



A Study on Food Handlers' Knowledge and Practices of Personal Hygiene during Kumbh Mela, 2015-16 at Nashik, India

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ABSTRACT

Introduction- This study was conducted in the 'Kumbh Mela' at Nashik where the 'Annachatras' of 'Sadhugram' cater food demands of large number of inmates and devotees. This increased the need for maintenance of food and personal hygiene of the food handlers. Hence it was decided to assess knowledge and practices regarding personal hygiene of food handlers.

Methods- Observational study of 62 food handlers, with structured pre-designed proforma was undertaken. Study was carried out among 3 Akhaadas of Nashik during Sept-Dec 2015. After informed consent from participants, information on socio-demographic data, knowledge and practices about food and personal hygiene was obtained. A general physical examination to assess personal hygiene was also undertaken.

Results- Most of the food handlers (85.5%) had heard and 83.9% had knowledge of transmission of diseases by food. There was less use of gloves (19.4%); hair cover (17.7%) and face mask (14.5%). There was acceptable level of personal hygiene mainly clean hairs (95.2%), clean cut nails (83.8%) and clean hands (88.7%). There was no association of education with knowledge, practice or level of personal hygiene.

Conclusion- The study revealed that most of food handlers had knowledge of food borne diseases and observed personal hygiene.

Key words: Food Handler, Personal Hygiene, Kumbha Mela, Food borne disease

INTRODUCTION

India is a country of culture and rituals. Throughout the year, many religious gatherings take place all over the country. "Kumbh Mela" is one of the auspicious Hindu religious gatherings which happens once in 12 years and lasts for one year. These are held at four main locations namely Allahabad, Nashik, Ujjain and Haridwar.¹ The Kumbh Mela witnesses the influx of lakhs of devotees and sadhus from all over India into the above four locations. They reside in a major temporary township called 'Sadhugram'. Within the Sadhugram, there are individual temporary settlements called 'Akhaadas' representing prominent sadhu leaders and their followers.² Food provision is made by various 'Annachatras' in the Akhaadas as well as by individual handcarts, hotels and stalls (Tapris). Large

numbers of food handlers are involved in food preparation in these Akhaadas. These types of mass gatherings increase vulnerability to outbreaks of various infectious diseases, particularly food borne diseases.³

The present study was conducted in the backdrop of the KumbhMela2015-16, in Nashik, Maharashtra from September2015to December 2015. Sadhugrams were set up in the 'Tapovan' (Panchavati) and 'Trimbakeshwar' areas in Nashik. These comprised of Akhaadas (a religious unit of sadhus headed by a Mahant or Chief). There were 13 Akhaadas in total as well as individual sadhus, in lakhs. These Akhaadas have numerous food handlers who look after the food preparation in these Annachatras.

Food contamination can occur at any point in its journey from the producer to the consumer.^{4,5} Food handlers are the most important sources for the transfer of micro-organisms to the food from their skin, nose, axilla, perineum, and throat during preparation and serving such food.^{6,7} Hence they play an important role in ensuring food safety throughout the chain of production, processing, storage, preparation and serving of food. The chances of food being contaminated depend largely on the health status of food handlers, their hygiene, their knowledge, attitudes and practices.⁸ This is especially important in the backdrop of the Kumbh Mela where the number of food consumers runs into lakhs per day and there is volume preparation and processing of food due to which the risk of food-borne disease outbreaks is very high.

Infections can be acquired through poor personal hygiene practices of food handlers such as not washing hands after defecation/urination, licking of fingers, not covering the nose & mouth while sneezing, not using gloves and hair covers and so on. Often these food handlers are appointed without proper pre-placement examination. Therefore a high standard of personal hygiene among the food handlers is needed. Both education and training are needed for this purpose. The WHO book '*Food-borne Diseases: A focus for Health Education*' underlines the importance of the education of consumers and food handlers, both domestic and professional in food safety.⁹ The present research was planned with the goal to find out the knowledge and practices for personal hygiene of food handlers during Kumbh Mela gathering which will help to identify gaps in education and training of them regarding food hygiene and safety.

AIMS AND OBJECTIVES

The study was conducted to assess knowledge and practices regarding personal hygiene of food handlers in the study area. The study assessed their knowledge in areas of food borne diseases and the relationship between education level of food handlers and their knowledge, practices and personal hygiene regarding food borne diseases. It also assessed their level of personal hygiene.

