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## Evaluation of food hygiene in commercial food service establishments in Hyderabad

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Naazia Kauser<sup>\*1</sup> and Santoshi Lakshmi N.<sup>2</sup>

<sup>1</sup>Nutrition and Dietetics, Department of Food and Nutrition, OUCW, Koti, Hyderabad, India

<sup>2</sup>Assistant Professor and I/c Head, Department of Food and Nutrition, OUCW, Koti, Hyderabad, India

### \*Correspondence Info:

Naazia Kauser

Nutrition and Dietetics,

Department of Food and Nutrition,

OUCW, Koti, Hyderabad, India

E-mail: [naazia.kauser123@gmail.com](mailto:naazia.kauser123@gmail.com)

### Abstract

Food handlers have a prime role to play in food businesses, and that is to guarantee the meals served are hygienic for consumption. The unhygienic working practices and attitude of the food handlers often play a major role in the food contamination process.

The purpose of this study is to evaluate the level of knowledge, attitude and Food hygiene practices among food handlers in commercial food service outlets in Hyderabad (INDIA). Two hundred food handlers from 20 food service outlets in the vicinity of the University College for Women, Koti were purposively selected for the study. In general the respondent's knowledge was moderate with a percentage mean score of 49.8. A base kitchen hygiene check revealed the poor hygiene practices and their attitude towards safe food handling is also moderate with a mean percentage score of 46.9 and 57.6 respectively. The microbial load of the skin and nail swabs among food handlers has shown a viable count of highly pathogenic bacteria like *E.coli* and *Staphylococcus*.

Periodic Vigilance checks of the outlets by the regulatory authorities, Training sessions and periodic medical checkups of the food personnel by the management are necessary to protect the health of the food handlers and to promote Food safety.

**Keywords:** *E.coli*, public health, food handlers

### 1. Introduction

Food hygiene remains a critical issue with outbreaks of food borne illnesses resulting in substantial costs to individuals, the food industry and the economy. Mishandling of food plays a significant role in the occurrence of food borne illnesses. Improper food handling may be implicated in 97% of all food borne illnesses that are associated with catering outlets.

Several studies [1-5] have documented an increasing lack of knowledge related to personal hygiene, the use of clean utensils and storage of food at the correct temperature. Thus, the changing trend has increased the importance that food be handled in a sanitary manner.

With volume processing and preparation of food, effects of contamination are accentuated if sanitary practices are not followed. Added mechanization and larger volume operations of food processing and preparation have increased the need

for workers in all segments of the food industry to have an understanding of sanitary practices and how hygienic conditions can be attained and maintained.

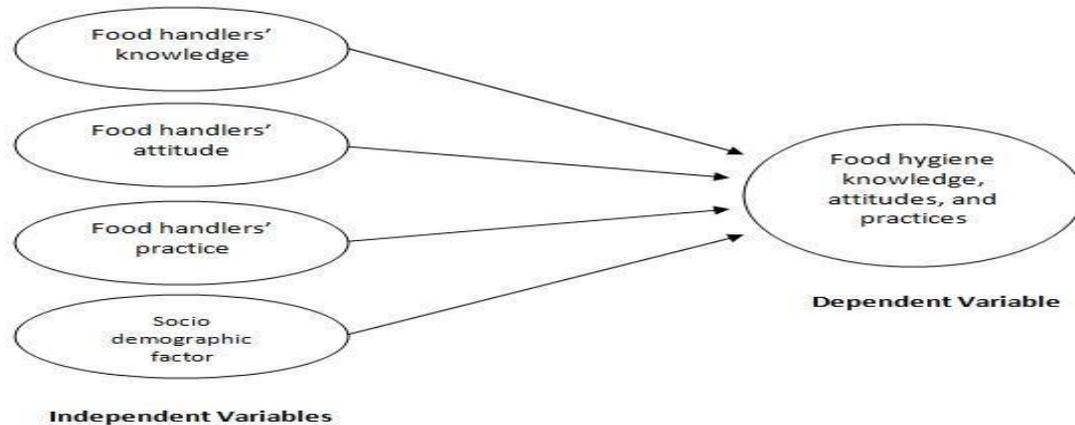
Food safety is responsibility of every person who is involved in food service operation to handle food [6]. Food Handler training is seen as one strategy whereby food safety can be increased, offering long-term benefits to the food industry[7] by providing health education in food and personal hygiene to food handlers and incorporating the same in existing guidelines for food establishments laid down by civic agencies [8].

