

# Assessment of knowledge, Attitudes and Practices (KAP) among food handlers in catering units of Government and semi government hospitals.

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## ABSTRACT

This study was conducted to evaluate the level of knowledge, attitude and practices (KAP) among food handlers concerning food safety issues in hospital kitchens. Ninety workers/food handlers, who served diet to patients in the hospitals were selected from the kitchens of the dietetics departments of three hospitals namely Govt. Medical College and Hospital (GMCH) Sector 32, Chandigarh, Multi Specialty Hospital (GMSH), Sector 16, Chandigarh (government) and Dayanand Medical college and Hospital (DMCH), Ludhiana (semi-government). Thirty subjects were randomly selected from each hospital. A self designed questionnaire was used to know the incidence and KAP of subjects according to their demographic profile and Chi-square test was applied to know the differences.

Three questionnaires were used with 10 questions in each based on hygiene and sanitation, general knowledge and dietary practices and related to food safety, with multiple choice questions. The comparative responses were analyzed by calculating the percentage of positive responses by workers of each hospital. Mean scores were used to calculate the incidence of positive responses and chi-square to find statistical differences among all hospitals, stating their frequency and significance. The KAP study when related to the demographic profile of workers from all three hospitals (n=90) with regards to age showed that in 31–40 years age group 95% maximum workers responded positively to Knowledge, in > 50 years age group 98% maximum responded to Attitude and in 41-50 years age group 92% maximum responded to Practices. All other demographic profiles of all three hospitals showed equally high incidences. The Chi-square test among differences in positive responses of three hospitals showed highly significant ( $p < 0.001$ ) results for GMCH 32 Chandigarh,  $p < 0.01$  was significant in GMSH, Sector 16, Chandigarh (government) Chandigarh and  $p < 0.05$  significant by DMCH Ludhiana.

**Key words:** food safety, hospital kitchens, food handlers, knowledge, aptitude, practices

## INTRODUCTION

Knowledge, attitude and practice survey is usually conducted to know the awareness of the participants on particular topics, the recommendations of which are then used in training programs. These studies have become important especially in food related units.

Such studies will increase knowledge and awareness of the food handlers about potential food hazards and related food safety problems and help hospitals to develop, implement and maintain an effective food safety management system and can help policy and decision makers to create and implement the recommendations. It can help in safe guarding the health of the nation and the reduction of healthcare costs.

Food-borne diseases are playing havoc in hospitals and need to be curbed. Hospitals have been identified as high food safety risk institutions because they serve potentially hazardous foods to vulnerable people<sup>1</sup>. Recently many studies pin point the need for training and education of food handlers because of their lack of knowledge on microbiological food hazards, temperature ranges of refrigerators, cross contamination and personal hygiene<sup>2</sup>. A FAO/WHO joint Expert Committee on Food Safety concluded as early as 1983 that “illness due to contaminated food is perhaps the most widespread health problem in the contemporary world”<sup>3</sup>. Data published since then by various countries confirm this statement and indicate that the problem has been on increase<sup>4</sup>. The issue of food safety in healthcare facilities poses a great challenge as potential risks of hospital food from preparation to the patient’s tray are countless. In fact food may be prepared or brought in by catering service providers in hefty quantities and served to a large number of patients by many hands<sup>5</sup>.

The hands of food service employees can be vectors in the spread of food borne diseases because of poor personal hygiene and food handling practices<sup>6</sup>. Very few studies have been conducted to explore the food safety knowledge and practices of food handlers<sup>7</sup>.

Food is a product that is rich in nutrients required by various organisms and humans but may be exposed to contamination with water, air, dust equipments, sewage, insects, rodents and hospital kitchen employees.

