



## Profile of catering staff at a tertiary care hospital in Mumbai

Prateek S Bobhate , Saurabh R Shrivastava , Pankaj Gupta

Seth G. S. Medical College and KEM Hospital, Mumbai

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### RESEARCH

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Please cite this paper as: Bobhate PS, Shrivastava SR, Gupta P. Profile of catering staff at a tertiary care hospital in Mumbai. AMJ 2011, 4, 3, 148-154  
Doi <http://doi.org/10.21767/AMJ.2011.633>

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#### Corresponding Author:

Dr Prateek S Bobhate

Final year MD Community Medicine,  
C/O Dr. Saurabh Shrivastava, Room No 401-  
A, Anand Niketan Quarters, Fitwala Road,  
Elphinstone, Mumbai 400013, Maharashtra,  
India

[prateekbobhate@yahoo.co.in](mailto:prateekbobhate@yahoo.co.in)

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### Abstract

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#### Background

Food borne illnesses, even today, continue to be a major public health problem in both developing and developed nations. Food handlers play an important role in ensuring food safety throughout the chain of production, processing, storage and preparation. Health of food handlers is of great importance for maintaining hygienic quality of food prepared and served by them. Thus, the present study was conducted to study socio-demographic characteristics, morbidity pattern and immunization status of catering staff at a tertiary care hospital in Mumbai

#### Method

A cross sectional study was conducted from August 2010 to November 2010. Out of the total of 162 food handlers working in 11 food service establishments, 137 were interviewed face to face using a semi-structured questionnaire, while remaining 25 food handlers were excluded because of either their absence or not giving consent. The food handlers were assessed clinically for personal hygiene and investigated for hemoglobin, stool routine and sputum AFB examination.

#### Results

82 (59.8%) food handlers were from the age group 10 – 29 years, 113 (82.5%) male, 95 (69%) married, 59 (43.1%) educated up to primary level. Only 7 (5.1%) had ever received a dose of typhoid vaccine. 103 (75.2%) had an addiction, majority consuming gutkha 59 (57.3%). Dental caries 32 (23.4%) was the most common morbidity identified. Entamoeba histolytica was isolated in 13 (9.5%)

subjects.

#### Conclusion

This study has confirmed an association between educational status and personal hygiene suggesting the need for greater personal hygiene in this group. Pre-employment and periodical medical examination should be encouraged.

#### Key Words

Food handler, personal hygiene, dental caries, periodic medical examination

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#### Background

Diseases spreading through food still remain a common problem resulting in appreciable morbidity and occasional mortality. Although numerous control strategies are in place, person-to-person disease transmission has not ceased. Food handlers play an important role in ensuring food safety throughout the chain of production, processing, storage, and preparation<sup>1</sup>. The mishandling of food and the disregard of hygienic measures enable pathogens to come into contact with food and, in some cases, to survive and multiply in sufficient numbers to cause illness in consumers. Personal hygiene and environmental sanitation are key factors in the transmission of food borne diseases. The health of the food handlers is of great importance for maintaining the quality of food prepared and served by them<sup>2</sup>. Food borne illnesses continue to be a major public health problem in both developing and developed nations. Between 1998 and 2004, an average of 9040 food borne disease outbreaks were reported to the Centre for Disease Control and Prevention (CDC). Approximately 4675 (52%) of these were attributed to food service establishments<sup>3</sup>.

In recent years, there has been an increasing trend toward the sale and consumption of prepared foods. This trend is more obvious in the urban areas, where due to the increasing population, changing lifestyle, breakdown of the extended family system, and increasing number of working women compel people to depend on "ready to eat" foods. The individuals may be able to satisfy their taste, but they pay little attention towards hygiene and food safety<sup>4</sup>.

Since medical institutions are supposed to provide a model



for healthy practices, including food services, it is expected that the food service establishments in their boundary and food handlers working there should not act as sources for food-borne diseases. Thus the present study was carried out in order to study the health status of food handlers working in food service establishments located within the premises of a tertiary care hospital in Mumbai.

## Method

A cross-sectional study was carried out in a tertiary care hospital in Mumbai for a period of 4 months (August – November 2010). Institutional Ethics Committee approval was obtained. Sampling method employed was convenience sampling. “Food handler” was defined as any person employed in the food premises, who at any time may be involved in the preparation, serving, washing or packing of food for sale. All the food handlers working in the food establishments (messes, canteens, kitchen, etc) in the campus of the tertiary care hospital were assessed for evaluating their health status.

Inclusion criteria - Food handlers who were working for more than 6 months in their food establishments and those giving consent for the study.

Exclusion criteria - The owners/receptionists were not included as they were not handling the food. Food handlers who were working for less than 6 months, not giving consent or not available for interview.

