

A Study of Food Handlers in Public Food Establishments in Maharashtra, India

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Abstract: ***Objectives:** To study socio-demographic profile, health status and level of hygiene in food handlers. **Methods:** The present cross sectional study was carried out among 70 food handlers working in public food establishments in Miraj. The food establishments were selected by a randomized sampling technique. From each hotel 5 participants were selected randomly. The handlers were assessed for their socio-demographic profile using a questionnaire interview method. General examination was done on the participant to assess the health status. **Results:** It was found that majority of food handlers in the age group of 15-30 years (68%), Male (79%), Hindus (92%). 90% of the food handlers had education level of less than 10th standard or were illiterate. 20% of the food handlers reported some form of infection or disease. **Conclusion:** The study showed that majority of food handlers were from within the state (80%) and predominantly males of the productive age group. Since there were low education levels among the handlers there is a probability that they have poor knowledge of food safety measures. The study showed that the most common diseases among the food handlers were respiratory illnesses.*

Keywords: Food Handlers, Hygiene, Food safety, Health status, Public food establishments.

1. Introduction

Food is the basic human need for survival; necessary for growth and maintenance of life. The health of people depends largely on the food they eat. Food can be responsible for ill-health either due to failure to consume enough of nutrients or consuming contaminated food.

The extrinsic contamination of food may occur at any point in its journey from the producer to the consumer. Food handlers specially play a major role here. Epidemiological and surveillance data suggest that faulty practices in food processing plants, food service establishments and home play a crucial role in the causal chain of food-borne diseases. The chances of food being contaminated depend largely on the health status of food handlers, their hygiene, their knowledge, attitude and practices. Food handlers can transmit a variety of diseases. This has been most famously demonstrated by the notorious case of "Typhoid Mary", a food handler who was also a chronic carrier of Typhoid. In the early years of the 20th century the unfortunate combination of her medical condition and her chosen profession, a cook, is estimated to have resulted in about 1300 cases of typhoid fever in the USA [1], [2].

The risk of spread of disease through food handlers though grave has been neglected. The WHO book *Foodborne Diseases: A Focus For Health Education* underlines the importance of the education of consumers and food handlers, both domestic and professional, in food safety [3]. The contamination of food can be avoided only if the food handlers are in good health and free from infection.

With this view, the present study was planned with an aim to know the current scenario regarding food Handlers in public food establishments in this region of India. The objectives

were to study the socio-demographic profile of food handlers and to study their hygiene level and health status.

2. Problem Definition

Current statistics on food borne illnesses in various industrialized countries show that up to 60% of cases may be caused by poor food handling techniques, and by contaminated food served in food service establishments. In 1989 it was estimated that the total cost of bacterial food borne illness to the United States economy was US\$ 6,777,000,000. Hence it is a burden on economy also. In developing countries, the effect on economic activity and development can only be far more severe [1].

3. Methodology

The present study was carried out in the public food establishments (hotels) situated in Miraj in District Sangli, Maharashtra, India. This city is near border of Karnataka and is a medical hub. Hence many patients come for treatment here and to cater their needs a blooming hotel industry is present in this city.

The present study is a descriptive cross-sectional study. It is based on the primary data obtained from the food handlers through questionnaire based interview method and General examination. The questionnaire was pre-tested and semi-structured. The total study period of the present study was about four months, from May 2010 to August 2010.

The study population consisted of food handlers working in small and medium sized food establishments. A Public food establishment is a hotel/ restaurant/ food outlet/ food establishments barring street food. The food handler was defined as any person who is involved in cooking or in the process of serving food.

The calculated sample size with $p=50\%$ and $L=20\%$ was 25. The study was planned on 75 food handlers with Multistage Random sampling. Miraj city in total has 236 food establishments. Out of these, a total of 25 hotels were selected for the study on the basis of a systematic random sampling method. The selected establishments were visited during the non working hours of the food handlers for the purpose of obtaining data. Minimum 5 (or all when the number of food handlers is less than 5) food handlers from each of these establishments were randomly selected to obtain the total sample of 75 food handlers. The purpose of study was explained to each of them and their informed consent was taken before administering the questionnaire based interview in vernacular language.

The questionnaire contained sections on General socio-demographic information, personal hygiene, and current health status. An arbitrary weighted scoring system was designed for the evaluation of personal hygiene of food handlers. It had total 9 points like hair, condition of Hair, Shave, Hands, Nails, Cloths, Habit of spitting, Bathing and Covering mouth while coughing and sneezing etc. The maximum number of points that can be obtained by any respondent were 13. The bias between scoring for males and females was eliminated by giving an additional point to unrelated responses (eg. For shave in case of women an additional point was given to women). Detailed History taking and Clinical examination was carried out and symptoms suggestive of any infectious diseases were specifically noted.