Despite better changes in food production, handling and preparation techniques as well as clean eating habits, food is still the source of micro organisms that can cause illness. The common food handling mistakes besides serving contaminated raw food, includes inadequate cooking, heating or reheating of foods, consumption of food from unsafe sources, cooking food inappropriately and allowing too much of time lap and bacteriological contamination during cold storage. Also symptomatic illness of food handlers can play a major role in spreading disease among patients. The studies on KAP of food safety from research abroad are plenty<sup>1-14</sup> but very few studies can be found from India. Hence this paper presents a survey that assessed the Knowledge, Attitudes and Practices (KAP) according to demographic profile of food handlers regarding hygiene and sanitation, dietary practices and food safety at three hospitals in a developing country like India.

**AIMS and objectives**

1. To assess the prevailing food safety Knowledge, Attitudes and Practices of food handlers in hospital kitchens.
2. To identify the weak points and modify the training schedule in hospital Catering units and to take necessary steps for food handlers to improve their working skills with regard to KAP.
3. To provide a improved methods by implementing latest rules of Hazard Analysis and Critical Control Point (HACCP) System and Food safety and standards authority of India (FSSAI) rules in hospital food services.

**Material and methods**

**Research design:** A questionnaire based survey was carried out to evaluate the KAP according to demographic profile of hospital kitchen food handlers and responses regarding hygiene and sanitation, general knowledge and dietary practices related to food safety in three different hospitals i.e Govt. Medical College and Hospital, Sector 32 Chandigarh (GMCH) , Government Multi Specialty Hospital, Sector 16, Chandigarh (GMSH) and Dayanand Medical College and Hospital ,Ludhiana (DMCH--- semi government from January to December 2018 was obtained for each hospital separately. Incidence of food handlers according to demographic profile and Chi-square test was applied to find differences of KAP according to demographic profile.

A total of ninety male kitchen workers/food handlers were selected randomly as subjects for the survey. The sample size was thirty from each hospital i.e. Total 90 subjects. They were apprised about the survey and assurance was given that the responses will be confidential and in no way this will jeopardize the career of the workers. Each kitchen worker was interviewed.

**Tool:** Nine questions were related with demographic characteristics of food handlers (education level, age, gender, number of years staff in foodservice operations, food safety training etc. Questionnaire for food handlers included 30 questions each with multiple answers. To reduce the response bias, the multiple choice answers included 'others'. The score range was between 0 and 30. The scores were converted to 100 points. The score below 50% of food safety knowledge questionnaire is accepted as poor knowledge.

**statistical analysis :**The responses of all the three hospitals were combined and percentages were calculated according to all demographic profiles. Incidence of KAP according to demographic profile was calculated .Incidence of KAP of hygiene and sanitation, general knowledge and dietary practices related to food was obtained for each hospital.

Statistical analyses were conducted using SPSS (12.0 statistical package). Chi-square test was applied to find incidence and difference of KAP of food handlers according to demographic profile The differences between the KAP among the food handlers of three hospitals was determined by Chi- sq test according to the demographic profile. .Chi-square test was applied to find incidence and difference of KAP of food handlers according to demographic profile.

**RESULTS AND DISCUSSION**

Table 1 : Incidence of food handlers according to demographic characteristics.(%) (n=90)

Characteristic	Demographic characteristics
1. Age group	<20 21-30 31-40 41-50 >50
2. Gender	Male
3. Race	South Indian Punjabi Himachali Others
4. Education level	No formal education Primary school Secondary school Others
5. Designation	Chef Dishwasher Cutter Server Others
6. Working experience	< 1 year 1-5 years 6-10 years 11-20 years > 20 years

Medical done	YES NO
8.Training course attended	Yes No
9.Typhim Vi injection	Yes No

The incidence of socio economic and demographic data of respondents is given below:

Majority (61.1%) were South Indians, others were North Indian Punjabi (32.2%), North Indian Himachali (1.1%) and others (1.6%). Youngest workers >20 years (2.2%) and eldest were aged >50 years (3.3%). The medical checkup of these food handlers was got done by the contractor. This was mandatory in the tender document when they had applied for job. 68.9% had their medical done and 72.2% had their immunization.

