

## Assessment of Awareness about Keys of Safer Food among Local Food Venders and Cafeteria Staff in Tertiary Care Center in Pandemic: A Cross Sectional Study

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### Abstract

**Background:** Food borne diseases, usually either infectious or toxic in nature. Agents that enter the body through ingestion of food pose global health threats, endangering everyone with an underlying illness which is particularly vulnerable.

**Objective:** To assess the awareness of safe food among campus cafeterias staff and local food venders in the campus of tertiary care center in pandemic situation.

**Methodology:** A cross-sectional study conducted among 237 study subjects those who were presently working; interviewed by using predesigned and pre-tested modified WHO proforma.

**Result:** Overall awareness was higher in cafeteria staff as compared to local food venders in tertiary care Centre. According to the positive awareness about death occur due to food borne diseases; 19 (24.4%) cafeteria staff had lower awareness compared to local food venders i.e. 110 (69.2%) with extremely significant [chi sq; 13.9] with p-value ( $p < 0.001$ ). Whereas, keeping raw and cooked food separately prevents cross-contamination; 48 (61.5%) cafeteria staff had higher awareness [chi sq; 8.12] with p-value ( $p=0.029$ ). While awareness about whether it is good to wipe fruits and salads before eating than rinse into running water; 62 (79.5%) cafeteria staff had higher awareness [chi sq; 7.03] with p-value ( $p=0.001$ ) compared to local food venders.

**Conclusion:** The lack of awareness regarding safe food was being served as potential risk in our tertiary care center among local food venders. There is an urgent need of training programme for cafeteria staff in tertiary care center.

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## Introduction

Globally, millions fall ill from food borne disease (FBDs) and billions of people are at risk every year. Many die due to consuming unsafe food, which leads to affect economic development through the tourism, agricultural and food export industries. The second highest burden of FBDs is in South-East Asian region after the African Region, with more than 150 million cases and 175 000 deaths annually [1].

In the midst of enormous world turmoil about the coronavirus COVID-19 and where it might take the world from all the types of perspectives that one could think of. This turmoil should not leave us as problem solvers, future foresight experts, socio-economic researchers and scientists empty-handed, watching and praying for solutions that could come only from social distancing, isolation or from the research of the drug companies that are competing to offer the best vaccine [2]. Studies on Coronaviruses shows that they need a host (animal or human) to grow. Safe hygiene and reliable public health practices and control are expected to strain such viruses. And since these viruses are going to be always present and around humans need to build innovative public health systems that could start with 'Intelligent Inspection' in relevant to animal farms, animal market and animal consumption [3].

In 2005 alone, 1.8 million people died from diarrheal disorders, and most of these cases were attributed to the ingestion of contaminated food and drinking water according to the World Health Organization (WHO), [4].

The uniqueness of the COVID-19 pandemic that it perceived to have started with a virus transmittance from animals or animals' food to humans and became a life-threatening outbreak [3]. Agents that enter the body through ingestion of food which is either infectious or toxic in nature which leads to these disorders. Unsafe food

containing harmful bacteria, viruses, parasites or chemical substances, causes more than 200 diseases ranging from diarrhea to cancers. Food borne and waterborne diarrheal diseases kill an estimated 2 million people annually, including many children [4].

The characteristics of food-borne viruses is that it leads to the incidences of the known viral diseases and also investigates the role expected from the public health authorities in relevance to monitoring the animals and food handling, the decontamination procedures, and the dangers that might come from infected people before, during or after food handling [5].

Unsafe food poses global health threats, endangering everyone. Infants, young children, pregnant women, the elderly and those with an underlying illness are particularly vulnerable [6].

Significant progress had been made toward decreasing food borne illnesses caused by key pathogens, except Salmonella according to Food Net, the United States' food safety report card, [6]. This decline is good news, but this rate is still higher than Healthy People 2020 goals [7].

India, being a culturally and socially diverse nation in the food industry, staffs from various part of the country come to the tertiary centre leaves their homes for good work profile from bigger towns which also make differences in food safety practices. Therefore, in this background an attempt was made to study with an objective to assess the awareness about keys of safer food practices among non-teaching and teaching staff of tertiary care center.

## Material and Methods

### Research design and location

A cross-sectional Interview based study conducted in the Amaltas Institute of Medical Sciences, Dewas M.P, Central India.

