

Study of sociodemographic characteristics and awareness about personal hygiene among the food handlers

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Received March 26, 2015. Accepted April 2, 2015

Abstract

Background: The contamination of food items prepared in food establishments depends largely on the health status of food handlers and their hygiene, behavior, and practices. The transmission of the microorganisms and/or their toxins responsible for food-borne illnesses among medical, dental, and nursing students depends on the health status and hygiene of handlers and on the sanitary conditions of the food establishments.

Objective: To assess the health and hygiene status of the food handlers and to evaluate the sanitary conditions of food establishments of teaching hospitals.

Materials and Methods: A cross-sectional study using purposive sampling technique was conducted from August 2013 to July 2014, on all 181 food handlers working in the food establishments of three teaching hospitals in Bareilly.

Result: Of the total (181) mess workers, majority (47%) were of age group younger than 20 years; 84% were male subjects, and 49.7% belonged to other backward castes. About 51.4% were illiterates, 60.2% from urban areas, 40.9% main cook, 56.9% below poverty line, 47% duration of service <1 year, 87.3% not taken training, 53% immunized against tetanus. But, 51.4% were not immunized for typhoid in the last 3 years, and 56.9% had not taken antiworm chemoprophylaxis. Totally, 96.7% were with satisfactory personal hygiene, 65.2% not using gloves, 51.4% cutting their nails every week, and 86.2% washing their hands after toilet usage regularly. However, 82.9% were not washing their hands before cooking/serving foods, and 87.8% were not having any kind of disease; 5% were found clinically positive for various diseases when examined at work.

Conclusion: Although the level of awareness about benefits of personal hygiene were very high among the food handlers and the health, hygiene status of food handlers and sanitary conditions of food establishments were found to be satisfactory, their immunization coverage was not satisfactory. So, there should be a regular evaluation program conducted with the intentions to maintain health, hygiene status of food handlers and to maintain sanitation of food establishments. Certain preventive measures can also be introduced during the implementation of these evaluation programs.

KEY WORDS: Health status, personal hygiene, food handlers, mess workers, food establishments

Access this article online

Website: <http://www.ijmsph.com>

DOI: 10.5455/ijmsph.2015.26032015251

Quick Response Code:



Introduction

Students studying and learning in various medical, dental, and nursing institutes are the future workforce for health sector. As they have been studying and learning continuously throughout day and night for many years in these institutions and as they do not have enough time to cook food for themselves, majority of the students who are away from their

homes usually take their food from the food establishments (i.e., messes and canteens situated and preparing food items usually in the same campus where students reside). These food items may become the source of various food-borne infections to the students if the persons handling these food items are already infected with any kind of these infections and the food items become contaminated during various processes such as cooking, storing, transporting, and distributing.

Therefore, it is necessary to prevent and control these food-borne infections among students who become a part of the country's growth in the future, especially in health-care system, which has an important role in growth of all the aspects of the nation (e.g. economic growth, social development, etc.) The maintenance of the health status of the food handlers and keeping them free from various infectious diseases are the key factors for the prevention of the communicable diseases among students too.

A "food handler"^[1] is someone who is involved in the preparation, cooking, serving, or transportation of food in any part of the institution: for example, any person who handles food during collecting raw food items, during cooking, during storing cooked foods, and distributing cooked food items. The chances of food contamination largely depend on the health status of these food handlers and their hygiene, habits, and practices of food handling. Usually, these food handlers are appointed without proper health examination; therefore, routine health checkups and health examinations of these food handlers should be done on regular basis in their working place (i.e., in the messes and canteens of teaching hospitals). In addition, inspections of hygiene and sanitary conditions of these places should also be done routinely to keep these places neat and clean.

Although various studies^[2-4] were conducted in different parts of the world and in the country in various subgroups of the populations to evaluate the safety measures adopted by food handlers during various food handling processes and to evaluate knowledge, attitude, and practices of the food handlers in various types of food establishments, the study area/region was lacking of such types of studies,^[5-7] especially on food handlers working in food establishments of teaching institutions. As there was no study conducted in the region, especially in the food establishments of campuses of teaching institutions, this study is an honest effort in this direction with the following objective.

