

ANALYSIS ON THE INDIVIDUAL PERSPECTIVE ON THE FLARE UP OF FOOD POISONING AMONG HOSTEL STUDENTS - A SURVEY

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Running title: A survey on individual opinion about food poisoning among hostel students and its variable causes.

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ABSTRACT:

Introduction: Diseases are of two types based on the etiological agents- food borne poisoning and food borne infections. Food poisoning is caused mainly due to Poisonous chemicals or other toxic substances present in food. Ingestion of contaminated drink or food with toxins or bacteria or chemical substances causes acute gastritis. The main problems faced by the students residing in hostels are quality of the food served, sanitation and cleanliness of the hostel, pure water supply and first aid facilities in case of need. Food directly impacts the health of the student and unsanitary food causes a negative outlook of the student which in turn impacts the students desire to stay in the hostel. Potentially risky procedures include preservation of leftovers in an unsanitary environment, reheating of food in a possible unsafe way and food preparation with unprotected wounds on their hands. Student education regarding food poisoning needs to be in focus in an effort to decrease diseases which are food borne.

Methodology: A questionnaire-based study was conducted on 100 students residing in hostels throughout Chennai. The results were calculated by descriptive statistical analysis. The questionnaire contained 20 questions based both generally and on the symptoms of the disease.

Results and conclusion: Our survey towards the knowledge on food poisoning in hostels across Chennai, concluded that Food poisoning among hostellers is common around 69% and the incidence of food poisoning is reduced when the duration of stay in hostel exceeds 2 years. Also we found that it is very common in places where food is prepared in bulk. Whenever there is any compromise on the sanitation of food and cleanliness there can be an outbreak of food poisoning. Only appropriate awareness on this topic can influence the reduction in future food poisoning cases.

Keywords: Diseases, Food Poisoning, Hostel Lifestyle, Infections.

INTRODUCTION

Food borne diseases are generally diseases of infectious or toxic nature which are caused or presumed to be caused by intake of infected food or water. Diseases are of two types based on the etiological agents- food borne poisoning and food borne infections. Food poisoning is caused mainly due to Poisonous chemicals or other toxic substances present in food and infections are caused by bacterial agents like *Staphylococcus aureus*. But these terms are used interchangeably.(Le Loir et al., 2003) It has been estimated that foodborne diseases result in 325,000 hospitalizations and 5,000 deaths each year in the USA. (Mohd Yusof et al., 2018) (Mead et al., 1999) Food poisoning is an acute gastroenteritis caused by ingestion of food or drink contaminated with either residing bacteria or their toxins or inorganic chemical substances and poisons derived from living organisms including animals and plants.(Ajmal, 2015) It normally occurs as explosive outbreaks, affecting a massive number of humans at the same time, with a collection of signs, symptoms and records of a common exposure such as food. (Khozaei et al., 2010)The housefly has been seen as a vector of meals poisoning bacteria on many occasions. Classical epidemics of meals-borne infections including of the typhoid epidemics amongst soldiers at some point of the Boer and Spanish-American wars, each of which involved more than 20,000 cases and the significant cases of diarrhea in Southend-on-Sea in 1901 had been traced to the contamination of food by flies.(Ostrolenk and Welch, 1942) Cockroaches have also been established as vectors of food poisoning. In an experiment, mice have been readily infected when exposed to the infected fecal matter of *P. americana* and also cross infections seemed to have occurred amongst infected and uninfected cockroaches.(Rueger and Olson, 1969)

The word hostel generally means an accommodation for travelers or students to stay when they are away from home generally in order to pursue a formal education. Living away from family creates some experience for the student which teaches him/her independence and ability to compromise with other students and roommates.(Yadav and Iqbal, 2009) Social lifestyles studies enable people to switch the knowledge, stories and values to their personal abilities. These personal competencies are the only of the individual personality. So, the personal characteristics are shaped through the social publicity and characteristic capacity of studying the outside world. Life experiences are the skills that educate man or woman to behave as it should be to the situation.(Memon et al., 2018) The main problems faced by the students residing in hostels are

quality of the food served, sanitation and cleanliness of the hostel, pure water supply and first aid facilities in case of need. The primary demand of all students is sanitary and clean food for consumption. Food directly impacts the health of the student and unsanitary food causes a negative outlook of the student which in turn impacts the students desire to stay in the hostel. Good food keeps the student healthy and able to concentrate well.(Bhalwar, 2020) In Malaysia an incidence of 9.6/100,000 had been reported in 1981. The actual prevalence is unknown and the above figure genuinely underestimates the spread of the problem. This might also be because of the shortage of awareness, reporting, right investigation, laboratory facilities and capacities. Very frequently a sound epidemiological research alone can suggest the maximum possible or in all likelihood reason for the outbreak.(Grewal and Khera, 2017,Ovca et al., 2014)