The study subjects were local food venders in the campus of medical college and hospital and cafeterias staff working in college and hospital territory on their duty hours from 9:00 am to 4:00 pm in the period of 1<sup>st</sup> week of September 2021 on a National Nutritional week.

### Targeted Population, Setting and Instruments for getting Information

A total of 237 study subjects who were present on their day time duties were selected and interviewed for this study. The data collection tool used for the study was predesigned and pre-tested modified world health day pro-forma<sup>6</sup> containing question related the information on socio demographic status such as (age, gender, education) and awareness of safe food was used. The pro-forma consists of 6 questions. All questions about awareness were in dichotomous pattern such as true response or false response.

The non-teaching staffs of department of community medicine were enrolled from medical college at tertiary care center that were trained and oriented regarding the study, collected the data by giving the questionnaire to each study participants for self-assessment, whereas study participant who were illiterate and unable to read English were interviewed in convenient

languages. Investigator selected and interviewed only those participants who came forward at the time of survey and kept appropriate distance between one participant then other due Corona pandemic as well as due to assess correct awareness on same particular time. Investigators clearly stated to the study subjects that the information will be used only for scientific purposes and verbal and written consent was taken from all the study subjects.

### Data Analysis

A variable file was created on MS Office Excel 2010. Graph-pad software was used for analyzing the data. The descriptive statistics were performed for each question was expressed in percentage basis. The Chi-square test was applied with the p-value of less than 0.05 considered as significant.

### Result

**Table 1:** Represents socio- demographic status of 237 study subjects who participated, at the time of survey. According to age in complete years; majority of study population i.e. cafeteria staff were in age group of (31 – 45) years i.e. 27 (34.6%) and local venders at the age group (31 – 45) years i.e. 51 (37.6%).

**Table 1: Socio-demographic status of study subjects**

Variables	Cafeteria Staff n (%)	Local food venders n (%)	Total n (%)
<b>Age (complete years)</b>			
15 – 30	10 (12.9)	18 (11.3)	28 (11.8)
31 – 45	27 (34.6)	51 (32.1)	78 (32.9)
46 – 60	20 (25.6)	43 (27.0)	63 (26.6)
> 60	21 (29.9)	47 (29.6)	68 (28.7)
<b>Gender</b>			
Male	56 (78.8)	113 (71.1)	169 (71.3)
Female	22 (28.2)	46 (28.9)	68 (28.7)
<b>Education</b>			
Intermediate/ Diploma	12 (15.4)	37 (23.3)	49 (20.7)
Higher Secondary	38 (48.7)	34 (21.4)	72 (30.4)
Middle School	13 (16.7)	14 (8.8)	27 (11.4)
Primary School	11 (14.1)	64 (40.2)	75 (31.6)

Illiterate	4 (5.1)	10 (6.3)	14 (5.9)
<b>Total</b>	78 (100.0)	159 (100.0)	237(100.0)

According to gender; majority of the staff were male 169 (71.3%). According to the education status 38 (48.7%) of cafeteria staff were studied till higher secondary and

majority of local food venders studied in primary school 75 (31.6%) in the present study respectively.

**Table 2: Distribution of study subject as cafeteria staffs for awareness about safe food**

Awareness about safe food	True	False
Is Death occur due to food borne diseases	19 (24.4)	59 (75.6)
Is food is safe to eat, if it smells ok & look good	51 (65.4)	27 (34.6)
Is some microorganism is good for making food	41 (52.6)	37 (47.4)
Keeping raw and cooked food separate prevent cross-contamination	48 (61.5)	30 (38.5)
Is Re-Heat food thoroughly good for health	59 (75.6)	19 (24.4)
Is wiping fruits & salads before eating is good	62 (79.5)	16 (20.5)

**Table 2:** Represents the cafeteria staff's positive awareness about safe food; found that majority of the staff answered correctly i.e. 62 (79.5%) that wiping fruits and salad before eating is good, followed by 59 (75.6%) answered that re-heat food thoroughly is good for health. Whereas, 51 (65.4%) correctly answered food is safe to eat, if it smells ok and look good. 48 (61.5%) answered Keeping raw and

cooked food separate prevent cross-contamination can be avoided by separating the raw from cooked food, followed by 41 (52.6%) some microorganism is good for making food. While, less than half of the staff i.e. 19 (24.4%) answered correctly that Death do occur due to food borne disease while consuming unhealthy food in the study respectively.

