service Establishments were selected and the sample size is about 100. These 5 outlets constituted the primary sample for the study and detailed observation of the Food Service Establishment regarding the Food Safety and Hygiene practices by the Food Service Employees and the delivery personnel was made. The consumers are important stake holders in the Food Service Establishment. Forty consumers who frequently visited the street food outlets were randomly approached and asked to voluntarily participate in the study. Eight consumers were selected from each of the Five Food Service Establishment for this purpose comprising a total sample size of forty consumers.

2) Design of the study

Research design is a master plan specifying the methods and procedures for collection and analysing the needed information. Anything that becomes a means of collecting information for a study is called a research tool or a research design. A well - structured questionnaire was prepared by the investigator as a research tool and the questionnaire comprise of General information of the respondents, socio - economic status, knowledge about food safety and hygiene practices and the safety measures followed during COVID – 19 Pandemic.

Volume 10 Issue 9, September 2021

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Prior to administration of the schedule the investigator established rapport with the respondents and assurances were given to them on the confidentiality of the data to ensure their co - operation in data collection and to elicit accurate and reliable data from them. A mixed approach i. e. quantitative and qualitative methodologies were adopted to collect the data. Data on food preparation, handling and storage practices were collected by observation and responsive enquiries. The food safety practices related to cleanliness and hygiene of the Food Service Establishment were observed by the investigator and recorded.

3) Creating awareness and education to the Food Service Employees

Food service employees are generally seen to have an average understanding of basic food safety measures. Most of the handlers are not trained in food hygiene and sanitation. Personal hygiene of the food handler plays a vital role in food safety and prevention of food - borne illnesses. Keeping this in view, a booklet was developed to educate the employees on basic food handling techniques. It aimed to improve the quality of the tasks performed by the Food Service Employees.

4) Statistical interpretation of the data

Statistical testes including frequency, percentage, and Pearson rank correlation were used to represent the data. Consolidated data were analysed using SPSS statistic software and Microsoft Excel. The data collected was consolidated and presented as tables, graphs and charts for much clear interpretation of the data.

3. Results

1) Disinfection of the working and service area in the Food Service Establishment, N=50

| Disinfection of the working and service area | Respondents | Percentage |
|--|-------------|------------|
| Every single time after use | 27 | 54 |
| Once in a day | 21 | 42 |
| Once in a week | 2 | 4 |

In the above Table it was observed that nearly 54 per cent of the Food Service Employees disinfect the working and service area every single time after use whereas 42 per cent of the Food Service Employees reported that they disinfect the working and service area only once in a day. Nearly 4 per cent of the Employees disinfect the working and 24 service area once in a week. Sheth *et al.* (2005) reported that 94 per cent of the Food Service Employees disinfect the service area once in a day.

2) Method of washing equipment and utensils in the Food Service Area, N=50

| Methods of washing equipment and utensils | Respondents | Percentage |
|---|-------------|------------|
| Only with Portable water | 4 | 8 |
| Detergent | 7 | 14 |
| Dishwashing liquid | 34 | 68 |

In the Food Service Establishment the utensils were washed with the dishwashing liquid (68%) to get rid of dirt. The still

water in the receptacle was observed to be dirty due to repeated washing of soiled utensils. The Food Service Employees were seen to use a detergent liquid soap to clean the utensils. Reddi *et al.* (2015) observed that 86 per cent of the Food service employees in Hyderabad city washed utensils with water only and 78 per cent used municipal water for the preparation of fruit juices. The use of the same water repeatedly for washing utensils leads to cross contamination from dirty rinse water to cooked food via the rinsed utensils (Mahon *et al.*, 1999).

3) Purchasing pattern of raw ingredients for food preparation, N=50

| Raw Ingredients | Respondent | Percentage |
|---------------------|------------|------------|
| Cereals | | |
| a. Daily | 17 | 34 |
| b. Alternate days | 18 | 36 |
| c. Once a week | 9 | 18 |
| d. Once a fortnight | 6 | 12 |
| Pulses | | |
| a. Daily | 10 | 20 |
| b. Alternate days | 11 | 22 |
| c. Once a week | - | - |
| Once a fortnight | 29 | 58 |
| Vegetables | | |
| a. Daily | 19 | 38 |
| b. Alternate days | 31 | 62 |
| Fruits | | |
| a. Daily | 7 | 14 |
| b. Alternate days | 19 | 38 |
| c. Not Buying | 24 | 48 |
| Milk | | |
| a. Daily once | 40 | 80 |
| b. Twice daily | 10 | 20 |
| Meat | | |
| a. Daily once | 9 | 18 |
| b. Not Buying | 41 | 82 |
| Egg | | |
| a. Daily once | 9 | 18 |
| b. Not Buying | 41 | 82 |

The source and type of ingredients used by the street food vendors and frequency of purchase of these items are crucial factors influencing the quality of cooked foods. All the Food Service Employees reported that they purchased ingredients from the local markets. The details regarding frequency of purchase of raw ingredients are given in the above Table.

