



A Study of impact of Education on Awareness, Personal Hygiene and Practices of food handlers of a Tertiary Care Hospital in Kashmir, India

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ABSTRACT

Background Each year 9.4 million people suffer from food borne diseases throughout the world; everyday cases related to food borne diseases are recorded in all countries from the most to the least developed ones. A major risk of food contamination lies with the food handlers. Several food borne disease outbreaks have been reported to have been associated with poor personal hygiene of people handling food stuffs.

Method A questionnaire was structured for the purpose of data collection to find out effect of educational background on personal hygiene, awareness regarding transmission of food borne infections and routine practices among food handler of the food establishments of a super speciality teaching hospital of Kashmir.

Results Out of 121 respondents (33.05 percent cooks, 42.97 percent stewards and 23.97 percent dishwashers), 90.90 percent were males and 9.10 percent females. Majority (90.90 percent) have educational background below high school level (group B) and the rest (9.10%) have education above 10th standard (group A). Soap was used by majority (90.9%) of group A in comparison to group B (59.1%) before entering kitchen. 72.7% of group A employees change their shoes and use kitchen slippers in the kitchen, whereas only 31.8% of group B employees do so and the rest (68.2%) do not change the foot wear before entering the kitchen. While 81.8% of group A employees responded that diarrhoeal diseases spread by contaminated food, majority of group B (62.7%) responded other reasons. 81.8% of group A feel it necessary to chlorinate or filter visibly clean water, whereas only 52.7% of group B feel so.

Conclusion Food handlers of any food establishment, in particular hospital kitchen should have high standard of educational background to have enough awareness regarding food borne diseases and importance of personal hygiene to prevent transmission of diseases. Because of poor educational background, the food handlers in our study didn't know the importance of use of soap & therefore despite availability of soap in washrooms, 59.1% of group B employees wash their hands with plain water before commencing their work. Lack of awareness of transmission of food borne infections & personal hygiene are secondary to lack of knowledge due poor education.

Keywords: Food borne diseases, food handlers, unaided eye, food hygiene, Knowledge

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INTRODUCTION

Food is a potential source of infection and is liable to contamination by micro-organisms at any point during its journey from the producer to the consumer. Food borne diseases continue to be a major public health problem in the developing and developed world alike. Each year 9.4 million people suffer from food borne diseases throughout the world. Everyday cases related to food borne diseases are recorded in all countries from the most to the least developed ones^[1]. Although significant advances have been made with respect to food safety, in many countries inadequate practices and surveillance systems persist and there is often a risk of food being microbiologically hazardous to the consumer. A major risk of food contamination lies with the food handlers. Several food borne disease outbreaks have been reported to have been associated with poor personal hygiene of people handling food stuffs². Dangerous organisms present in or on the food handlers body can multiply to an infective dose, given the right conditions and come in contact with food or surfaces used to prepare food³. Improper food handling practices contribute to 97 percent of food borne illness in food services establishments and houses. Infections which are likely to be transmitted by food handlers are diarrhoeas, dysenteries, typhoid and paratyphoid; enter viruses, protozoa cysts, eggs of helminthes etc. The primary aim of food hygiene is to prevent food poisoning and other food borne diseases. During the acute stages of diseases such as gastroenteritis, large numbers of organisms are excreted and can be widely dispersed. Food handlers need to have sufficient knowledge of clean habits and personal hygiene, such as frequent and thorough hand washing. It is all the more essential in hospital settings, where patients are more vulnerable to infections including those caused by unhygienic food. Present study was therefore undertaken in the food establishments of a 650 bedded tertiary care super-specialty hospital of Kashmir to cast

light on the effect of educational on personal hygiene, knowledge regarding transmission of food borne illnesses & routine practices of food handlers of the food establishments running in the hospital

METHODS

A cross sectional study was conducted in the central patient kitchen, staff canteen, attendant canteen & nursing hostel mess running in the hospital. A self structured Questionnaire was pre-tested and then applied for the purpose of data collection. Only those employees who are directly associated with cooking (Cooks) handling of cooked food (Stewards) and cleaning of kitchen utensils (Dishwashers) were included in the study. Managers, rice cleaners, store keepers were excluded from the study. Help of managers was however sought to explain the questionnaire in local language wherever necessary. To find out the effect of educational background of food handlers on their personal hygiene, awareness & routine practices, the study group was categorised as group 'A' and group 'B' with educational qualification above 10th standard and below 10th standard respectively. Chi-square test was applied to study the relationship between the two groups (A & B) and the p-value less than 0.05 was considered significant.

RESULTS

All the respondents in our study are fulltime employees of the Department of Dietetics and Therapeutics (D&T) of the hospital. Out of 121 respondents in the present study, 40 (33.06%) were cooks, 52 (42.97%) were stewards and 29 (23.97%) were Dishwashers. Males were 110 (90.90%) and rest 11 (9.10%) were females. Majority of the food handlers (90.90%) had education qualifications below high school level (39 cooks, 42 Stewards, 29 Dishwashers), 10 (8.2%) were either high school graduates or college graduates, only one (0.83%) has post-graduate qualification (Table 1).