**Table 3: Distribution of study subjects as local food venders for awareness about safe food**

Awareness about safe food	True	False
Is Death occur due to food borne diseases	110 (69.2)	49 (30.8)
Is food is safe to eat, if it smells ok & look good	107 (67.3)	32 (32.7)
Is some microorganism is good for making food	90 (56.6)	69 (43.4)
Keeping raw and cooked food separate prevent cross-contamination	74 (46.5)	85 (53.5)
Is Re-Heat food thoroughly good for health	119 (74.8)	40 (25.2)
Is wiping fruits & salads before eating is good	40 (25.2)	119 (74.8)

Table 3: Represents the local food vender's positive awareness about safe food; found that majority of the participants answered correctly i.e. 110 (69.2%) answered that death do occur due to food borne diseases, followed by 119 (74.8%) answered re-heat food thoroughly

is good for the health, followed by 107 (67.3%) participants answered that food is not always safe to eat, if it smells ok and looks good. Whereas, 90 (56.6%) answered that some microorganisms were required for making food products.

While, less than half of the food venders i.e. 74 (46.5%) answered cross contamination can be avoided by separating the raw from cooked food,

followed 40 (25.2%) participants answered that they are rinsing by tape water then wiping raw fruits and vegetable while consuming it in the study respectively.

**Table 4: Distribution of study subjects according to positive awareness about safe food among Cafeteria staff and local food venders**

Awareness about safe food	Cafeteria Staff	Local Food Venders	Total	Chi Sq	p-Value
Is Death occur due to food borne diseases	19 (24.4)	110 (69.2)	129 (54.4)	42.3	0.001**
Is food is safe to eat, if it smells ok & look good	51 (65.4)	107 (67.3)	158 (66.7)	0.08	0.769
Is some microorganism is good for making food	41 (52.6)	90 (56.6)	131 (55.3)	0.34	0.556
Keeping raw and cooked food separate prevent cross-contamination	48 (61.5)	74 (46.5)	122 (51.5)	4.71	0.029*
Is Re-Heat food thoroughly good for health	59 (75.6)	119 (74.8)	178 (75.1)	0.01	0.893
Is wiping fruits & salads before eating is good	62 (79.5)	40 (25.2)	102 (16.9)	63.0	0.001**

\*\* : Extremely significant at p-value (< 0.001);\* : Significant at p-value (<0.05)

**Table 4:** Represents the positive awareness among cafeteria staff and local food venders; it was found that overall awareness was higher in cafeteria staff as compared to local food venders in tertiary care Centre. According to the positive awareness about death occur due to food borne diseases; 19 (24.4%) cafeteria staff had lower awareness compared to local food venders i.e. 110 (69.2%). However, after applying test of significance; it was found to be extremely significant [chi sq; 13.9] with p-value (p < 0.001).

Similarly according to positive awareness that keeping raw and cooked food separately prevents cross-contamination; 48 (61.5%) cafeteria staff had higher awareness compared to local food venders i.e. 74 (46.5%), however after applying test of significance; it was found to be significant [chi sq; 8.12] with p-value (p=0.029).

While according to positive awareness about whether it is good to wipe fruits and salads before eating than rinse into running water; 62 (79.5%) cafeteria staff had higher awareness compared to local food venders i.e. 40 (25.2%), however after applying test of significance; it was found to be significant [chi sq; 7.03] with p-value (p=0.001).

### Discussion

In general, 54.4% Study subjects demonstrated good awareness in the categories such as food borne diseases can cause death followed by 55.3% were aware that there are some micro-organisms which were helpful for making good food and 51.5% were aware about how they prevent cross contamination to avoiding raw and cooked food separately, whereas majority of the study subjects 75.1% were also aware about re-heat food thoroughly is good for health and more than half i.e. 66.7% were also aware about not always

food is safe to eat, if it smells OK and looks good. Similar study [7] was conducted among 124 food handlers in 32 school canteens in Portugal, found that the food handlers displayed reasonable level of knowledge in personal hygiene and cross contamination, but fared worse in other areas.

The level of awareness in our study was influenced by education of the study subjects. Similar study conducted in tertiary care hospital of Tamil Nadu, India they found low education level influenced the knowledge of food borne diseases in their study 8. On the other hand, other studies showed that their study subjects had low level of knowledge about food hygiene issues. In a study that was performed in small and micro enterprises, to assess food handlers' knowledge on food hygiene (n = 159), in South Africa, the average percentage of correct answers was 46.0% [9] and in another study in Ankara, Turkey, the mean food safety knowledge score of food handlers (n = 764) was 43.4% ± 16.3% [10].