In recent years, consumer health concerns and awareness in food have become of paramount importance. Food safety and hygiene in the hospitality industry has become an international requirement and vital for all those involved in food handling and preparation [9].

According to FSSAI, Education and Training plays an important role in improving the safety and quality of food. It is essential to acquire the know-how and skills necessary to understand and manage food safety hazards. Both education and training are needed for the purpose. While education

aims at influencing the way of life and empowering people to make a choice, training is a process by which one is able to acquire a skill. Any successful food safety programme will always need a shared responsibility among producers, industry, trade, government and the consumer.

### Relation between Knowledge Attitude and Practice among Food Handlers and the Food Hygiene



Hence in light of the above relationship this study aims to investigate the variation in attitude and to examine the influence of perceived barriers among food handlers behavior toward the practice of safe food handling.

## 2. Materials and Methods

### 2.1 Study Design

A cross sectional study is conducted in commercial food service outlets in close vicinity of University College for Women, Koti Hyderabad.

### 2.2 Study Sample

The current study is carried out from December 2012 and April 2013 in the outlets consented to participate by the Owners to assess the level of knowledge, attitude and Food hygiene practices among food handlers in commercial food service outlets in Hyderabad. Two hundred food handlers from 20 food service outlets were selected by purposive sampling technique for the study up on their consent to participate in the study.

### 2.3 Study Method

During the initial visit consent is taken from the Management of food service establishment to permit their food handlers to participate and co operate for the study and in the next visit the willingness of the food handler to participate in the study is taken. Those who were unwilling to participate were excluded from the study. During the subsequent visits a pretested questionnaire was used to collect the information from the food handlers on their demographic Profile, General Work History, information related to General Personal Hygiene,

Personal Habits and History of the past Morbidity profile and pathological information of urine and stool was used.

Checklist to assess Base Hygiene Check of the Kitchen is used to assess the Premises and Facilities Hygiene, Storage and Temperature control Preparation Housekeeping washing and Drainage system Water carrier system, Facilities to the Food handlers, Pest control. Systemic examination of general Hygiene practices of the Cooks and Assistant cooks participated in the study is done by examining the swabs of Finger nails and the regions of skin between the fingers from both the hands. The sterile moistened Polypropylene swabs were used for this purpose. All the samples were transported to the microbiology lab of the Institute of Preventive Medicine (IPM, Narayanaguda, Hyderabad) and were cultured on Mac-Conkey Agar and sheep Blood Agar media and Incubated for 24 hours and the bacterial species were identified using standard procedures.

## 3. Results and Discussion

The socio demographic characteristics of food handlers has shown that a majority of the food handlers working in the commercial sector in Hyderabad are Men (79%) who are hired as Head Cooks/ Chefs, Assistant cooks, Service boys/ Waiters and only about 21 % are Women mostly involved in cleaning dishes and kitchen area, cleaning groceries in the stores and as helpers in the kitchen. All the subjects are in the age group of 18-38 years and maximum handlers are in the age group of age group of 24 - 28.

From the data it was evident that 84% of the food Handlers work more than 9 hours a day but of them only 45% of them are paid overtime while others are just hired without any regulated amount of working hours a day. Only 28% of the food handlers completed their higher secondary, where as 30% of them are illiterate and is associated with their poor resources and low socio economic profile. From those who were educated 59% of the workers studied up to 7<sup>th</sup> standard and 9% of them completed graduation and are on the second line of services while 28% completed their 10<sup>th</sup> standard/ high school of education.