A total of 3 visits were paid to all 11 food establishments so as to include all the food handlers in the study. The purpose of the study was explained to the food handlers and their informed consent was taken. The food handlers who could not be contacted even after the 3 visits were excluded from the study. Due care was taken so as not to affect their routine work activities.

Out of the total of 162 food handlers working in 11 food service establishments, 137 were interviewed face to face after taking their informed consent regarding their socio demographic characteristics, hygienic practices, history of substance use, history of disease if any within past 3 months, immunization status and pre placement and in-service medical examination. 25 food handlers were excluded from the study because of either their absence or not giving consent. An arbitrary 10 point scale was devised for classifying the level of personal hygiene of food handlers. The scale included hygiene & sanitation component about wearing clean clothes, use of gloves, use of hair cap, cutting of hairs, washing of hands, cutting of nails, use of towels, bathing frequency, brushing of teeth & use of footwear. A score of 1 was given for 1 appropriate

hygienic practice. Thus, they were classified as good  $\geq 7$  score, fair = 4-6 score & poor  $\leq 3$  score.

The food handlers were assessed head to toe clinically for presence of any morbidity. All the subjects were also subjected to laboratory investigations like hemoglobin estimation (*Sahli's method*), stool routine (*direct smear method and salt concentration method*). Two sputum examinations for acid fast bacilli were done only for those subjects who had relevant history (i.e. cough  $\geq 2$  weeks). Data was then compiled, analysed and appropriate conclusions were drawn. Analysis was done using SPSS version 17 and appropriate statistical measures were used.

## Results

31 (22.6%) were from 10 – 19 years age group while a large proportion of subjects 51 (37.2%) were in the age group of 20 – 29 years. It is interesting to note that 13 (9.4%) subjects were below 14 years of age (Table 1). Majority 113 (82.5%) were male while rest 24 (17.5%) were female (Table 1).

Out of the total 137 subjects, 34 (24.8%) were illiterate, 59 (43.1%) were educated up to primary school followed by 31 (22.6%) up to secondary school. Only 13 (9.5%) were educated above secondary level of school (Table 1). A large fraction 43 (31.4%) were waiters followed by 32 (23.4%) cooks, 27 (19.7%) dish washers and 16 (11.7%) were delivery boys (Table 1). Out of the 137 subjects, 42 (30.7%) were unmarried (Table 1).

It was observed that 18 (52.9%) subjects who were illiterate had poor personal hygiene while 19 (61.3%) subjects with secondary education had good personal hygiene. The association between education and personal hygiene was found to be statistically significant ( $p < 0.05$ ) indicating that as the level of education increases, there is improvement in personal hygiene (Table 2).

It was also observed that only 7 (5.1%) subjects had received a dose of typhoid vaccine, of which, only 2 (1.5%) had received booster doses while 130 (94.9%) had not received any dose of typhoid vaccine (Table 3). It is also evident that only 17 (12.4%) had undergone a pre placement examination while rest 120 (87.6%) had not undergone any such examination. Majority 126 (92%) did not undergo any periodic medical examination (Table 3).

On clinical examination, 57 (41.6%) 41.6 % did not have any health related complaints and examination did not reveal any abnormalities while remaining 80 (58.4%) were suffering from one or another type of morbidity. Overall, dental caries 32 (23.4%) was the most common current morbidity identified which was mostly because of 59 (57.3%) of subjects were addicted with tobacco in various forms (gutkha / kharra /dry tobacco with lime) Table 4). It was followed by acute respiratory infections 27 (19.7%),



pallor 26 (19%) and pain in abdomen/acidity 22 (16.1%) respectively (Table 5).

Regarding the morbidities in past 3 months, 30 (21.9%) subjects had suffered from febrile illness, 29 (21.7%) cough / cold / sore throat, 24 (17.5%) diarrhoea / dysentery and 21 (15.3%) skin infections (Table 6).

On analysing type of work performed by the subjects and their personal hygiene, a highly significant association was observed. 42.9% of the delivery boys had good hygiene, 46.9% of the cooks had fair hygiene while majority of the washers 70.4% had poor hygiene levels (Table 7). The mean score of hygiene using the arbitrary scale among the cooks was 5.5, 5.3 for waiter, 3.8 for washers and 5.7 for delivery boys/ helper.

On stool examination, *Entamoeba histolytica* was the most common parasitic species isolated in 13 (9.5%) subjects. The other species isolated were *Ascaris lumbricoides* 7 (5.1%), *Ancylostoma duodenale* 5 (8.8%), *Strongyloides* 5 (3.6%), *Taenia* 3 (2.2%) (Table 8). On haemoglobin estimation, 32 subjects were found to be anaemic, of them, 23 (16.8%) were mildly anaemic, 7 (5.1%) moderate and 2 (1.5%) severely anaemic. Sputum examination for acid fast bacilli (AFB) was done in 17 subjects, of whom, 1 subject had sputum AFB positive (Table 8).