MATERIAL AND METHODS

The present study was a descriptive study based on the primary data obtained from the food handlers in Kumbh Mela, Nashik. Three Akhaadas were randomly selected in the Tapovan (two akhaadas) and Trimbakeshwar (one akhaada) areas of Nashik during Kumbh Mela 2015-16. The study

was held during September-December 2015 (4 months). Among a total 3 Akhaadas, there were approximately 80 food handlers were available and out of these 62 participants who agreed to participate in the study were included. For the present study, Food handler was defined as any person who handles/comes in contact with raw or prepared food, involved in the preparation and/or serving of food.

The written informed consent was obtained from each food handler, after explaining the purpose of the study. Clearance was obtained from the Institutional Ethics Committee before starting the study. In addition, permission was taken from the Heads of the 3 Akhaadas for interviewing the food handlers. A convenient time of interview was decided in the non-working hours so that the work schedule of the food handlers was not hampered. Those not willing to participate in the study were excluded.

Data was collected on a pre-designed proforma by face-to-face interview technique in vernacular language. The proforma contained sections on socio-demographic information, general work history and information on knowledge of food-borne diseases, food hygiene, personal hygiene, current health status, past morbidity. A scoring system was designed to evaluate association between education and knowledge, education and practice, education and level of personal hygiene. For evaluation of association between education and knowledge, a score more than 5 out of 10 was considered satisfactory. Similarly, association between education and practices was evaluated and a score more than 7 out of 14 was considered satisfactory. Observational checklist was used to assess the existing hygiene of the food handlers and a score more than 3 out of 7 was considered satisfactory. At the end of the interview, health education regarding food and personal hygiene was imparted to all the study participants.

All food handlers working at 3 Akhaadas in the Sadhugrams at Tapovan and Trimbakeshwar, Nashik who were ready to give informed consent were included in this study. Persons not willing to participate in the study and children below 14 years of age were excluded from this study.

Analysis of the data was carried out using SPSS 18.0 version and chi-square test was used for statistical significance.

RESULTS

Total 62 food handlers consented to participate in this study and were interviewed at the three Akhaadas of the Sadhugram at Tapovan and Trimbakeshwar, Nashik.

Table 1: Distribution according to socio-demographic variables (n=62)

Variables	Individual (%)
Age (Years)	
15-25	15 (24.2)
26-35	15 (24.2)
36-45	14 (22.6)
46-55	06 (9.7)
Above 55	12 (19.3)
Gender	
Male	57 (91.9)
Female	05 (8.1)
Educational status	
Illiterate	09 (14.5)
Primary	10 (16.1)
Middle School	09 (14.5)
Secondary	17 (27.4)
Higher secondary	11 (17.7)
Graduate	06 (9.7)
State of origin	
Maharashtra	07 (11.3)
Others	55 (88.7)

Table 2: Morbidity profile of food handlers (n=62):

Morbidity	freq. (%)
GIT disorders	19 (30.6)
Respiratory tract infections	12 (19.4)
Discharge from ears/ eyes/ gums/ mouth	06 (9.7)
Skin lesions	03 (4.8)
No morbidity	22 (35.5)

Table 3: Assessment of knowledge about food borne diseases and personal hygiene among food handlers (n=62):

Knowledge	Freq. (%)
Have you ever heard of food borne diseases?	
Yes	53 (85.5)
No	9 (14.5)
Have you heard about diseases being transmitted by food handlers?	
Yes	52 (83.9)
No	10 (16.1)
What is your source of information?*	
Mass media	40 (64.5)
Health Professionals	15 (24.2)
Written display	14 (22.6)
Formal training	1 (1.6)
Others	19 (30.6)
How can food borne diseases be transmitted?	
Contaminated foods	54 (87.1)
Contaminated hands	51 (82.3)
Contaminated water	52 (83.9)
Vectors: Houseflies/ Cockroaches	38 (61.3)
Don't know	6 (9.7)
Can you name at least one disease transmitted due to lack of personal hygiene?	
Yes	38 (61.3)
No	24 (38.7)

* indicates multiple response

Distribution of respondents showed that (Table 1), majority (91.9%) of the food handlers were males. Among 62 study subjects, maximum 44 (71.0%) were in the 15-45 years age group. 55 (88.07%) of the study subjects were from outside Maharashtra. It was observed that there were children below the age of 14 years also working in these Annachatras (excluded in study group).