Objective

1. To assess the health and hygiene status of food handlers working in the food establishments of teaching hospitals.
2. To evaluate the sanitary conditions of food establishments of teaching hospitals.

Materials and Methods

This cross-sectional study using "survey method" was carried out for 1 year (from August 2013 to July 2014) by

purposefully selecting all the food handlers/mess workers/canteens workers who have worked any period of time during the 1-year study period in all the 18 food establishments (messes and canteens) run/managed by the same management running/managing all the four important teaching hospitals in the Bareilly District of Uttar Pradesh, India. On average, these 18 food establishments have been serving eatables to approximately 2,399 medical students in the campuses of three teaching hospitals in the Bareilly city of Uttar Pradesh. The survey was carried out by several visits of four researchers till all food handlers worked during the study period were covered.

The research schedule was used to evaluate the knowledge and practices of food handlers about their personal hygiene and sanitary measures adopted in food establishments. In addition, using schedule, we had assessed the health status of food handlers and preventive measures used by them in the last 3 months.

Schedule has been designed to obtain information about the demographic characteristics such as age, sex, education, caste/category, below poverty line (BPL) or above poverty line (APL). The cutoff for BPL in rural and urban areas of Rs. 816 and Rs. 999 per capita per month, respectively, as given by the Planning Commission of India (PCI) for Twelfth Five-Year Plan (2012–2017), was used in this study.^[8] Using schedule, we also obtained information about the occupation of food handlers (e.g., job type, job duration, and training taken).

During survey, the health status of food handlers was assessed for communicable diseases, especially about food-borne infections such as acute diarrheal disease, and systemic disorders such as hypertension and diabetes mellitus. We also assessed whether the food handlers were vaccinated or given chemoprophylaxis against important communicable diseases such as typhoid and tetanus and against worm infestations in the last 3 months. Data were analyzed using Microsoft Excel 2010,^[9] and Statistical Packages for Social Sciences (SPSS), version 12.0.^[10] The χ^2 -test was used as test of significance. The *p*-value less than 0.05 was considered as significant.

Result

There were 181 food handlers working in 18 food establishments; of these, 47.0% younger than 20 years, 35.4% of the age group 21–30 years, and no children of age younger than 15 years were found to be working in the study area and study period. In this study, majority of the food handlers were male subjects (84.0%). The other demographics are as follows: from urban areas (60.2%), belonged to other backward castes (49.7%), possessed no formal education (51.4%), chief/main cook (40.9%), waiter/service/helper (37.0%), BPL (56.9%), handlers who had been working in these food establishments for up to or less than 5 years (83%), and those who had not taken any formal training of food handling (87.3%) [Table 1].

Table 1: Distribution of food handlers as per their socioeconomic and demographic characteristics in the food establishments of teaching hospitals in Bareilly

Socioeconomic and demographic characters, N = 181 (100%)	Number	Percentage
Age (years)		
≤20	85	47.0
21–30	64	35.4
31–40	16	8.8
41–50	8	4.4
≥50	8	4.4
Sex		
Male	152	84.0
Female	29	16.0
Category		
General	29	16.0
OBC	90	49.7
SC/ST	62	34.3
Educational status		
No formal education	93	51.4
Primary	43	23.8
Secondary education	33	18.2
Others	12	6.6
Job type		
Chief/main cook	74	40.9
Dishwasher	24	13.3
Vegetable cutter	16	8.8
Waiter/service/helper	58	37.0
Residence		
Urban	109	60.2
Rural	72	39.8
Income group (for BPL cutoff income: urban, <Rs. 538.60; rural, Rs. <356.35)		
BPL	103	56.9
APL	78	43.1
Duration of service (years)		
≤1	85	47.0
1–5	66	36.5
6–10	28	15.5
11–20	2	1.1
Training taken/courses done		
Yes	23	12.7
No	158	87.3

During the survey, when the handlers were interviewed for their level of awareness about their personal hygiene (e.g., for their awareness about benefits of daily bathing/changing of clothes/tidy hair/use of foot wear), 96.7% responded that they know about the benefits and they never/less frequently become ill [Table 2].

