Food Safety in Eating Establishments: Assessing Conformance of Eating Establishments to Food Safety and Standards Regulations

Surinder Kumar, Puja Dudeja, Prenna Shankar, Simrandeep Kaur

Department of Community Medicine, Armed Forces Medical College, Department of Community Medicine, Station Health Organisation, Pune, Maharashtra, Department of Pathology, SGRD Medical College, Amritsar, Punjab, Department of Pathology, AFMC, Pune, India

Abstract

Introduction: In view of the rising burden of the foodborne illnesses and the rise of eating out culture in India, food safety has assumed greater significance. The Food Safety and Standards Authority of India has prescribed food safety and standards regulations (FSSRs) for commercial eating establishments (EEs). The present study was carried out to ascertain conformance of the EEs to these regulations. Methodology: It was a cross-sectional study conducted on 74 EEs in a metro city in western Maharashtra from May to October 2019 using an interviewer-administered study tool based on FSSR 2011. The study tool covered critical domains such as food hygiene, equipments, health and personal cleanliness, training of food handlers, and product information. Results: Seventy-four EEs included 29 restaurants, 21 bakeries, and 24 snack bars. The score ranged between 42.3% and 73.3%. Of 74, 20 (27%) EEs were placed in poor category (score <50%), Only 3 EE scored >70% and were rated as very good. Only 13 (17.6%) EEs were cleaning the food contact surfaces adequately, i.e. before and after each use, whereas 38 (51.4%) were not cleaning food contact surfaces at least daily. The knowledge regarding food handlers as potential carriers of disease was poor with 60.81% of the respondents having no knowledge about it. Conclusion: The study found significant gaps in EEs with respect to studied food safety domains of FSSR 2011.

Keywords: Food handlers, food safety, food safety regulations, Food Safety and Standards Authority of India

INTRODUCTION

Our food travels a long journey from farm to fork, and can get contaminated at any point in this journey. Safe food saves lives, whereas unsafe food predisposes individuals to risk of foodborne illnesses (FBI). Billions of people worldwide are at risk and as per the WHO estimates 33 million DALYs were lost due to foodborne diseases in the year 2010. The first-ever estimates of global burden of FBI revealed that every year, every tenth person on this globe falls ill due to consumption of unsafe or contaminated food, and 420000 people die of FBIs annually. In India, there were 11,387,897 reported cases and 2135 reported deaths due to acute diarrheal illnesses, enteric fever, and viral hepatitis combined, in the year 2011. In the year 2016, a total of 16,528,349 cases and 2517 deaths were reported due to the above-mentioned three diseases. The data from the Integrated Disease Surveillance Project, of past 3 years, show the upward trend of these diseases in the country. The actual numbers are expected to be much higher in India, owing to considerable underreporting and availability of over-the-counter antibiotics combined with self-medication. At the same time, the food service industry in India is one of the fastest developing industries in the country. This growth is being driven by the younger population and rapid urbanization and globalization. More and more people are coming out of their towns to work in metro and mini metro cities. Moreover in urban India, where both the spouses work, it leaves lesser time to cook and contributes to growth of eating out culture.

Address for correspondence: Dr. Surinder Kumar, Department of Community Medicine, Armed Forces Medical College, Pune, Maharashtra, India. E-mail: dr_vashisht@yahoo.co.in

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Kumar S, Dudeja P, Shankar P, Kaur S. Food safety in eating establishments: Assessing conformance of eating establishments to food safety and standards regulations. Indian J Community Med 2021;46:697-700.