It was observed that among the food handlers, 9 (14.51%) were illiterate, whereas only 6 (9.67%) were graduates. None of the participants received any specific training related to food industry. 54 workers were salaried whereas 8 were doing 'Seva' (voluntary work). Some workers were additionally provided with food, shelter and medical aid.

40 out of 62 (64.5%) food handlers were suffering from various diseases (Table 2) at the time of interview. The most common morbidity was Gastro-intestinal tract (GIT) infections (19; 30.6%) and least common was skin lesions 3 (4.8%).

It was observed that 53 (85.5%) food handlers had heard about food borne diseases, 52 (83.9%) knew about their transmission by food handlers, 56 (90.3%) were aware about one or more modes of transmission and 38 (61.3%) could name at least one disease transmitted due to lack of personal hygiene (Table 3). The major source of information was through Mass Media 40 (64.5%).

Satisfactory level of personal hygiene practices (Table 4) was observed as regards with hand washing, regular bathing, and trimming of hair and nails. Most of them considered fingering the nose and licking fingers while handling food as harmful and unhygienic. However the practices regarding use of gloves, caps/hair covers and covering for the nose and mouth while handling food were unsatisfactory.

On general examination of the food handlers (Table 5), it was observed that 59 (95.16%) had trimmed hair, 52 (83.87%) had clean and cut nails and 55 (88.7%) had clean hands. It was also observed that 53 (85.48%) were not using gloves, 61 (98.38%) were not using aprons and 53 (85.48%) were not using any form of hair cover.

Education levels were clubbed into 3 groups (Table 6), first group comprising of education levels up to primary school, second group up to secondary school and third group of above secondary school. By applying cut-offs of 5 (out of a total score of 10), score of satisfactory level of knowledge was calculated. By applying cut-offs of 7 (out of a total score of 14), score of satisfactory level of practice was calculated. By applying cut-offs of 3, score of satisfactory levels of observed hygienic practices was calculated.

Table 4: Assessment of practices among food handlers (n=62):

Practices	No. (%)
Wash hands with soap & water before & after defecation	53 (85.48)
Wash hands with soap & water before & after urination	54 (87.09)
Wash hands before handling food	54 (87.09)
Wash hands before serving food	52 (83.87)
Minimum handling of food	44 (70.96)
Use of gloves while handling food	12 (19.35)
Wearing a cap to cover the hair	11 (17.74)
Covering your mouth & nose	9 (14.51)
Wearing clean clothes/overalls at all times	45 (72.58)
Habit of fingering nose	1 (1.61)
Have habit of licking fingers	3 (4.83)
Regular trimming of hair	41 (66.12)
Regular cutting of nails	55 (88.70)
Regular bathing	59 (95.16)

Table 5: Assessment of personal hygiene among food handlers (n=62):

Observation	No. (%)
Overgrown / unclean hair	3 (4.83)
Uncut/unclean nails	10 (16.12)
Unclean hands	7 (11.29)
Presence of Skin disorder	3 (4.83)
Use of gloves	9 (14.51)
Use of apron	1 (1.61)
Use of cap	9 (14.51)

There was no association (statistically insignificant difference) between education and knowledge score, education and practice score as well as between education and hygiene assessment score among these groups.

33 (53.2%) workers were free from any addictions. The remaining 29 (46.8%) had one or more addictions. The addictions observed were use of Gutkha, tobacco chewing, smoking, alcohol and drug addiction (Ganja). 3 food handlers had more than one addiction.

The work profile showed that 67.7% food handlers were involved in food preparation, 41.9% in serving the prepared food and 8.1% in cleaning/housekeeping. Only 5 (8.1%) had formal training in basic hygiene. Only 7 (11.3%) persons had undergone pre-placement examination. Sickness

benefit in the form of cash for treatment was given to 14 (22.6%) workers.

DISCUSSION

The present study was conducted in the 'Kumbh Mela' of Nashik, Maharashtra during July- October 2015. The food handlers in the various 'Akhaadas' cater to the food demands of large number of inmates and devotees. Hence large volume of food was prepared on a daily basis which increases the need for maintenance of food hygiene and personal hygiene of the food handlers as they could be a focus for food borne diseases. There are very few Indian studies^{10,11,12} conducted on survey of the food handlers but none of them was held on Kumbh Mela like occasions.