All the study participants were given health education and hand outs regarding the "Golden rules of Food Safety" by W.H.O. after the data collection was over.

4. Results

Majority of the food handlers in the business were Hindu (92%) in the age group of 15-30 years (68%), as shown in Table no 1. The male: female proportion was found to be 3.69:1. The mean age of males was 27.88 ± 9.72 years and the mean age of females was 45.86 ± 11.99 years. 80% of the food handlers were from within the state. The respondents from outside Maharashtra were from different parts of India. All the female respondents came from within the city. Nearly 90% of the food handlers had education $<10^{\text{th}}$ or were illiterate. Out of all the respondents surveyed one respondent had completed a hoteling related course. Majority of them belonged to lower middle socio economic class according to the B.G. Prasad classification.

Table 1: Socio-demographic profile of Study group

Parameters	Total (n = 75)	%	
Age (Yrs)	15-30	51	68.00
	31-45	11	14.66
	46-60	11	14.66
	61 and above	02	02.66
Sex	Male	59	78.66
	Female	16	21.33
Religion	Hindu	69	92.00
	Muslim	5	06.66
	Christian	1	01.33
Education	Illiterate	17	22.66
	Till SSC (10 th)	50	66.66
	Till HSC (12 th)	6	08.00
	Till Degree	2	02.66
State of origin	Maharashtra	60	80.00
	Others	15	20.00

Around 50% of the food handlers were involved in serving the food while just 13% were doing coking as well as serving. Majority of food handlers (68%) had work experience of 1 to 10 years as indicated by the table no. 2.

Table 2: Work profile of Food Handlers

Parameters	Total (n = 75)	%	
Nature of work	Cooking only	29	38.66
	Serving only	36	48.00
	Both	10	13.33
Work experience	≤ 1 yrs	7	9.33
	> 1 yr to 5 Yrs	29	38.66
	> 5 yrs to 10 yrs	22	29.33
	> 10 Yrs	17	22.66

Table 3: Habits and Addictions in Food Handlers

Addictions/ Habits	Total (n=75)	%
Chewing Tobacco	19	25.33
Chewing Betel nut	3	4.00
Consuming Alcohol	10	13.33
Smoking	8	10.66
None	46	61.33

* Multiple answers

29(38.6%) Food handlers had one or more addiction/habit. As a whole, 26 (44.07%) of the males had some form of habit or addiction. Only 3 (18.75%) female respondents had habits or addictions. 2 participants (2.66%) had all four habits while 20 (26.66%) had both - Habit of chewing Tobacco and betel nut.

The figure 1 shows the hygiene score as Poor (1-3), Needs Improvements (4-7), Acceptable (8-10) and Good (11-13). Mean hygiene score was 9.27 ± 2.06 . 82.66% had Acceptable or Good Hygiene level. Those who had scores <8 were mainly male food handlers.

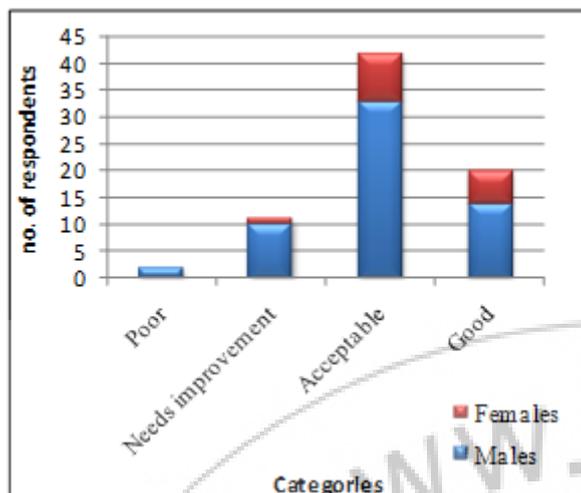


Figure 1: Hygiene Score of the Food Handlers

None of the food handlers surveyed had undergone any form of medical Examination at any time during his career. On the day of data collection 15 (20%) of the food handlers mentioned having symptoms suggestive of some current disease or infection. The most common current symptom mentioned by them was cough present in 50% of respondents with symptoms. The following table no. 4 gives the split of diseases among the symptomatic respondents.

Table 4: Type of symptom present in symptomatic study participants (n=15)

Current Symptom	Total (n=15)	%
Cough	8	50.00
Diarrhea	2	12.50
Runny Nose	1	6.25
Fever	1	6.25
Sore throat	1	6.25
Skin lesions	2	12.50

5. Discussion

The limited research related to food safety, hygiene and health of food handlers and food handling practices in food businesses indicates that food-handling problems need to be addressed. Ehiri and Morris pointed out that data on risk factors for food borne diseases imply that most outbreaks result from improper food handling practices [4]. A study by Howes et al in USA suggested that improper food handling practices contributed to approximately 97% of food borne illnesses in food-service establishments and homes [5]. The food handlers play an important role in the spread of food borne disease. The incidence of food borne diseases can be greatly reduced if the food handlers follow good practices and maintain a good level of personal hygiene. Besides a good level of education and knowledge in food handling and cooking practices is essential for food safety. In our country with increasing number of people eating outside it has become necessary to evaluate the level of food safety and to evaluate the role of food handlers in the spread of food borne diseases.