It is important for adolescents to understand food-related risks to preserve their health and the health of others and it is also crucial for the people who are preparing the food to have more awareness on the safety procedures and sanitary practices as it directly impacts the health of the consumer. Potentially risky procedures include preservation of leftovers in an unsanitary environment, reheating of food in a possible unsafe way and food preparation with unprotected wounds on their hands .(Sacks, 1985) Student education regarding food poisoning needs to be in focus in an effort to lessen diseases which are food borne. Educational material concerning Good Housekeeping Practice should be made available to the general public from many sources. The people who prepare food need to be more health conscious. Of about 10% to 20% of the total food-borne ailment outbreaks are caused due to contamination by means of the food handlers. The mishandling of meals and the discussion of hygienic measures allow contaminants to come into contact with meals and in a few cases multiply in sufficient numbers and cause illness in the consumers with some common symptoms like tiredness, headaches, discomfortness, bowel irritation etc., (Ashritha et al., 2020) Personal hygiene and environmental sanitation are also key factors in the transmission of food- borne diseases. Investigations of outbreaks of food-borne sickness at some point of the world show that, in almost all instances, they are because of the failure to observe high-quality standards in preparation and storage of food. Previous studies have been made and reasons have been mainly attributed to either food (intake of chicken) (Rampal et al., 1984) or to any processing and storage methods (Improper tin coating). The aim of the study is to analyze the individual perspective on the flare up of food poisoning among hostel students.

MATERIALS AND METHODS:

A questionnaire study was conducted among 100 students residing in hostels throughout Chennai. Random sampling method was used. Validation of the questionnaire was done by the guide and Scientific review board in Saveetha dental college and hospitals, Chennai. Questionnaire was circulated as google forms link. The questionnaire included the perspective of students in hostels regarding the food habit and outcome results of it. The results obtained were recorded in google spreadsheets and were calculated by descriptive statistics and chi-square test in SPSS software.

RESULTS AND DISCUSSION:

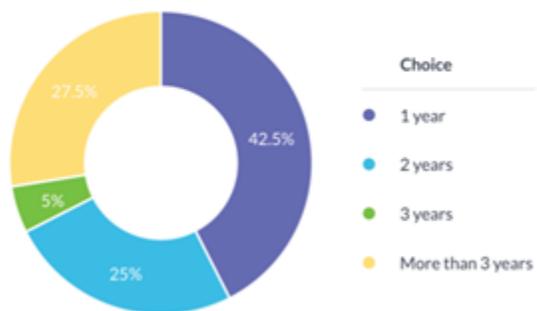


Figure 1: Duration of the hostel stay

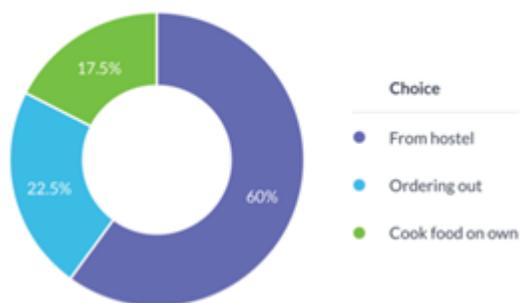


Figure 2: The source of food consumed

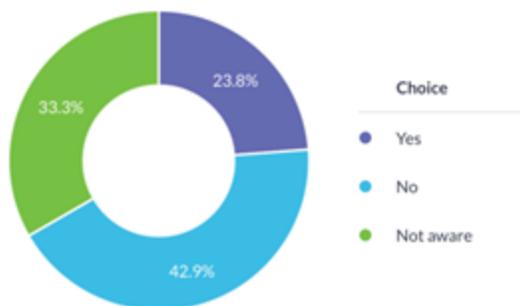


Figure 3: Cleanliness of the hostel food

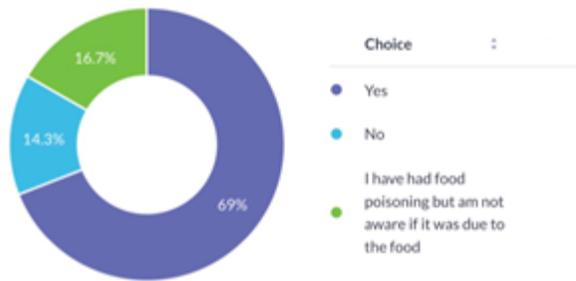


Figure 4: Prevalence of food poisoning among hostellers

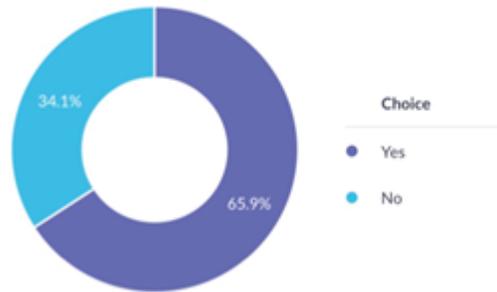


Figure 5: Hostellers Observed the way of food preparation in the hostel

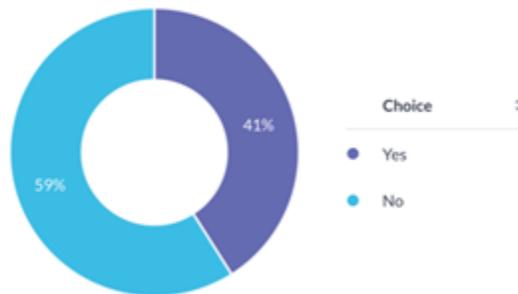


Figure 6: Satisfaction level of the Hostellers on food at hostels.

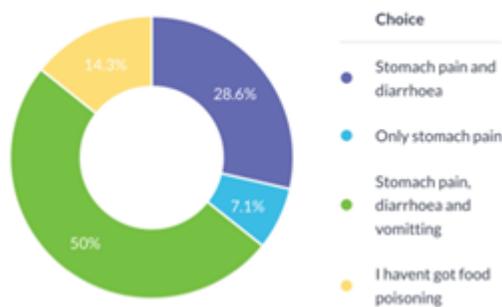


Figure 7: Symptoms of food poisoning commonly observed.

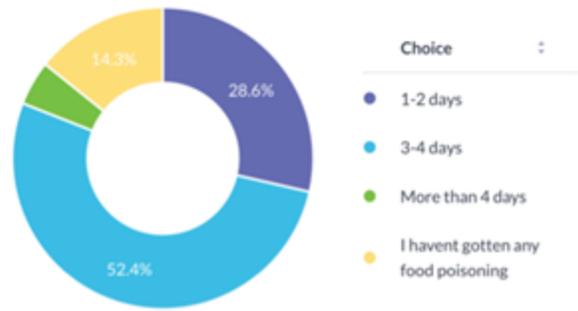


Figure 8: Duration of the symptoms of food poisoning.

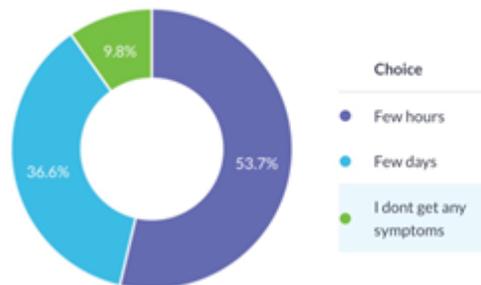


Figure 9: Incubation period of food poisoning among the hostellers.

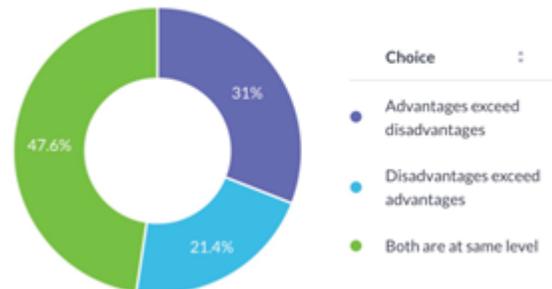


Figure 10: Advantage versus Disadvantages of Hostel life.