## Discussion

A large proportion of subjects 51 (37.2%) were in the age group of 20 – 29 years while 31 (22.6%) were from 10 – 19 years age group. It was found that 13 (9.4%) subjects were below 14 years of age. From these 13 subjects, 11 (84.6%) were educated only till primary standard. Similar results were obtained by Ud giri RS, et. al. <sup>6</sup> who found that 73.2% of respondents were below 30 years of age and only 9 (2.72%) respondents were above 50 years.

In our data, 57 (41.6%) subjects were apparently healthy while the remaining 80 (58.4%) were morbid. Overall, dental caries was the most common morbidity identified in 32 (23.4%) followed by acute respiratory infections 27 (19.7%), pallor 26 (19%) and pain in abdomen/acidity 22 (16.1%) respectively while in a study done by Ud giri RS, et. al. <sup>6</sup> it was observed that 124 were healthy. The remaining 208 (62.65%) respondents had one or more health problems, anaemia being the commonest (29%) followed by, oro-dental disease (20%), gastro-enteritis (12.6%) and febrile illness (11.33%) were the major morbidities. Parasitic infestation was found in 22 (9.7%)

47 (34.3%) of the food handlers were found to have poor level of hygiene. Similar results were obtained in a study done in New Delhi by R Malhotra et. al. <sup>7</sup>

Personal hygiene was found to be significantly associated with education status. Similar findings were observed in a study done by U Mohan et. al. <sup>5</sup>

Immunization with typhoid vaccine was found in only 7 (5.1%) food handlers while in a study done in Malaysia immunization with typhoid vaccine was found in almost 59.6% of the food handlers <sup>8</sup>.

Present study showed that only 17 (12.4%) had undergone a pre-employment medical examination while none of them had such an examination done in a study done by B Abera et. al. <sup>9</sup>

Most common organism to be isolated from stool sample was *E. histolytica* found in 13 (9.5%) subjects. Similar results were obtained in a study done by V. Mohan et. al. <sup>8</sup> in Amritsar while *Trichuris trichiura* was found to be the most common organism in a study done in Saudi Arabia <sup>11</sup>. In a study by OA Idowu et. al. <sup>12</sup> parasites observed were *Entamoeba histolytica* with a prevalence of 72%, *Ascaris lumbricoides* (54%), *E. vermicularis* (27%), *Trichuris trichiura* (24%). In the present study, the overall prevalence of intestinal parasite infestation was found to be 26.3%. V Mohan et. al. <sup>10</sup> observed the overall prevalence of intestinal parasite infestation to be 14% whereas in a study by OA Idowu et. al. <sup>12</sup> 97% of the food vendors were infected with one or more faeco-orally transmissible parasites. Such a high prevalence of intestinal parasites can be largely due to poor personal hygiene practices and environmental sanitation, lack of supply of safe water and poverty. There were limitations to our study. Assessment of carrier status was not done. Nail samples and hand wash samples were not taken for laboratory analysis and knowledge and perceptions of subjects regarding various food handling practices was not assessed.

## Conclusion

This study has demonstrated the association between educational status and personal hygiene suggesting the importance of improving education to improve the general hygiene of food handlers. Child labour should be discouraged by employers of the food establishments as it hampers their education. Immunization with typhoid vaccine was found to be worse in the present study as compared to that in Malaysia. Intestinal infections among the food handlers were found to be similar to that found in Amritsar city while they were much better than that found in Nigeria. Pre-employment and periodical medical examination should be encouraged.

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#### CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

#### Peer review

Not commissioned. Externally peer reviewed.



## Figures and Tables

Table 1: Distribution of subjects according to socio – demographic variables

Socio demographic variables		Number (Percentage)
Age group (years)	10 – 19	31 (22.6%)
	20 – 29	51 (37.2%)
	30 – 39	25 (18.2%)
	40 – 49	19 (13.9%)
	> 50	11 (8%)
Sex	Male	113 (82.5%)
	Female	24 (17.5%)
Education	Illiterate	34 (24.8%)
	Primary	59 (43.1%)
	Secondary	31 (22.6%)
	Above	13 (9.5%)
Type of work	Cook	32 (23.4%)
	Waiter	43 (31.4%)
	Dish washer	27 (19.7%)
	Helper	19 (13.9%)
	Delivery boy	16 (11.7%)
Marital status	Married	95 (69.3%)
	Unmarried	42 (30.7%)