Highest Education level of respondents was secondary school (47.8%) and (8.9%) were without formal education. 7.8% respondents had less than 1 year of working experience and 1.1% had more than 20 years of experience. The employees' response to the survey has been evaluated according to the designation. It has been found that 5.6% of them were chef and assistant cooks. 14.4% of the staff was responsible for the service and played both the role in hospital patient catering and in official catering. Chi-square test values for incidences were statistically significant ( $p < 0.05$ ).

Table II KAP of subjects according to demographic profile (n=90)

### 1. Age

Table 1a: Percentage of positive responses on KAP based on age groups

Aspect	<20 (%)	21-30 (%)	31-40 (%)	41-50 (%)	>50 (%)
Knowledge	90	60	95	72	88
Attitude	90	76	70	85	98
Practice	90	82	84	92	88

Chi sq--- 22.0\* $P < 0.05$ —statistically significant results

### 2. Gender

Table 1b. Percentage of positive responses of KAP of males

Aspect	Male (%)
Knowledge	57 (%)
Attitude	60 (%)
Practice	60 (%)

### 3. Race

Table 1c. Percentage of positive responses of KAP based on Race

Aspect	South Indian (%)	Punjabi (%)	Himachali (%)	Others (%)
Knowledge	89	85	88	77
Attitude	85	96	75	72
Practice	86	87	66	89

Chi sq—18.5, \* $P < 0.05$  statistically significant

#### 4. Educational level

**Table 1d . Percentage of positive responses of KAP based on Educational level.**

Aspect	No formal education (%)	Primary school (%)	Secondary school (%)	Others (%)
Knowledge	69	75	78	77
Attitude	65	76	75	72
Practice	66	77	76	79

Chi sq---18.5\*P< 0.05—statistically significant results

#### 5.Designation

**Table 1e . Percentage of positive responses of KAP based on Employees level**

Aspect	Chef (%)	Dish-washer (%)	Cutter (%)	Server (%)	Others (%)
Knowledge	90	75	98	77	78
Attitude	95	66	85	82	88
Practice	96	72	86	90	86

Chi sq—22.0

\*P< 0.05—means significant results

#### 6. Work experience

**Table 1f: Percentage of positive responses on KAP based on work experience (years)**

Aspect	>1 (%)	1-5 (%)	6-10y (%)	11-20y(%)	> 20y (%)
Knowledge	60	70	95	70	88
Attitude	50	76	75	82	98
Practice	66	82	84	92	88

Chi sq—22.0

\*P< 0.05—statistically significant

y- year

#### 7.Trained workers

**Table 1g .Percentage of positive responses of KAP based on training.**

Aspect	Trained (%)	Untrained (%)	Differences (%)
Knowledge	97	50	47
Attitude	90	40	50
Practice	90	62	28

Table III Comparative positive responses of food handlers of three hospitals on the three questionnaires given

Q1. Measures kept in mind while entering in the kitchen:	GMCH 32 CHD (n=30)	GMSH 16 CHD (n=30)	DMCH LUDHIANA (n=30)
1. Wash Hands	30(100%)	15(50%)	23(32%)
2. Wear head covers	28(93%)	24(80%)	30(100%)
3. Wear apron	28(93%)	22(73%)	30(100%)
4. wear gloves	28(93%)	16(53%)	19(63%)
Q2. Personal hygienic measure:			
1. Cut nails	15(50%)	23(32%)	12(40%)
2. Short hair	15(50%)	17(57%)	22(73%)
3. Cleanliness of food	30(100%)	15(50%)	13(43%)
Q3. Material used for hand wash:			
1. Soap	30(100%)	14(47%)	15 (50%)
2. Detergent	5(17%)	02(7%)	13 (43%)
3. Others	10(33%)	26(87%)	02 (7%)
Q4. How many times you wash your hands:			
1- More-than 3 times	30(100%)	3(10%)	12(40%)
2. .less than 3	15(50%)	10(33%)	22(73%)
Q5. Hygiene and maintenance in washroom.			
1. 1 –yes	30(100%)	23(32%)	23(32%)
2. No	00	-	-
Q6. Measure for pest control in the Kitchen:			
1. Fly killers	15(50%)	13(43%)	14(47%)
2. Spraying	25(83%)	2(7%)	23(32%)
Q7. Used of material for cleaning utensils?			
1. 1-Detergents	15(50%)	23(32%)	12(40%)
ther	25(83%)	13(43%)	12(40%)
Q8. Methods for removal of wastes for kitchen			
1. Dustbin	30(100%)	23(32%)	29(96%)
2. carry bag	15(50%)	12(40%)	14(47%)
Q9. Wash vegetables for salad			
1. Yes	30(100%)	13(43%)	27(90%)
2. No.	-	06(20%)	02(7%)
Q10. Do you cover the prepare food			
1. Yes	30(100%)	30(100%)	15(50%)
2. No.	-	-	