DISCUSSION

A generalized study on hostels across Chennai has been conducted in form of a questionnaire to gauge the individual perspective of hostel students on their food habits and the associated problems. From the responses, around 42.5% have been residing in hostels for over a year, 25% have been staying for 2 years, 17.5% for 3 years and 5% have been residing for more than 3 years (Figure 1). It is observed that the majority of the hostel students observed are not much experienced with the ways of hostel foods as they have not stayed in hostels for very long. Such a change of environment can also be a cause of the food poisoning. Secondly, the majority of 60% of the hostel students consume food prepared only in the hostel while 22.5% order out and

17.5% of the students prefer to cook on their own. This shows the dependence of the students on hostel food (Figure 2).

Only 23.8% thought that the food served in the hostel is sanitary, while the majority 42.9% thought the opposite. 33.3% responded that they were not aware (Figure 3). An overwhelming percentage of students, 69% claim that they have had food poisoning due to consumption of hostel food and only 14.3% say that they had not any food poisoning. The rest 16.7% were not aware whether the food poisoning they experienced was due to the hostel food or any other external cause (Figure 4). 65.9% reported that they have seen unsanitary practices followed in their hostels. Whereas 34.1% were not observed (Figure 5). This showed that even though the hostellers observed the unsanitary practices on food preparation in the hostels, they were consuming the same. About 59% are not satisfied or content with the food they are being served as shown in (Figure 6) and 41% of the hostellers were satisfied with the food in their hostels.

When questioned about the symptoms, the majority of 50%, say that it is generally stomach ache and diarrhea combined with vomiting, while for 28.6% stomach ache and diarrhea were the major symptoms and around 7.1% had only stomach ache (Figure 7). About the duration of the symptoms of the food poisoning, 52.4% say that they stay for around 3-4 days, 28.6 report 1-2 days and 14.3% claim to have symptoms for more than 4 days (Figure 8). This indicates that in case if it was a bacterial attack, the bacteria are generally self-limiting. As shown in (Figure 9), on consumption of the infected food, 53.7% of the students generally get food poisoning within a few hours, 36.6% claim they get it within a few days and 9.8% of them haven't had any symptoms prior. This can be seen, in case of a bacteria as a bacterium with a short incubation time. In a similar case study, (Park, 2005) it was observed these symptoms were generally reported in bacterial cases of infection by *B. cereus* (diarrheal toxin) or *C. perfringens*.

Studies on salivary ribonuclease activity in healthy, gastric carcinoma, food poisoning and bacillary dysentery divulged that ribonuclease activity decrease in patients with bacillary dysentery and food poisoning in contrast with controls was insignificant ($P > 0.05$). (Adigamov, 1968) Improper diet due to food poisoning decreases the haemoglobin value by 0.2% irrespective of other external factors leading to anaemia. (John and Brundha, 2016) with findings like breathlessness, tiredness, pale lips and skin, tachycardia etc., . (Malay et al., 2018) The study on salivary pH estimation in diabetic and non diabetic patients revealed that pH range of 5.5-7 in diabetic and 6.5-8 in non diabetic patients. Low pH in diabetic patients with less insulin affinity are gradually driven to caries exposure and periodontitis. (Halawa et al., 2010)

Changes in the instructional or educational system, that had once Finally, when asked about their opinion on whether they consider hostel life to be more advantageous or disadvantageous, 47.6% claim that they feel that the both balance out while 31% opted for advantageous and the remaining 21.4% choose disadvantageous over advantageous (Figure 10).

The defaulting environmental parameters of compromised sanitary conditions, inadequate storage in refrigerators, improper stocking of uncooked food and dangerous cooking practices could be enhancing factors. Unsafe cooking practices of cooks now not wearing gloves and caps, cooking meals much earlier than service time, keeping cooked meals unrefrigerated for long, and

insufficient/partial heating of the food tend to compound the situation. Any of the factors above can be the incriminating motive for the infection of food.(Sudershan et al., 1996) (Prasad et al., 2015) (Mustafa et al., 2009) To date, around 250 distinct food-borne diseases have been described and microorganisms are said to be the main causative agent of thirds of food-borne disorder outbreaks. Among the primary microorganisms involved in those diseases, *Bacillus cereus*, *Staphylococcus aureus*, *Clostridium perfringens* and *Salmonella* are a leading cause of gastroenteritis as a consequence of the consumption of contaminated food.