Table 2: Relationship between education and personal hygiene

Education	Personal hygiene			Total
	Good	Fair	Poor	
Illiterate	5 (14.7%)	11 (32.4%)	18 (52.9%)	34 (100%)
Primary	14 (23.7%)	23 (39%)	22 (37.3%)	59 (100%)
Secondary	19 (61.3%)	7 (22.6%)	5 (16.1%)	31 (100%)
Above	7 (53.8%)	4 (30.8%)	2 (15.4%)	13 (100%)
Total	45 (32.8%)	45 (32.8%)	47 (34.3%)	137 (100%)

Chi square – 23.91      df – 6      p < 0.05

Table 3: Distribution of food handlers according to immunization status & medical examination

Typhoid vaccine		Number of subjects (%)
Any dose	Yes	7 (5.1%)
	No	130 (94.9%)
Booster dose	Yes	2 (1.5%)
	No	135 (98.5%)
Medical examination		
Pre employment examination	Yes	17 (12.4%)
	No	120 (87.6%)
Periodic examination	Yes	11 (8%)
	No	126 (92%)



Table 4: Distribution of food handlers according to type of addiction

Addiction	Number of subjects (%)
Cigarette / Bidi	42 (40.8%)
Gutkha	59 (57.3%)
Kharra	27 (26.2%)
Dry tobacco with lime / Betel quid	31 (30.1%)
Alcohol	46 (44.7%)
No addiction	34 (24.8%)

Table 6: Illnesses / injuries suffered in previous three months

Illness / Injuries	Number of subjects (%)
Diarrhoea / Dysentery	24 (17.5%)
Cough / Cold / Sore throat	29 (21.7%)
Febrile illness	30 (21.9%)
Pain in abdomen / Acidity	13 (9.5%)
Worms in stools	7 (5.1%)
Injuries (Mechanical / Burns)	15 (11%)
Burning micturition	4 (3%)
Diminished vision / Conjunctivitis	9 (6.6%)
Skin infections	21 (15.3%)
New case of DM / HTN / DM+HTN	8 (6%)

Table 5: Distribution according to type of work and morbidity

Morbid condition	Cook	Waiter	Washer	Helper / delivery boy	Number (%)
Apparently healthy	13 (22.8%)	20 (35.1%)	14 (24.6%)	10 (17.5%)	57 (41.6%)
Pallor	4 (15.4%)	12 (46.1%)	4 (15.4%)	6 (23.1%)	26 (19%)
Fever	3 (15.8%)	6 (31.6%)	6 (31.6%)	4 (21%)	19 (13.9%)
Diarrhoea / Dysentery	6 (31.6%)	5 (26.3%)	3 (15.8%)	5 (26.3%)	19 (13.9%)
Pain in abdomen / Acidity	11 (50%)	7 (31.9%)	1 (4.5%)	3 (13.6%)	22 (16.1%)
Worms in stools	1 (20%)	2 (40%)	1 (20%)	1 (20%)	05 (3.6%)
Dental caries	12 (37.5%)	13 (40.6%)	3 (9.4%)	4 (12.5%)	32 (23.4%)
Injuries on skin	6 (50%)	1 (8.3%)	1 (8.3%)	4 (33.4%)	12 (8.8%)
Acute respiratory infections	13 (48.1%)	7 (26%)	5 (18.5%)	2 (7.4%)	27 (19.7%)
Scabies	1 (25%)	1 (25%)	2 (50%)	0	04 (2.9%)
Ringworm infections	2 (28.6%)	2 (28.6%)	0	3 (42.8%)	07 (5.1%)
Known case of DM / HTN / DM+HTN	5 (62.5%)	1 (12.5%)	2 (25%)	0	08 (5.8%)



Table 7: Type of work Vs personal hygiene

Type of work	Personal hygiene			Total
	Good	Fair	Poor	
Cook	10 (31.3%)	15 (46.9%)	7 (21.8%)	32 (100%)
Waiter	17 (39.5%)	13 (30.2%)	13 (30.2%)	43 (100%)
Washer	3 (11.1%)	5 (18.5%)	19 (70.4%)	27 (100%)
Helper / delivery boy	15 (42.9%)	12 (34.3%)	8 (22.8%)	35 (100%)
Total	45 (32.8%)	45 (32.8%)	47 (34.3%)	137 (100%)

Chi square 22.5      df 6      p < 0.01

Table 8: Distribution according to laboratory investigations

Laboratory investigations	Results	Number of subjects (%)
Stool examination (N = 137)	Entamoeba histolytica	13 (9.5%)
	Ascaris lumbricoides	7 (5.1%)
	Ancylostoma duodenale	8 (5.8%)
	Taenia	3 (2.2%)
	Strongyloides	5 (3.6%)
Haemoglobin levels (N = 137)	Normal	105 (76.6%)
	Mild	23 (16.8%)
	Moderate	7 (5.1%)
	Severe	2 (1.5%)
Sputum AFB (n = 17)	Positive (1 / 2 samples)	1 (5.9%)
	Negative	16 (94.1%)