Table 1: hygiene and sanitation

**Table II: General Knowledge**

Q1. Utensils in which the food is cooked:			
1. All (Karahi, Patila, Frying pans, Cookers)	30(100%)	30 (100%)	30 (100%)
Q2. Supplements given to the patients for low protein :			
1. Biscuits	20(67%)	10 (33%)	23(77%)
2. Bread Mishti	11(37%)	15 (50%)	24(80%)
3. Sabudana Kheer	09(30%)	15 (50%)	27(90%)
Q3. Place to store vegetables:			
1. Cold storage	30(100%)	30 (100%)	24(80%)
Q4. Do you smoke :			
1. Yes	09(30%)	15 (50%)	20(67%)
2. No.	21(70%)	25 (83%)	23(77%)
Q5. How many time do you smoke			
1. 1-2-3 times	10(33%)	5(17%)	12(40%)
2. 2-5-6 times	10(33%)	5(17%)	09(30%)
3. 3-7-8 times	10(33%)	6(20%)	10(33%)
Q6. Products that are refrigerated :			
1. paneer, milk	21(70%)	20 (67%)	23(77%)
2. Paneer Milk and Others	24(80%)	30 (100%)	14(47%)
3. Veg, drinks, others	15(50%)	15 (50%)	12(40%)
Q7. Is there a exhaust system			
1. Yes	30(100%)	30 (100%)	25(83%)
2. No.	-	-	
Q8. Is there fire extinguisher in the kitchen			
1. Yes	30(100%)	30 (100%)	30 (100%)
2. No.	-	-	
Q9. Do you carry food at home:			
1. Yes	--	15 (50%)	12(40%)
2. No.	30(100%)	15 (50%)	13(43%)
Q10. Is the equipment modern:			
1. Yes	29(97%)	30 (100%)	22(73%)
2. No.	01(3%)	02(7%)	03(10%)



Table III: Dietary Practices

Q1. Different cooking methods used in the kitchen:			
1. All	30(100%)	30(100%)	30(100%)
Q2. Quality of products used in kitchen :			
1. Best	30(100%)	23(77%)	22(73%)
2. Good	15(50%)	20(67%)	20(67%)
Q3. Supply of hot water in the kitchen :			
1. Yes	30(100%)	25(83%)	25(83%)
2. No.	-		
Q4. Hygienic of feeds supplied to the patients :			
1. Tupperware	29(97%)	12(40%)	11(37%)
2. Flask	30(100%)	10(33%)	20(67%)
wrapped food	30(100%)	22(73%)	-
Q5. Where do you take meal during working hours.			
1. Outside the kitchen	30(100%)	25(83%)	20(67%)
2. inside	15(50%)	12(40%)	12(40%)
Q6. Brand of spices in cooking :			
1. Others (made by themselves)	15(50%)	12(40%)	14(47%)
2. Catch MDH	30(100%)	25(83%)	24(80%)
Q7. Types of diets prepared in Kitchen			
1. Diabetic/renal/salt/normal	15(50%)	12(40%)	12(40%)
All	15(15%)	23(77%)	14(47%)
Q8. Use of peeler for peel off:			
1. Yes	15(15%)	14(47%)	13(43%)
2. No.	25(83%)	28(93%)	12(40%)
Q9. How do you knead atta/flour :			
1. Machine	24(80%)	22(73%)	12(40%)
2. By hand	26(87%)	29(97%)	22(73%)
Q10. Brands of oil used :			
1. Refined oil	27(90%)	28(93%)	28(93%)
2. Others	23(77%)	22(73%)	23(77%)
3. Coconut oil	09(30%)	12(40%)	10(33%)