Received: 03-06-20, Accepted: 13-07-21, Published: 08-12-21
RESULTS

The EEs consisted of 29 restaurants, 21 bakeries, and 24 snack bars. The lowest score obtained was 42.33% and the highest was 73.26%. The EEs were placed in one of the four categories based on the score obtained. Out of 74, 20 (27%) EEs scored below 50% and were placed in poor category and only one EE scored above 80% and was rated as excellent. There were only two EEs in very good category [Table 1]. The storage practices of raw and cooked foods were also evaluated and the results were disheartening. None of the EEs scored >60% even as 49 (66.22%) EEs had a score of <40% and were classified as “very poor” in terms of storage practices [Table 1]. The food items were stored in utter disregard of the recommendations. Storage areas were shoddy and poorly maintained with pest infestation. Vegetarian food was stored with meat and poultry items. Raw and cooked food was being stored together. Chutneys used in various food preparations were prepared in bulk for a month or so and stored in unhygienic conditions.

The EEs were scored on the personal cleanliness, knowledge, and practices of food handlers working there [Table 2]. Only 5 (6.76%) EEs were found to be “very good” having scored >70%. This domain included of handwashing practices, changing clothes before work, use of gloves, practices such as smoking or chewing tobacco or touching body parts/hair or tasting food with fingers, and wearing any jewelry or watch or bands on hands/wrist during handling food. The knowledge regarding food handlers as potential carriers of disease was dismal with 60.81% of the respondents having no knowledge about it. Facilities for handwashing of the food handlers were not present in 60.81% of the EEs; in 62.16% of the EEs, the food handlers were not practicing handwashing as recommended. The handwashing practices were inadequate at most of the EEs [Table 3]. The food handlers were permitted to handle currency in 56 (75.7%) EEs. Although provision of soap for food handlers to wash hands was not part of the checklist, the investigators observed the EEs were resorting to cost-cutting measures by not

Table 1: Status of conformance of eating establishments

| Score (%) | Classification | EEs, n (%) |
|-----------|----------------|------------|
| <50       | Poor           | 20 (27.02) |
| 50.1-60   | Satisfactory   | 45 (60.81) |
| 60.1-70   | Good           | 6 (8.11)   |
| 70.1-80   | Very good      | 3 (4.05)   |
| >80       | Excellent      | Nil        |

| Score based solely on food storage practices |
|---------------------------------------------|
| <40  | Very poor | 49 (66.22) |
| 40.1-50 | Poor       | 20 (27.03) |
| 50.1-60 | Satisfactory | 5 (6.76) |
| >60  | Good       | Nil        |

In view of the increasing burden of FBIs and the rise of eating out culture in India, food safety becomes extremely important. The Food Safety Standards Authority of India (FSSAI) has come up with a checklist for inspecting hygiene and food safety standards of eating establishments (EEs). However, there are no studies on conformance to this checklist. Hence, the present study was carried out to ascertain conformance of the EEs to food safety standards regulations (FSSR) of 2011 and to educate the food handlers as well as the managers of these EEs regarding safe food handling practices.

METHODOLOGY

It was a community-based cross-sectional descriptive study conducted in cantonment area of a metro city in western Maharashtra from May to October 2019. A list of EEs operating in the cantonment area was obtained from the cantonment board consisting of 106 EEs. All EEs were approached to be part of the study; however, 32 EEs (12 bakeries, 11 snack bars, and nine restaurants) were under the process of applying/renewal of their food business license and were apprehensive hence did not volunteer. They were excluded and 74 volunteering EEs were included in the study. Informed consent from food business operator (FBO) of the EE was obtained and they were told that the exercise was intended for research purposes only. An interviewer-administered study tool based on FSSR 2011 checklist was prepared. The study tool covered critical domains such as food hygiene, equipments, health and personal cleanliness, training of food handlers, and product information.

Each question in the tool scored between 1 and 3 (poor, satisfactory, and good). Based on this, each EE was given a separate score on conformance to FSSR 2011. Each EE was evaluated separately after excluding items that were not applicable to the EE under study. Since all items of the tool were not applicable to all EEs, the maximum attainable score was different for each EE. For comparability among all EEs, the percentage score was calculated for each EE based on the respective maximum score and score attained. The status of conformance of each EE with respect to FSSR 2011 was graded as per the percentage score attained. Each of the EEs was placed in one of the four categories, namely poor, satisfactory, good, and excellent based on the score attained.