It was observed that 34 per cent of the restaurants purchased cereals on a daily basis, while 36 per cent purchased them on alternate days. Only twelve per cent of the Food Service Employees reported the purchase of cereals once a fortnight. Pulses were purchased on a daily basis by 20 per cent and on alternate days by 22 per cent by the Food Service Employees. Vegetables were purchased daily by 38 per cent of the Food Service Employees, while 58 per cent by the alternate days. All Food Service Employees purchased meat and fish daily and milk was procured twice a day by 82 per cent of the subjects while the rest procured it once a day.

Spices were purchased on a weekly basis by 18 per cent and on alternate days by about 36 per cent by the Food Service Establishment. Thus, it was seen that a majority of the Food Service Establishment purchased most of the ingredients on daily basis. Choudhary *et al.* (2011) indicated that 88 per

cent of the Food Service Establishment procured the food grains and semi processed ingredients from the grocery shops at the local markets.

4) Cleanliness, hygiene and safety measures of the outlet

| Category | Rating scale | | |
|---|----------------|-------|----------|
| | Strongly Agree | Agree | Disagree |
| I) Good Hygiene Practices (GHP) | | | |
| [A] Raw material | | | |
| 1. Washing vegetable and fruits before cooking | 37 | 3 | - |
| 2. Vessels, equipment used for cooking should be maintained well to avoid contamination | 13 | 26 | 1 |
| 3. Raw food and cooked food kept separately | 25 | 12 | 3 |
| 4. Cooking table should be free from microbes/dust/dirt | 13 | 25 | 2 |
| [B] STORAGE | | | |
| 5. Storage area free from insects and moisture | 29 | 9 | 2 |
| 6. Cleaning items stored separately | 20 | 18 | 2 |
| 7. Is maintaining your stock list important? | 20 | 18 | 2 |
| 8. Keeping records on the expirer dates of the Products | 15 | 21 | 2 |
| II) CLEANING | | | |
| 9. The chemicals kept out from food | 15 | 18 | 4 |
| 10. Labelling the chemicals important | 19 | 15 | 3 |
| 11. The kitchen is free from pest and rodents. | 25 | 15 | - |
| III) GARBAGE DISPOSAL | | | |
| 12. The garbage bin out from food | 23 | 17 | - |
| 13. The garbage bin kept closed | 23 | 17 | - |
| IV) REHEATING | | | |
| 14. Important to follow precaution activities before reheating the food. | 24 | 14 | 2 |
| V) TRANSPORTATION | | | |
| 15. Important to have transportation vehicle/purchase bags free from insects. | 17 | 23 | - |

Cleanliness, hygiene and safety measures of the outlet were discussed in the above Table. In this table it explains about the Food Safety and Hygiene practices knowledge among the customers from the selected Food Service Establishment. Rating scale was used to study the Food Safety knowledge among the respondents. The rating scale consisted of Strongly Agree (3 points), Agree (2 points) and finally Disagree (1 point).

The respondents were enquired with some of the questions regarding the Good Hygiene Practices such as Raw material, storage, cleanliness, garbage disposal, reheating and transportation in the selected Food Service Establishment. 79 per cent of the respondents Strongly agreed that the Food Service Establishment follows the proper raw material storage, cleanliness, garbage disposal were maintained by the Food Service Establishment.

5) Hygiene Practices by the Food Delivery Personnel, N=10

| Use of sanitizer | Respondent | Percentage |
|---------------------------|------------|------------|
| Before and after delivery | 6 | 60 |
| Once in an hour | 3 | 30 |
| Rare | 1 | 10 |

In the above Table, it was observed that 60 per cent of the Food Delivery Personnel sanitize their hands before and after delivering the food packages to the customers whereas 30 per cent of the Food Delivery Personnel reported that they sanitize their hands once in an hour. 10 per cent of the Employees sanitise their hands rarely. These findings concur with a study by Chandrasekhar *et al.* (2003) in Kerala, where only half of the Food Service Employees used to sanitize their hands before food delivery.

6) Usage of gloves by the selected Food Delivery Personnel, N=10

| Using gloves for delivery | Respondent | Percentage |
|---------------------------|------------|------------|
| Yes | 7 | 70 |
| No | 2 | 20 |
| Maybe | 1 | 10 |

The above Table indicates the usage of gloves by the Food Delivery Personnel. 70 per cent of the respondent reported that they were using the gloves before, during and after delivery of the food packages. 20 per cent of the respondent was not using the gloves during delivery of the food packages.

4. Conclusion

This study evinces a bird’s eye view on the importance of practicing Food Safety and Hygiene protocols by Food handlers at all functional areas of the food service operation, food delivery personnel and as well customers at the service areas to avoid food borne diseases. Ensuring good hygienic practices and adopting Food Safety will certainly ensure the quality of the food prepared and served at the Food Service Operations.

Creating awareness and proper education strategies to the Food handlers, Food Delivery Personnel and customers will prevent contamination and thereby ensure the service of safe and quality foods for the customers. Good lifestyle practices can enhance the quality of health among the generation at all times and especially during this COVID – 19 pandemic.

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