The Chi square test among differences in response in all three categories of questionnaires showed positive responses ( $p < 0.001$ ) highly significant results for GMCH, 32, Chandigarh,  $p < 0.01$  (significant) GMSH 16 Chandigarh and ( $p < 0.05$ ) significant by DMCH Ludhiana.

The KAP study when related to the demographic profile of workers from all three hospitals ( $n=90$ ) with regards to age showed that (table 1a) in 31—40 years age group 95% maximum workers responded positively to Knowledge in  $> 50$  years age group 98% maximum responded to Attitude and in 41-50 years age group 92% maximum responded to Practices (Chi sq-22.0) which was significant ( $p < 0.05$ ). Similarly KAP of food handlers was observed with other demographic factors and Chi- square showed significant level ( $p < 0.05$ ).

Comparing the three hospitals for hygiene and sanitation, general knowledge and dietary practices done by adding all positive responses showed good knowledge on hygiene and sanitation (range—32-100%), general knowledge (range—17—100%) and dietary practices (range—37-100%).

However some observational studies found that although the food handlers have good knowledge towards food safety, they do not always put the knowledge in practice.<sup>8</sup> Another study<sup>9</sup> reports that 81% them are aware of importance of hand washing but only 2 % observe washing thoroughly. Even small injuries should not be overlooked. KAP model<sup>10</sup>. This approach assumes that an individuals behaviour or practice (P) is dependent on their knowledge (K) and suggests that the mere provision of information will lead directly to a change in

attitude (A) and consequently a change in behaviour. It has been suggested that this model is flawed in its assumption that knowledge is the main precursor to behavioural change<sup>11</sup>. Attitudes, an important factor besides knowledge and enforcement, ensure a downward trend of foodborne illnesses. The necessary link of positive behaviour, attitudes and continued education of food handlers towards the sustainability of safe food handling practices has been highlighted<sup>12</sup>. Foods vary in composition, so no single cooking temperature is going to give the culinary quality desired and the safety needed for all food; There are various combinations of time and temperatures needed to inactivate pathogenic vegetative bacteria<sup>13</sup>. Since temperature treatment is frequently the critical control point a production process, the issue of poor temperature understanding could be a major hindrance of effective HACCP implementation<sup>14</sup>. In this study, there was lack of knowledge among the food handlers about the critical temperatures of hot or cold ready-to-eat foods, acceptable refrigerator temperature ranges, and cross-contamination.

It is highly desirable to identify good terms and policies and staff of this institute regularly attended the meetings with the head of the Dietetics deptt every month. They were trained by showing slides on hygiene and sanitation in the kitchen and also by giving lectures on the dietary and hygiene practices.

## CONCLUSIONS

The objective of this research was to analyze data from three hospitals in Government and semi Government spheres to determine the knowledge, aptitude and practices of the food handlers in the hospital kitchen. The assessment and observation checklist has uncovered some gaps regarding the status of the premises, status and storage of equipments, some aspects of personal hygiene and sanitation and pest control. From the study we formed various guidelines for providing better health care to the patients in the hospitals through our hospital kitchens.

## RECOMMENDATIONS

Although based on limited data there is a need for broader scale evaluations in order to develop design guidance. There is also need of more studies that investigate that what impact hospital management has by training their kitchen workers. Also consideration should be given to a personnel training programme that could be used to educate employees on KAP.

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