Being illiterate most of them started working since childhood 39% of them are working since more than 10 years and 36% food handlers were working since 4-7 year. With respect to other provisions apart from their remuneration the Food Establishment management gives food, shelter and dress code, 81% of the food handlers were given Food and Shelter only 78% of them were given proper uniform by the management of which 76% of the food handlers were provided with two pairs of apparels, 6% of them were provided with one pair and 18% were not provided any apparel. Among the food personnel who were given Dress code 46% received the maintenance of their dress code twice a month, 30% every Week. 46% changed and washed their dress once in a month. 47% of the food handlers expressed satisfaction for the remuneration paid by the management.

In fact the educational qualification (Refer Table 1) is one of the most important factors which had impact on the socio economic profile, Knowledge and better hygiene practices of the food handlers. Table 2 gives the findings of the general personal hygiene and appearance of the food handlers working in the food service establishments which confirms that most of the handlers are not paid for the extra hours of work and they are not paid any attention towards their health. The food handles expressed inadequate time for sound sleep and also was not very happy with the remuneration paid. With such insufficient amount they expressed it is difficult to maintain the hygiene standards. The management do not show any interest in getting the food handlers health and medical surveillance checks nor do they impart any training for safe hygiene practices.

One of the elements of the study was microbial analysis of swabs collected from the skin and nails of the food handlers, Table- 3 shows the microbial analysis of Skin swab culture of the food handlers who are employed as cooks and assistant cooks shows presence of potentially pathogenic bacteria, the most expected organisms included

*Staphylococcus*, *Pseudomonas*, *Streptococcus pyrogens*, *E.coli* and *bacillus* harbouring because of unhygienic practices or improper hand washing and improper cooking after the food being handled by these handlers may pose the risk of food borne illness outbreaks.

#### 4. Conclusion

The present study is the outcome of limited research in Hyderabad India related to food Hygiene status in commercial food service establishments Food safety and Standards regulations act which has come into effect from 5<sup>th</sup> Aug 2011 is enforced with an idea to ensure availability of wholesome food for human consumption. This study examined the extent of improvement of food hygiene and the general hygiene of the food handlers and their socio economic status and microbial analysis of skin through nail and skin swab. And the results were found to be alarming in comparison to one of the studies on street vendors in Delhi (INDIA) where there is a marked increase in the hygiene practices adapted by the street food vendors[10]. Hence there is an urgent need for the government to take necessary steps in initiating the Five Keys to Safe Food as suggested by the World Health Organization [11].

Key 1: Keep clean

Key 2: Raw and cooked food should be kept separated

Key 3: Destroy hazards when possible

Key 4: Keep microorganism in food from growing

Key 5: Use safe water and raw material.

The basic requirement of environmental hygiene in the preparation area is essential, which can be achieved by proper training and knowledge of Food personnel on safe food handling practices. And all the food businesses should be directed to operate only after registering to be the part of safe food zone umbrella. The food outlets have to be thoroughly checked for the fulfilment of the prerequisites by the food safety authority of India before licensing which should be Mandatory.

#### 5. Recommendations

From the above observations it can be concluded that the management and the staff needs orientation programs to improve with the practices and handling procedures in the food service establishments. The food safety and standards regulation (Licensing and registration of food businesses), 2011 made by Food safety and standards Authority of India though being implemented from 5<sup>th</sup> August 2011 in the interest of Food Business operators and Consumers ensuring food safety and

Hygiene, it has become all more difficult because of high prices lashing in current scenario. It is still remained practice that the food business owners cut down activities that are extremely essential for Food safety, viz. regular pest control, regular health check for the Food handlers, provision of soap solution for hand washing and cleaning mechanism etc. Though these are simple and inexpensive measures of hygiene, they are often ignored and neglected by the Food vendors. In this context it is recommended that

the Food safety and standards Authority should take the challenge of implementation of its regulation to ensure the objective of whole some food to the consumers by recruiting good number of Food safety officers who should be strictly vigilant to implement the food safety and standards act. It is all difficult to bring in the change in attitudes and practices of the food handlers without the above said prerequisites in place.