The EE was visited during nonbusiness hours to avoid disturbing the usual business of the EE. The average time taken was 40–45 min for inspecting and scoring each of them. All items listed in the questionnaire were inspected personally by the authors, and scoring was endorsed during the visit itself. Recommendations tailored to the requirement of each EE were given at the end of inspection and interview. The food handlers were encouraged to ask their queries regarding food safety during the interaction. The data were compiled and analyzed using Microsoft Excel.

To FSSR 2011 (n=74). FSSR: Food safety and standards regulations, EE: Eating establishments
Table 2: Personal cleanliness practices of the food handlers

| Activity                              | Practice | EEs, n (%) |
|---------------------------------------|----------|------------|
| Food handlers smoking or chewing      | Never    | 45 (81.0)  |
| tobacco in food preparation area      | Sometimes| 23 (31.1)  |
|                                       | Always   | 6 (8.1)    |
| Food handlers spitting in food         | Never    | 29 (39.2)  |
| preparation area                       | Sometimes| 11 (14.9)  |
|                                       | Always   | 34 (46.0)  |
| Touching hair or other body parts     | Never    | 2 (2.7)    |
| such as eye, nose, and ear            | Sometimes| 44 (59.5)  |
|                                       | Always   | 28 (37.3)  |
| Cover nose when coughing or sneezing  | Never    | 17 (23.9)  |
| in food preparation area              | Sometimes| 51 (68.9)  |
|                                       | Always   | 6 (8.1)    |
| Trimmed hair of food handler          | Never    | 31 (42.9)  |
|                                       | Sometimes| 34 (46.0)  |
|                                       | Always   | 9 (12.2)   |

EE: Eating establishments

Table 3: Handwashing practices of food handlers at eating establishments (n=74)

| Activity/practice                                | EEs, n (%) |
|--------------------------------------------------|------------|
| Wash hands before commencing day’s work          |            |
| Never                                            | 28 (37.8)  |
| Sometimes                                        | 43 (58.1)  |
| Always                                           | 3 (4.1)    |
| Wash hands after handling raw food                |            |
| Never                                            | 58 (78.4)  |
| Sometimes                                        | 11 (14.9)  |
| Always                                           | 1 (1.4)    |
| Do not handle raw food                           | 0 (0.0)    |
| Wash hands after handling soiled equipment or    |            |
| utensil                                           |            |
| Never                                            | 54 (73.0)  |
| Sometimes                                        | 18 (24.3)  |
| Always                                           | 1 (1.4)    |
| Not applicable                                    | 1 (1.4)    |
| Wash hands after coughing, sneezing, or blowing  |            |
| nose                                              |            |
| Never                                            | 37 (50.0)  |
| Sometimes                                        | 35 (47.3)  |
| Always                                           | 2 (2.7)    |

EE: Eating establishments

Discussion

The findings of our study and interaction with the staff at EEs enabled us to find significant issues affecting food safety. Irwin et al. suggested regular scoring of EEs as an aid to predict the risk of outbreak of FBI. Use of a standard checklist for this scoring gives an objective assessment and can help follow-up the hygiene and standards of EEs with rising or falling of scores in subsequent inspections. Conformance to the FSSR 2011 means high food safety and resultant lesser chances of FBI. Every person visiting the commercial EEs rightfully expects to have safe food, even as all the EEs are obliged to do that. The lack of knowledge, poor practices, and profiteering pose as a hurdle in the way to fulfill their obligation.