Clostridium perfringens is an anaerobic, Gram-positive, spore-forming rod-shaped bacteria and is said to cause perfringens food poisoning, the signs of which might be excessive belly cramps and diarrhea.(Jadhav et al., 2007) (Brynstad and Granum, 2002) *Clostridium botulinum* is an anaerobic, Gram-positive, spore-forming rod-shaped bacteria. It produces a robust neurotoxin. The spores are generally heat resistant and can continue to exist in meals which are incorrectly or minimally processed. Food-borne botulism is a severe sort of food poisoning which results from the ingestion of meals containing the robust neurotoxin formed during the increase of the organism.(Brown, 2000) (McKillip, 2000) *Bacillus cereus* is a Gram-positive, facultatively aerobic, spore-forming rod-shaped bacteria. Two forms of illness are caused by two metabolites. Diarrheal kind of illness is resulted from a big molecular weight warmness-labile protein. This sort of *B. cereus* poisoning mimics *C.botulinum*. Bacterial colonies like *Veillonella*, *Fusobacterium*, *Proteobacteria*, *Prevotella*, *E.coli* etc.. harbour in causing food poisoning by lack of clean utensils.(ThamaraiSelvi and Brundha, 2020) Protection devices for food like toe guards and insulated boots equipments provides protection against crushing, rolling, falling and penetrating poisonous and corrosive materials.(Jaisankar et al., 2020) Face mask protects from aerosol and droplet spread of most of the respiratory diseases mostly in pandemic conditions. (Naveenaa et al., 2020) Previous survey study on chia seeds improving immunity against infections was done where 77% of the participants were aware of chia seeds and its role in increasing the immunity against infections, cardiovascular risk and weight loss. (Akash et al., 2020) Physical fitness among students as a day to day activities like exercise and brisk walk can resist the pestilent act of spread of disease. Hygienic hand prevents the common mode of nosocomial spread also diseases like food poisoning, cold and person to person spread of diseases. (Ananya et al., 2021) Hand wash is a effective and simple measure for elimination of pathogens persisting in the hand of front line workers and health care professionals.(Ravichandran and Brundha, 2016) The most important step in preventing nosocomial pathogenic infections is a good hand hygiene.(Nivedhita and Brundha, 2020)

Perfringens food poisoning which includes watery diarrhea, belly cramps and pain. Streptococcal enterotoxins are a main cause for food poisoning, which typically occurs after ingestion of various foods, especially processed meat and dairy products, contaminated with *S. aureus* with the excess aid of improper handling and subsequent storage at increased temperatures. Spread of infection can also be from the blood or body fluids leading to diseases.(Deepika et al., 2020) Sanitizers (alcohol based) are effective against germs(36%). (Kalaiselvi and Brundha, 2016) Symptoms are of fast onset and include nausea and violent vomiting, with or without diarrhea.

The contamination is normally and generally self-limiting and only once in a while it is severe enough to be a cause for hospitalization. (Argudín et al., 2010) Food safety within the circle of consumer and seller which allowed the child more clarity on the subject of awareness on food safety named as domestic economics have resulted in a deduction or even removal of such courses over the last 2 decades. (Beard, 1991) (Koepl and Robey, 1998) Opportunities for children to learn safe meals dealing with thorough understanding has faded as nowadays mothers have taken employment outside the house and also the reliance on absolutely or in part pre-prepared convenience ingredients has increased. As a result, a massive percentage of teenagers and adults have limited meals guidance experience and by no means learned primary food protection principles and thus lack important knowledge had to proactively shield themselves and their families in their future. In the end, prevention of food poisoning lies in the hands of both the food preparer and the food consumer. Awareness of the deleterious effects the unsanitary preparation of food and its storage will have on the student's health should be considered properly and steps should be taken accordingly. (Byrd-Bredbenner et al., 2010). Our study has limitations that it was not targeted to analyse the major food borne infections that commonly affect the hostel students. Studies can be done to overcome the limitations of our study in the future.

CONCLUSION:

Within the limitations of our study, our survey towards the knowledge on food poisoning in hostels across Chennai, concluded that Food poisoning among hostellers is common around 69% and the incidence of food poisoning is reduced when the duration of stay in hostel exceeds 2 years. Also we found that it is very common in places where food is prepared in bulk. Whenever there is any compromise on the sanitation of food and cleanliness there can be an outbreak of food poisoning. Only appropriate awareness on this topic can influence the reduction in future food poisoning cases.

Conflict of interest : NIL

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