In present study it is evident that the young males from 15 to 30 years of age form the largest group of food handlers (81%). The females on the other hand were from the older

age group majority of them being from age group of 46-60 years (43.7%). A study in Bangkok indicated that majority of the food handlers were from the age group of 31-45 [6]. This indicates a younger work force in India. The study of food handlers by Musa and Akande showed that 98% of the food vendors were women [7], but the present study has 78.66% of food handlers as males. This indicates that in India food processing in public eating places is predominantly an occupation of the males. After 60 years of age very few remain in this industry.

Nearly 25% of males were from Outside Maharashtra state and out of 44 males who were from Maharashtra itself, 10 (22.72 %) were from outside region. That is, a total of 25 (33.33%) couldn't visit their families very often. A total of 34 (57.62%) males were staying away from their families either with male room partners (8.48%) or in hotel premises itself with others (49.15%). This made all of them prone for high risk sexual behavior and vulnerable for the various sexually transmitted diseases. While no female worked outside her city premises, indicating the limited mobility allowed in our society for them. All of them stayed with their families.

The respondents fared poorly on the level of education. Around 90% of food handlers had education level of less than or equal to 10th standard. Almost 90% of the female respondents were illiterate. One can also say that for illiterate females being in food industry is an easier task where cooking skills are needed more. It is obvious that lack or paucity of education made them unaware of food safety guidelines. Consequently they could be perceived to be a potential risk to food safety due to their low educational background and hence, may have little or no understanding of the risks of microbial or chemical contamination of food or how to avoid them. Besides, only one respondent had done a hoteling related course, this shows that the food handlers would not be aware of the practices to be followed during the processing of food.

29 (38.66%) study participants reported having one or more addictions. Smoke or smokeless tobacco was found to be the most common addiction, which leads to poor oral hygiene and ultimately to oral and lung cancers. It can also leads to repeated infections.

Out of all the respondents most of them worked either as cooks/assisted cooking or were involved in serving. Very few of them (13.33%) had to undertake both the modalities together. But this indicates that there is always a possibility that as per the needs the work position of a person could be changed. So while training, one has to train all food handlers regarding the food safety measures as extra precaution.

Most of the respondents (68%) were well experienced with 1-10 years experience. A study conducted in Turkey by Murat Bas et al shows that 36% of food handlers had experience in the range of 1 to 5 years, thus showing similar findings [8]. The experience of the individual though quite good would not be useful unless they had good knowledge of food handling. The negligent practices of the food handlers would continue unless they are given some form of

training in food handling. Similarly old habits die hard. So if one wants to change the situation, hands on training for new recruits regarding food safety would prove to be useful.

None of the food handlers surveyed had undergone any form of medical examination. This is contradictory to other studies in the past where most of the respondents had undergone some form of medical examination. A study by Maizun Mohd Zain and Nyi Nyi Naing in Malaysia showed that 61.9% had undergone routine medical examinations [9]. A study by Musa and Akande showed that 76.2% respondents had medical examination done before commencing food vending activities [7]. In India though food borne diseases are prevalent none of the food handlers had undergone a medical examination of any form. A medical examination should be mandatory before commencing and food handling activity. This factor thus poses a major risk to the spread of food borne diseases.

The personal hygiene of the food handlers is a major factor that can directly contribute to food borne illnesses. A study by Murat B et al. showed that knowledge of personal hygiene scores were poor (31.8%). It was observed that good personal hygiene was often practiced among the highly educated workers (77.7%) [8]. The present study showed that a majority of the food handlers had the 'need improvement' or 'acceptable' levels of personal hygiene. A few males had a poor personal hygiene level out of all the food handlers. Both the males who had a poor hygiene level had not even completed primary education. Thus the poor hygiene can be attributed to their poor educational level and lack of training. Out of the 42 food handlers who had an acceptable level of personal hygiene 30 (71.42%) of them had education level ranging upto 10th standard, This shows that the level of education co-relates with the level of personal hygiene. And hence a good level of education or formal training before commencing food handling activity is a must. 20 (26.66%) of the food handlers had unkempt dirty nails, 24 (32.00%) of them had uncut nails but appeared clean. So a total of 58.66% of the food handlers had uncut nails. This can prove to be a major factor that affects food safety. A study by Musa and Akande in Nigeria showed that around 45% of the food vendors did not have well kept finger nails [7]. The habit of spitting is commonly observed in tobacco and betel nut consumers. 18 (24%) of the food handlers reported the habit of spitting. 17 (94.44%) out of the 18 food handlers reported the habit of chewing tobacco or betel nut. The habit of spitting can also cause a contamination due to droplets of saliva that may contaminate the food. Also majority of the respondents did not cover their mouth while sneezing; this is another mode of spread of pathogens by droplet infection. On an average the female food handlers had better personal hygiene score as compared to males. Hence, the personal hygiene level of food handlers has lot of scope for improvement.