Socio-demographic profile of the study population revealed that majority of the food handlers were males 57 (91.9%) and most of them (71.0%) belonged to the young age group of 15-45 years. Similarly, Anant Takalkar et al¹⁰ and Dr. Prabhu et al¹³ reported that the most of food handlers belonged to 15-45 years age group (71.1% & 82.7%) respectively but they had much larger number of females (38.6% & 21.3%) in their study groups. This could be due to the migratory nature of our study group labour since most of them were from outside Maharashtra state and hailed from UP, MP and Rajasthan). A few (3.2%) children (below 14 years age) were also seen working in these Akhaadas. But they were not included in the study group. Anant Takalkar et al¹⁰ stated that there was 6% prevalence of child labour (5 children below 14 years) in their study. Abhay Muddey et al¹¹ stated that there were 6 (3.75%) children in their study group.

There was no knowledge regarding Factory Act (1948) prohibition of child labour among these food handlers who worked in the Annachatras of the various Akhaadas of the Sadhugram at Tapovan and Trimbakeshwar. Their nature of work was related to cutting of vegetables, preparation of food, serving of food, washing utensils and keeping the kitchen premises clean. None of them had any specific training related to food industry.

Table 6: Association between education and knowledge, practice & hygiene assessment score (n=62)

Education	Knowledge score □ (out of 10)		Practice score** (out of 14)		Hygiene Assessment score*** (out of 7)		Total
	≥ 5	< 5	≥ 7	< 7	≥ 3	< 3	
Illiterate to Primary School	16	3	18	1	18	1	19
Middle to Secondary School	23	3	24	2	25	1	26
Higher Secondary & above	14	3	14	3	16	1	17
Total	53	9	56	6	59	3	62

* $\chi^2=0.34$, $df= 2$, $p= 0.84$, Not Significant; ** $\chi^2 =1.78$, $df= 2$, $p= 0.41$, Not Significant; *** $\chi^2=0.10$, $df= 2$, $p= 0.95$, Not Significant

Income levels ranged from Rs.2000 per month to Rs. 20,000 per month, depending on type of work and hours of work.8 (12.9%) food handlers were volunteers at the Kumbh Mela (doing SEVA or voluntary service) and not taking any salary or honorarium.

Regarding morbidities amongst the study population, common morbidities observed were GIT disorders (30.6%) like diarrhea & vomiting, Respiratory tract infections (19.4%), Discharge (9.7%) from ear/eyes/gums/mouth and Skin lesions (4.8%)like fungal infection, dermatitis, boils. These could be a result of poor environmental conditions, poor personal hygiene and low socio-economic status. GIT disorders due to heavy rains causing contamination of drinking water and Respiratory disorders could be related to the cold weather in Nashik at the time of Kumbh Mela during the study period. Abhay Mudey et al¹¹observed that anemia was the most common morbidity in their study (21.9%) followed by dental caries (10%), halitosis (10%) and scabies (5.6%). Dr. Prabhu et al¹³ observed that the most common disease among food handlers of their study were respiratory illnesses.

At the time of interview, 19 persons gave recent (in past 7 days) history of diarrhea and 3 had vomiting too. These persons could be a potential threat for spread of diseases. Only 3 persons gave history of recurrent GIT disorders. The past history was restricted to 6 months to facilitate better recall. In the past 6 months, 10 had food borne diseases, 8 had parasitic infections and 6 persons had history of typhoid. Only 1 person reported having a close family contact with typhoid (brother).

Feedback on questioning the food handlers regarding food borne diseases and personal hygiene revealed that 85.5% of the food handlers had heard about food borne diseases and their transmission via food handlers. Mass media was their main source of information. Anant Takalkar et al¹⁰observed that 95.2 % of their study subjects were aware about food borne diseases. Kasturwar et al¹⁴ observed that only 27 (32.5%) of their subjects were aware about food borne diseases.

54 persons responded that contaminated foods transmit disease, 51 responded that contaminated hands transmitted disease and 52 responded that contaminated water transmitted disease. 38 were aware of disease transmission via vectors like houseflies and cockroaches. 8 persons could name at least one disease transmitted due to lack of personal hygiene. This indicates overall good knowledge among food handlers regarding food borne diseases and personal hygiene in present study.