In our study 75.1% study subjects re-heat the kept food thoroughly until food is piping out hot thoroughly; similar study from Dubai [11] shows only 30.1 participants re-heat. These are crucial step to prevent cross-contamination of food.

In our study 33.3% still unaware of the fact that food which always looks good is not always safe to eaten similar study was conducted among (n=444) food handlers, employed in 104 small food businesses where 57.0% food handlers wrongly believed that they can tell by sight, smell and taste weather the food is ok or contaminated with food poisoning bacteria [12].

Our study showed satisfactory knowledge 47.8% of refrigerator's control, but there are studies with both good knowledge [13] and lack of knowledge [12, 14] regarding temperature control measure to reduce the risk of food poisoning.

## Conclusion

There is an urgent need of training programme in the campus for cafeteria staff and local food venders of the tertiary care Centre for protecting their own self from being ill from controllable food spoiling pathogens in pandemic. The lack of awareness regarding safe food was being served as potential risk in our tertiary care center. The results of this study may help in identifying proper and suitable methods for planning health education programs to improve their knowledge, attitudes, and practices.

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## References

1. World Health Organization. Food Safety [Internet]. 2014 [cited 12 February 2018]. Available from: <http://www.who.int/mediacentre/factsheets/fs399/en/>
2. McKinney KR, Gong YY, Lewis TG. Environmental transmission of SARS at Amoy Gardens. *J Environ Health*; 2006;68(9): 26-30.
3. Mohamed Buheji, Stopping Future COVID-19 Like Pandemics from the Source- A Socio-Economic Perspective 'Re-inventing Zoonotic Virus Foodborne Diseases Inspection', *American Journal of Economics*, 2020;10(03):115-125.
4. World Health Organization. Food safety and food-borne illness. 2007: Fact sheet No. 23. Available at <http://www.who.int/mediacentre/factsheets/fs237/en/>
5. EFSA. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2012. European

- Food Safety Authority Journal; 2014;12:1–312.
6. World Health Organization. Food safety and food-borne illness. 2007: Fact sheet No. 23. Available at <http://www.who.int/mediacentre/factsheets/fs237/en/>
  7. M. J. Santos, J. R Nogueira, L. Patarata and O. Mayan, “Knowledge Levels of Food Handlers in Portuguese School Canteens and Their Self-Reported Behavior to-wards Food Safety,” International Journal of Environmental Health Research, 2008;18(06):387- 401.
  8. Anuradha M, Dandekar R. Knowledge, Attitude and Practice among food handlers on food borne diseases: A hospital-based study in tertiary care hospital. Int J of Biomed & Adv Res [Internet]. 2014; 5(4):196. Available from: <http://www.ssjournals.com/index.php/ijbar/article/viewFile/491/489>
  9. M. Marais, N. Conradie and D. Labadarios, Small and Micro Enterprises- Aspects of Knowledge, Attitudes and Practices of Managers’ Hospital, Western Cape, South African Journal Clinical Nutrition, 2007;20(2) 50-61.
  10. F. P. Çakiroglu and A. Uçar, Employees’ Perception of Hygiene in the Catering Industry in Ankara (Turkey), Food Control,2008;19(1):9-15.
  11. Al Suwaidi A, Hussein H, Al Faisal W, El Sawaf E, Wasfy A. Hygienic Practices Among Food Handlers in Dubai. International Journal of Preventive Medicine Research [Internet]. 2012; 1(3):101-108.
  12. Walker E, Pritchard C, Forsythe S. Food handler’s hygiene knowledge in small food businesses. Food Control [Internet]. 2003; 14(5):339-343.
  13. Sharif L, Obaidat M, Al-Dalalah M. Food Hygiene Knowledge, Attitudes and Practices of the Food Handlers in the Military Hospitals. FNS [Internet]005D. 2013;04(03):245-251.
  14. Buccheri C, Casuccio A, Giammanco S, Giammanco M, La Guardia M, Mammina C. Food safety in hospital: knowledge, attitudes and practices of nursing staff of two hospitals in Sicily, Italy. BMC Health Services Research [Internet].2007; 7(1):45.