In these food establishments, 34.8% food handlers had been using gloves while handling food items during their work. Majority of the handlers were cutting their nails regularly [once in a week (51.4%) and twice in a week

Table 2: Awareness about personal hygiene among food handlers, N = 181 (100%)

Response ^a	Number	Percentage
Yes	175	96.7
No	6	3.3

Awareness about benefits of personal hygiene (e.g., daily bathing/ changing of clothes/tidy hair/use of foot wear).

^aSingle response (one response = one mess worker).

(47.5%)] and had been using soap for washing hands after coming from toilet (86.2%). The hand washing before handling of foods (cooking/serving) was not practiced at all among 82.9% handlers [Table 3].

In this study, the majority of food handlers [118 (65.19%)] were not using gloves while handling food items in the food establishments of teaching hospitals, and among them, majority were literates [58 (66%)]. This result was not found to be significant. More illiterates were using gloves as more illiterates were working as food handlers in these food establishments [Table 3].

In this study, 36.18% male subjects and 27.59% female subjects had been using gloves for food handling. Genderwise distribution of gloves users is representative as 83.98% workers in the mess were male subjects and 16.02% female subjects. This may be the reason why the statistical association between gloves use and gender was insignificant [Table 3].

Of the total food handlers belonging to rural residence, 50% used gloves during their job; but, of the total urban dwellers, only 24.77% used gloves during their job. This result was found to be statistically significant [Table 4].

In this study, we also evaluated the preventive measures taken by food handlers in these food establishments. It was observed that 53% had taken tetanus vaccines in last 5 years, 48.6% had taken typhoid vaccine in last 3 years, and 43.1% had taken antiworm (i.e., albendazole tablets, 400, mg once in last 3 months, from the date of survey) [Table 5].

Discussion

The study revealed that majority of the food handlers (82.4%) were younger than 30 years and not a single child of age younger than 15 years was found working in the food establishments in the three campuses of teaching hospital during the study period. In the study by Mudey *et al.*,^[11] performed during October–December, 2009, in Wardha, Maharashtra, it was shown that majority (54.37%) of the food handlers were younger than 30 years, similar to this study. However, they also reported that 3.75% were children younger than 10 years in their study; in our study, we had not found a single child of even age younger than 15 years. Udgiri and Masali^[12] also reported that, in their study, the majority (73.2%) of handlers were younger than 30 years, which

Table 3: Personal hygiene practices of food handlers during working in various messes in hostels/canteens

Types of personal hygiene practices, N = 181 (100%)	Response ^a	Number	Percentage
Whether using gloves during work	Yes	63	34.8
	No	118	65.2
Frequency of nail cutting	Once in a week	93	51.4
	Twice in a week	86	47.5
	Once in 2 weeks	2	1.1
Washing hands after coming from toilet	With water	25	13.8
	with soap	156	86.2
Washing hands before cooking/serving foods	Yes	31	17.1
	No	150	82.9
Using gloves	Yes	63	34.81
	No	118	65.19
Illiterates using gloves	Yes	33	35.48
	No	60	64.52
Literates using gloves*	Yes	30	34
	No	58	66
Men using gloves	Yes	55	36.18
	No	97	63.82
Women using gloves**	Yes	8	27.59
	No	21	72.41

^aSingle response (one response = one mess worker).

* $\chi^2 = 0.0387$ for gloves use and literacy status. $p = 0.844117$. This result is not significant at $p < 0.05$.

** $\chi^2 = 0.7934$. $p = 0.373074$. This result is not significant at $p < 0.05$.

Table 4: Food handlers using gloves and their residence

Residence	Using gloves, n (%)		Total, n (%)
	Yes	No	
Urban	27 (24.77)	82 (75.23)	109 (100) (60.22)
Rural	36 (50)	36 (50)	72 (100) (39.78)
Total	63 (34.81)	118 (65.19)	181 (100)

$\chi^2 = 12.1626$. $p = 0.000488$. This result is significant at $p < 0.05$.

Table 5: Preventive measures taken by food handlers in the last duration of time

Activities, N = 181 (100%)	Response	No. of subjects	Percentage
TT injection in the last 5 years	Yes	96	53.0
	No	85	47.0
Anti-typhoid in the last 3 years	Yes	88	48.6
	No	93	51.4
Antiworms tablets in the last 6 months	Yes	78	43.1
	No	103	56.9

is similar to ours. In a study conducted by Aziz and Dahan,^[13] in the school canteens in Malaysia, the majority of the respondents were of age group 45–54 years (26.1%).