Table 1 Personal profile of the respondents.

Demographic Information (n = 121)	N	Percentage
Gender		
Male	110	90.90%
Female	11	9.10%
Educational Qualification		
Up to High School level	110	90.90%
High School Graduate and/or College Graduate	10	08.27%
Post Graduate	01	0.83%
Occupation		
Cooks (C)	40	33.05%
Stewards (S)	52	42.98%
Dishwashers (D)	29	23.97%

Table 2 Information about Personal Hygiene (n=121)

Information	Above 10 th Standard		Up to 10 th Standard	
	No.	%age	No.	%age
Do you wash hands before entering kitchen?				
Yes	11	100.00	110	100.00
With water only	01	9.1	54	40.9
With soap	10	90.9	65	59.1
Do you wash hands after visiting toilets?				
Yes	11	100.00	110	100.00
With water only	0	0	34	30.9
With soap	11	100	76	69.10
Frequency of trimming nails?				
Daily	0	0	5	4.5
Twice a week	10	90.9	43	39.1
Weekly	0	0	38	45.5
More then a weeks time	1	9.1	24	21.8
Use of Barriers?				
Hand gloves	0	0	3	2.7
Apron	11	100.00	83	75.5
Cap	0	0	2	1.8
All	0	0	22	20.00

Table 2 Shows that hand wash before entering kitchen was practiced by all the respondents, but soap was used mostly (90.9%) by group A employees and only by 59.1% of group B employees. Habit of using soap after visiting toilets was practiced by all (100%) of group A employees and only by 69.1% of group B employees. 90.9% of category A employees trim their nails twice in a week and the rest (9.1%) after more than a weeks time.

Among category B employees 4.5% responded that they trim their nails daily, 43(39.1%), 38 (45.5%), and 24(21.8%) do so, twice a week, weekly, and more than a weeks time respectively. All (100%) of category A employees wear white aprons only during work in kitchen, whereas among category B employees 03(2.7%) use only hand Gloves (All the three are dishwashers) 83(75.5%) use only aprons, 02 (1.8%) use only caps and the rest 22(20%) wear all i.e., hand Gloves, cap and apron.

Table 3 shows the level of awareness among the food handlers. Among group A employees 09(81.1%) responded that diarrheal diseases spread by contaminated food, 9.1% responded that it spreads by ' bad air'and the rest 9.1% responded 'by

physical contact. Among group B employees only 37.3% responded the cause as 'contaminated food' whereas 24(24.25%), 12(10.9%), 30(27.3%) responded the cause as, bad air, overeating and physical contact for the spread of diarrheal infections. Group A employees (100%) had occasional/none episodes of diarrhea in the current year but 29.1% of group B employees had frequent episodes of diarrhea in the current year.

Contaminated food meant infectious agents in the food for 72.7%, blackening of food (burnt due to over heating) for 27.3% of group A employees, whereas it meant infectious agents in the food for 47.3%, blackening of food for 49.1%, and high water content in food for 3.6% of group B employees. Bacteria and ova in food can be seen with naked eye was the response of 45.5% of group A and 59.1% of group B employees. Visibly clean water is safe for drinking was the response of 18.2% of group A and 47.3% of group B employees, whereas 81.1% of group A, feel it necessary to either chlorinate or filter the visibly clean water before drinking, but only 52.7% of group B employees feel it necessary to chlorinate or filter the water to make it safe for consumption.

Table 3 Awareness

Awareness	Above 10 th Standard		Up to 10 th Standard	
	No.	%age	No.	%age
How often do you suffer from diarrhoea?				
Occasionally	11	100	78	70.90
Frequently	0	0	32	29.1
Diarrhoeal Disease spread by?				
Contaminated food	9	81.8	41	37.3
Bad air	1	9.1	27	24.5
Overeating	0	0	12	10.9
Physical contact	1	9.1	30	27.3
Bacteria and Ova can be seen with necked eye?				
False	5	45.5	65	59.1
True	6	54.5	45	40.9
Drinking water should be?				
Visibly clean	2	18.2	52	47.3
Chlorinated / Filtered	9	81.8	58	52.7

Table 4 Shows the routine practices of the two groups of employees at the work place. Only 03(27.3%) respondents of group A enter the kitchen with their shoes while the rest(72.7%) change their shoes and wear kitchen slippers in the kitchen, whereas majority (68.2%) of group B employees enter with shoes in the kitchen and the rest(31.8%) change to kitchen slippers before entering the kitchen. All(100%) of group A employees transfer cooked food with spoons from cooking utensils to service trays, whereas this practice was observed by only 74.5% of group B employees and the rest(25.5%) of group B, transfer the food with

naked hands (mostly cooked rice for sake of convenience).63.6% of category A and 78.2% of category B feel it alright to pick up the accidentally dropped food and mix it with the clean food, whereas 36.4% of category A and 21.8% of category B employees avoid to mix the dropped food with the clean food. It was responded by 45.5% of category A and 46.4% of category B employees that they never shake hands with visitors/friends during work, whereas 54.5% of group A and 44.5% of group B do so sometimes and 9.1% of group B employees feel no hesitation to do so very often.