15 (20%) of the food handlers mentioned of having some form of disease or infection. Out of these maximum of them i.e. 50% mentioned of having cough; followed by 12.5% had diarrhea and 12.5% had skin lesions. In India the regulations for sick leave are also not followed and hence the food handlers avoid taking a leave from work during sickness.

The study in Delhi indicated that most of the participants (94.7%) had one or more morbid conditions, important ones being dental caries (50.3%), worm infestation (41.1%) and injuries/burns on hands (39.7%) [10]. The health seeking behavior, immunization status in relation to enteric group of fevers and tetanus and pre-placement and in-service medical examination were observed to be unsatisfactory in the study. The study in Amritsar indicated that 62% of participants showed evidence of some disease or deficiency while 14% of them had intestinal parasitic infestations [11]. The study in Bijapur showed that among 332 respondents, 124 were healthy. The remaining 208 (62.65%) respondents had one or more than one health problem. Of these health problems, anaemia (29%), orodental disease (20%), gastroenteritis (12.6%), and febrile illness (11.33%) were the major morbidities. Parasitic infestation was found in 22 (9.7%) of the 225 stool samples examined [2]. For the purpose of examination of the health status a separate and more detailed study would be required which would aim at assessing only the health status of the individual by carrying out various investigations.

6. Conclusion

The problem areas that are identified in current study are Need of improvement in personal hygiene of food handlers, Need for Pre-placement medical checkups and trainings in food safety measures.

7. Future Scope

The results of present study help to generate the profile of food handlers and gives baseline information to plan the corrective measures. Pre-placement and then regular medical checkups of the food handlers should be carried out to improve food safety. The majority of food handlers being male migrants, their awareness regarding the risk of sexually transmitted diseases and safer sex practices should increased by targeted approach in health education.

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References

- [1] Adams M, Motarjemi Y. Basic food safety for health workers. WHO, Geneva, 1999 available at: http://whqlibdoc.who.int/HQ/1999/WHO_SDE_PHE_F_OS_99.1.pdf [Assessed: 25th June 2014]
- [2] Udigiri R., Yadavnavar M. C.: Knowledge and food handling practices among food handlers employed in food establishments in Bijapur city. IJPH Vol 50 (4), 2006; 240-241.
- [3] World Health Organization. Food-borne Disease: A Focus for Health Education. World Health Organization, Geneva, 2001.
- [4] Ehiri, J. E., & Morris, G. P.: Hygiene training and education of food handlers: Does it work? Ecology of Food and Nutrition, 35(4) 1996, 243–251.

- [5] Howes, M., McEwen, S., Griffiths, M., & Harris, L.: Food handler certification by home study: Measuring changes in knowledge and behavior. Dairy Food and Environmental Sanitation, 16(7), 1996, 737-744.
- [6] Suthida Chongpiyawarang: Knowledge attitude and practices of food handlers and food sanitary condition in bus terminal at Bangkok mass transit authority bus zone 7; Thesis submitted Mahidol university, 2004
- [7] Musa OI, Akande TM: Food hygiene practices of food vendors in secondary schools in Ilorin. Niger Postgrad Med J, 2003 Sep; 10 (3):192-6.
- [8] Murat Bas, Azmi Safak Ersun, Go'khan Kivanc.: The evaluation of food hygiene knowledge, attitudes, and practices of food handlers' in food businesses in Turkey; Food control 17, 317-322, 2006.
- [9] Maizun Mohd Zain, Nyi Nyi Naing: Sociodemographic characteristics of food handlers and their knowledge, attitude and practice towards food sanitation: a preliminary report. Southeast Asian J Trop Med Public Health, Vol 33, No. 2, June 2002: 410-17.
- [10] Malhotra R, Lal P, Krishna Prakash S, Daga MK, Kishore J: Profile of food handlers working in food service establishments located within the premises of a medical college in Delhi, India; Public Health, 2007 June; 121(6): 455-61.
- [11] V. Mohan, U. Mohan, Lakshman Dass, Manohar Lal: An Evaluation of Health Status of Food Handlers of Eating Establishments in Various Educational and Health Institutions in Amritsar City; IJCM. 2001 XXVI(2): 80-5

Author Profile



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