The results showed that majority of the food handlers were male subjects (84.0%) and from urban areas (60.2%). Similarly, in the study by Mudey et al.,^[11] the majority of food

handlers were male subjects (69.38%). However, in their study, majority were from rural areas; this is because of their place of study, which was performed in rural areas.

Our place of study was in urban areas; so, the majority of handlers belonged to the urban areas in this study. The observations of Isara and Isah^[14] on gender distribution slightly differed from our study as they had reported that female subjects were in majority (65.1%) in their study; the study conducted by Aziz and Dahan^[13] in the school canteens too revealed that the majority of food handlers were female subjects (76.4%).

No formal education by food handlers (51.4%) was taken in this study. This much lower literacy rate was observed among food handlers in this study may be the reflection of lower literacy rate (69.72%)^[15] of the state from where the food establishments belonged. Isara and Isah^[14] reported higher formal education (98%) among food handlers in their study. According to the Malaysian study in the school canteens, the majority (68.7%) of the respondents had education up to secondary level.

It was observed in this study that only 12.7% food handlers had taken training of handling food (i.e., cooking, serving, etc.), which is a low feature when compared with the other similar studies from various parts of the world. For example, in the Malaysian study,^[13] 72.3% of the food handlers had their formal training, which is a higher figure than the figure reported by this study.

In the study it was observed that majority (47.0%) of the handlers had work experience of one or less than one year

and 15.5% had work for 6-10 years whereas in the study^[13] carried out in Malaysia 37.4% handlers had working experience more than 8 years as food handlers.

In this study, the preventive measures taken by the food handlers were very low as the immunization coverage against commonly occurring diseases such as tetanus (53%) and typhoid (48.6%) was very unsatisfactory. In addition, Chemoprophylaxis against worm infestation was also very low (43.1%) among the food handlers in this study.

Regarding the level of awareness about personal hygiene, which included various activities such as daily bathing, changing of clothes, tidy hair, and use of foot wear, in this study, 96.7% responded that they know about the benefits and they never/less frequently become ill. Of the total, 34.8% food handlers used gloves while handling food items during their work in food establishments. Majority of the handlers were cutting their nails regularly (i.e., 51.4%, once in a week; 47.5%, twice in a week), and used soap for hand washing after coming from toilet (86.2%). The hand washing before handling of foods (cooking/serving) was not practiced at all among 82.9% handlers. Of the total, 12.2% showed positive for various diseases such as dental caries (6.6%), anemia (2.2%), hypertension (1.1%), cough/cold (1.1%), scabies (0.6%), and fungal infection (0.6%). Similar studies carried out in various parts of the country and world had reported variable data about morbidities among food handlers due various diseases. According to the study carried out by Rathore,^[16] it was reported that 25.33% of food handlers revealed one or more illnesses in the last 6 months, which was two times more common than this study, and anemia was found in 21.87%, which was approximately three times more common than this study. Another study by Chitnis^[17] reported morbidities in 74.13% and anemia in 22.13%. In this study, the morbidities were reported in relatively lesser numbers of food handlers, which may be because of being absent due to illness from job at the time of the survey. Anemia was the next frequent cause of the illness among the food handlers in this study, as the most common cause was dental caries.

Conclusion

The large number of population served by these food handlers were students. In this study, it was observed that, although the levels of awareness about personal hygiene and about benefits of personal hygiene were very high among the food handlers, majority of them were not using gloves while handling foods. Although frequencies of nail cutting and hand washing with soap after coming from toilet and before food handling were found satisfactory among the food handlers, their immunization coverage was not satisfactory. So, it can be concluded that the incidence of illness and the coverage level of immunization cannot be considered satisfactory; on the basis of inferences of this study, it can be suggested that there should be a regular

evaluation program conducted in these food establishments for the food handlers along with certain preventive measures being emphasized to these handlers.

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How to cite this article: Singh A, Chaudhary V, Agarwal K, Joshi HS, Narula K, Chandra R. Study of sociodemographic characteristics and awareness about personal hygiene among the food handlers. *Int J Med Sci Public Health* 2015;4:1212-1217

Source of Support: Nil, **Conflict of Interest:** None declared.