**Table-1: Education profile of the Food handlers**

| Education status   | % of Cooks   | % of Helpers | % of Waiters | % of House Keepers |
|--------------------|--------------|--------------|--------------|--------------------|
| Illiterate         | 30.5<br>(11) | 34.7<br>(24) | 25.5<br>(12) | 41.7<br>(20)       |
| up to 7th standard | 27.8<br>(10) | 33.3<br>(23) | 32.0<br>(15) | 23.0<br>(11)       |
| High school        | 25.0<br>(9)  | 24.6<br>(17) | 32.0<br>(15) | 31.3<br>(15)       |
| Above high school  | 16.7<br>(6)  | 7.2<br>(5)   | 10.6<br>(5)  | 4.2<br>(2)         |

**Table- 2: Physical examination of the Food Handlers for their general hygiene and Appearance**

| Physical Examination | Appearance                             | No  | %    |
|----------------------|--|-----|------|
| General hygiene      | Fair                                   | 55  | 27.5 |
|                      | Good                                   | 16  | 8    |
|                      | Poor                                   | 96  | 48   |
| Hair                 | Clean, Well Trimmed                    | 64  | 32   |
|                      | Clean, Untrimmed                       | 78  | 39   |
|                      | Unclean, Untrimmed                     | 58  | 29   |
| Nails                | Clean, Trimmed                         | 127 | 63.5 |
|                      | Trimmed, Dirty                         | 58  | 29   |
|                      | Dirty, Untrimmed                       | 37  | 18.5 |
| Hands                | Clean, No injuries                     | 123 | 61.5 |
|                      | Dirty, No injuries                     | 67  | 33.5 |
|                      | Dirty, open injuries                   | 10  | 5    |
| Exposed Skin         | Clean, Healthy                         | 168 | 84   |
|                      | Boils cuts wounds, Uncovered           | 24  | 12   |
|                      | Wounds, Boils Infected                 | 8   | 4    |
| Eyes                 | Healthy and clean                      | 193 | 96.5 |
|                      | Infected but no purulent discharge     | 5   | 2.5  |
|                      | Infected with purulent Discharge       | 2   | 1    |
| Ears                 | Healthy and clean                      | 83  | 41.5 |
|                      | Unclean, but no purulent discharge     | 107 | 53.5 |
|                      | Infected with purulent Discharge       | 10  | 5    |
| Uniform              | Clean well ironed, separate dress code | 32  | 16   |
|                      | clean, no Dress code                   | 86  | 43   |
|                      | Dirty                                  | 82  | 41   |
| Shoes / boots        | Clean , Tidy                           | 13  | 6.5  |
|                      | Dirty                                  | 13  | 6.5  |
|                      | No Shoes                               | 174 | 87   |

**Table- 3: Number of food Handlers (n=36 Cooks and Assistant cooks) Showing positive to the Skin and Nail swab culture**

| Grams Nature         | <i>Staphylococcus</i> |           | Gram -ve Bacilli |           | <i>Streptococcus</i> |           |
|----------------------|-----------------------|-----------|------------------|-----------|----------------------|-----------|
|                      | Skin swab             | Nail Swab | Skin swab        | Nail Swab | Skin swab            | Nail Swab |
| Indole Test          | 0                     | 0         | 0                | 0         | 0                    | 0         |
| Methyl red Test      | 28                    | 18        | 32               | 25        | 26                   | 16        |
| Voges-Proskauer Test | 0                     | 0         | 02               | 0         | 0                    | 3         |
| Citrate Test         | 0                     | 0         | 17               | 14        | 0                    | 0         |

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