Feedback received on questioning the food handlers regarding personal hygiene practices revealed that most of them were aware of the importance of washing hands with soap and water after defecation and urination and before handling and serving food. About 70% were aware about minimum handling of food. 98% study subjects knew that fingering of nose is dangerous and can lead to transmission of infection. 95% subjects knew that licking of fingers can contaminate food. There was positive feedback regarding importance of wearing clean clothes/overalls, regular trimming of hair and nails and regular bathing. However, there was poor awareness regarding use of gloves, wearing cap/hair cover and covering the mouth and nose.

Assessment of personal hygiene by observation of the study subjects revealed that most of them had cut and clean hair, trimmed clean nails and clean hands. However, very few were using gloves and caps/hair cover. Only one person was using an apron.

M Anuradha et al¹²in their study observed that the practice was good in view of hand washing and personal hygiene (60%), using gloves, mask, cap while handling food (66.67%).

Naazia Kauser el al¹⁵ also assessed the base hygiene of the kitchen premises and facilities for preparation, storage and distribution of food additionally they examined microbial analysis of swabs of finger nails and region of skin between fingers of both hands.

38 (61.3%) workers were free from any addictions. The remaining 24 (38.7%) had one or more addictions. The addictions observed were use of Gutkha 11 (17.7%), tobacco chewing 11 (17.7%) and smoking 5 (8.1%), 1 alcoholic and 1 drug addict (ganja). 3 (4.8%)persons had more than one addiction. The low prevalence of addiction could be attributed to the religious nature of the Kumbh Mela which prohibits substance abuse of any kind. Abhay Mudey et al¹¹ observed that among their study participants, 39 (24.4%) were smokers,44 (27.5%) consumed alcohol daily,30 (18.8%) were in the habit of chewing tobacco and 32 (20%) were habituated to pan chewing. They observed that 32.5% persons had more than one addiction.

Work profiles of the study subjects revealed that most of the food handlers were involved in preparation and serving of food, while a few were involved in cutting of food items in housekeeping/cleaning. Many of the study subjects were involved in one or more of the above tasks. Only 5 persons had some formal training in basic hygiene. Pre-placement examination was done in only 7 persons. Workers Register was not maintained an-

anywhere probably due to migratory nature of work. Only 14 persons (22%) got sickness benefits from their employer in the form of monetary assistance and sick leave while the rest did not get any sickness benefits from their employers and were in fact not paid salary for the duration of absenteeism due to illness.

There was no significant association observed between education & knowledge score, education & practice score and education & hygiene assessment score. In spite of this, education definitely has an impact on knowledge/practices of personal hygiene among food handlers.

Dr. Prabhu et al¹³ gave handouts regarding “Golden Rules of food safety” by WHO to all study participants after data collection was over.

The results of present study help to generate the profile of food handlers and gives baseline information to plan corrective measures.

The problem areas that are identified in current study were: There is a need of improvement in personal hygiene of food handlers. Along with food hygiene, condition of raw food, water quality, garbage disposal etc. also have an impact surprisingly no overt cases of GIT disorders this could point to sub-clinical cases/carriers. Pre-placement examination of the food handlers should be carried out to improve food safety. Health education and training in food safety measures should be provided. Those food handlers who are suffering from infected wounds, boils, diarrhea, dysentery, throat infection etc. should abstain from food handling. Deworming of food handlers is needed.

CONCLUSION

The study showed that majority of food handlers were males and in the age group of 15-45 years. Most common diseases observed were gastrointestinal illnesses. In this research, there was satisfactory knowledge among food handlers regarding food borne diseases and their transmission. There was also satisfactory level of personal hygiene of food handlers in the study group. But there was no significant association between education level of food handlers and their knowledge and & practices regarding food borne diseases and personal hygiene.

Recommendations:

Steps should be taken to initiate the Five Keys Safe Food as suggested by the World Health Organization.¹⁶ Key 1: Keep clean; Key 2: Raw and cooked food should be kept separately; Key 3: Destroy hazards when possible; Key 4: Keep microorganisms

in food from growing; Key 5: Use safe water and raw material

In addition, it is necessary to Carry out pre-placement examination of the food handlers. Impart health education to the food handlers regarding their personal hygiene. Emphasize the use of gloves, hair covers and mask to prevent spread of diseases via nasal carriers and unclean hands.

LIMITATIONS: Sample size was small and time constraint was present, as the Kumbh-Mela is a temporary settlement of 4-6 months duration, so study subjects were not available for follow-up. There were administrative difficulties (some akhaadas not giving entry to outsiders in their kitchen) for including more number of food handlers.

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