Table 4 Routine Practices

Practices	Above 10 th Standard		Up to 10 th Standard	
	No.	%age	No.	%age
What footwear do you use in kitchen?				
Enter with shoes	3	27.3	75	68.2
Change and use kitchen slippers	8	72.7	35	31.8
How do you transfer cooked food with?				
Spoon	11	100.00	82	74.5
Naked Hands	0	0	28	25.5
Do you pickup dropped food?				
Yes	7	63.6	86	78.2
No	4	36.4	24	21.8
Do you shake hands with visitors/friends during work?				
Never	5	45.5	51	46.4
Some times	6	54.5	49	44.5
Often	0	0	10	9.1

DISCUSSION

Education is just as important as legislation in approaching the reduction of food borne disease outbreak². A study by Dag & Merdol revealed that hygiene knowledge amongst kitchen staff changes according to educational status but hygiene training eliminates their differences⁶. Unusan, in his study reported that food safety attitudes and knowledge of a person differ significantly on the basis of his/her educational background⁸. Educational standards of most of food handlers worldwide is very less as in one of the study conducted in Sanlivifa, South Eastern Anatolia only 33.6 percent of food handlers had education beyond elementary school level¹⁰. Another study reported that education qualification ranged from

74 percent with less than a high school senior certificate to 24 percent with senior certificate to only 2 percent with a post school qualification^[2]. In our study 100 percent Dish washers, 42 percent Stewards and 39 percent of cooks had educations qualification below high school level.

A high standard of personal hygiene among individuals engaged in handling, preparations and cooking of food is needed, they should be educated in the matters of clean habits and personal hygiene such as frequent and thorough hand washing⁴. Effective hand washing is an essential control measure for prevention of pathogen transmission

in food services establishments and it is the responsibility of the food handlers to wash their hands thoroughly with soap and water under all reverent circumstances². Byrd Bredbenner et.al (2007) in their study, found that the participants didn't wash their hands with soap and water after touching raw poultry and that 97 percent of the participants had low level knowledge of food safety⁵. In our study although all the employees practise hand washing before entering the kitchen, but only 59.1% of group B employees use soap in comparison to majority (90.9%) of group A employees who use soap to wash hands before entering the kitchen for work. Similarly after visiting toilets all (100%) of group A employees use soap to wash hands in comparison to group B employees who only 69.1% use soap and the rest (30.90%) use plain water only. The difference in the practice of hand wash between the two groups of employees was found statistically significant ($p < 0.05$).

Short and clean fingernails are also important for prevention of transmission of food borne illness. In our study the practice of regular trimming of finger nails was found in majority (90.9%) of group A employees, who trim their nails twice a week and the rest (9.1%) after more than a weeks time and among group B employees 43(39.1%), 38(45.5%), and 24(21.8%) trim their nails twice a week, weekly, and more than a weeks time respectively. Food handlers should also wear clean aprons, gloves, caps and hairnets at work. In one of the studies it was observed that all the respondents wore plastic or material apron, gloves and hairnet². In our study only 20% of group B employees wear apron, cap and gloves and the group A employees wear white aprons only during their work in the kitchen.

No food handler should touch ready to eat food with his or her bare hands unless doing so is unavoidable for preparation purposes but in our study 25.5% of group B employees transfer cooked food with naked hands from cooking utensils to distribution trays. Low education level leads to lack of knowledge and results in negligence that is how 68.2% of group B employees of our study enter the kitchen along with their shoes and only the minority (31.8%) wear slippers kept in the kitchen

for the purpose, whereas in comparison 72.7% of group A employees use kitchen slippers before they enter the kitchen and the difference is statistically significant ($p < 0.05$). Angelillo et.al reported that knowledge on food borne pathogens was significantly increased among workers with a higher educational level⁷. In the present study level of awareness regarding transmission of food borne infections was found higher in group A employees and that 81.8% of group A responded that diarrhoeal diseases spread by contaminated food in comparison to group B employees where the same response was given by only 37.3% of the respondents. The difference is significant ($p < 0.05$). To make it fit for drinking 81.8% of group A employees feel the need of chlorination or filtration of visibly clean water, whereas only 52.7% of group B employees feel such treatment necessary to visibly clean water.

CONCLUSION

In hospitals, on the one hand there are highly qualified & skilled manpower like Doctors and Nurses, who take utmost care to prevent hospital acquired infections being contracted by the patients who are already debilitated due to their illness. On the other hand there are less educated & unskilled manpower like food handlers, who because of their low education background and ignorance help in transmission of food borne infections. Review of various studies revealed that some authors highlight the prevalence of positive cases of stool screening; nail washing and urine cultures to identify the diseases carriers among food handlers^{9,10}. Some researchers recommend periodic health check-up of food handlers¹¹. The conclusion and the recommendation of authors of the present paper is to ensure by regulation, the employment in food industry of only those candidates, who are well educated with science background, preferably trained in hygienic food handling methods. Ministry of health can provide financial assistance to food industry for such purposes as it will prove cost effective than controlling endemic and sporadic transmission of food borne infections. Well educated employees can be given brief re-orientation sessions regarding healthy food handling practices.



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