In a longitudinal study conducted by Dudeja and Singh in Chandigarh, conformance of EEs in and around a tertiary care hospital was studied. The minimum and maximum preintervention scores were 41.28% and 77.25%, respectively, while in our study, it was 42.33% and 73.27%. The authors in an earlier study reported 33.33% EEs having “poor” scores and only 5.55% EEs able to get “very good” grading; in the present study, 27.03% and 4.05% of EEs were classified as “poor” and “very good,” respectively. A significant knowledge gap was found among food handlers in Chennai by Manes MR et al. in similar domains. They found that the knowledge score was higher among food handlers having a medical fitness certificate. Handwashing practices were found to be inadequate. Handwashing has been proven to reduce the risk of diarrheal diseases.

Handling of currency by food handlers poses an additional risk of transmission of disease-causing pathogens. Currency notes handled by food handlers have been found to be contaminated with a variety of pathogens in a study conducted in Lucknow. The pathogen load varies with type of currency, its physical condition, and denomination, lower denomination currency was found to be more contaminated.

Handwashing is the simplest yet effective intervention for safe food. The EEs must provide soap for handwash and handwashing should be encouraged. The FBO/manager should handle all the currency, food handlers, especially those dealing with clients, should not be permitted to handle currency. The practice of customers paying the bill on the dining table along with custom of paying tip to food handler serving the food promotes handling of currency by food handlers. Therefore, zero handling of currency by food handlers cannot be achieved without active involvement of customers and the management to find alternative ways and means.

Substantial gains can be made by no or low-cost interventions such as improving storage, handwashing practices, not wearing jewelry items, and changing clothes before commencing work among others.

The nonparticipation by 32 EEs may have introduced bias in the study.
**Conclusion**

We found significant gaps in EE with respect to food safety domains of FSSR 2011. There is a pressing need to train and educate FBOs and food handlers to improve food safety.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Foodborne Disease Burden Epidemiology Reference Group, (FERG). Who Estimates of the Global Burden of Foodborne Diseases; 2015. Available from: http://www.who.int/foodsafety/areas_work/foodborne-diseases/ferg/en/. [Last accessed on 2019 Sep 14].

2. MiyagishimaK. WHO’s First Ever Global Estimates of Foodborne Diseases Find Children Under 5 Account for Almost One Third of Deaths Note to the Editor; 2018. p. 6-11. Available from: http://www.who.int/en/news-room/detail/03-12-2015-who-s-first-ever-global-estimates-of-food-borne-diseases-find-children-under-5-account-for-almost-one-third-of-deaths. [Last accessed on 2018 Aug 07].

3. Ministry of Health and Family Welfare G of I. Press Information Bureau Government of India Ministry of Health and Family Welfare. Available from: http://pib.nic.in/newsite/PrintRelease.aspx?relid=106612. [Last accessed on 2019 Sep 14].

4. The Minister of Health and Family Welfare, (Shri Jagat Prakash Nadda). Lok Sabha Starred Question No. 567. Vol. 567. Publisher: Govt of India, New Delhi; 2018. Available from: http://164.100.47.190/lokshabhaquestions/annex/14/AS567.pdf. [Last accessed on 2019 Nov 11].

5. IDSP. A Monthly Surveillance Report from Integrated Disease Surveillance Programme National Health Mission January 2017. Vol. 2. Publisher: Govt of India, New Delhi; 2017.

6. FICCI. Indian Food Services Industry: Engine for Economic Growth and Employment. Govt of India, New Delhi; 2017. Available from: http://ficci.in/spdocument/20969/foodzania-2017-report.pdf. [Last accessed on 2019 Nov 11].

7. Irwin K, Ballard J, Grendon J. Results of routine restaurant inspections can predict outbreaks of foodborne illness: The Seattle-King County Experience. Am J Public Health 1989;79:586-90.

8. Manes MR, Liu LC, Dworkin MS. Baseline Knowledge Survey of Restaurant Food Handlers in Suburban Chicago: Do Restaurant Food Handlers Know What They Need to Know to Keep Consumers Safe?. Journal of Environmental Health.2013;76:18-27.

9. Curtis V, Cairncross S. Effect of washing hands with soap on diarrhoea risk in the community: A systematic review. Lancet Infect Dis 2003;3:275-81.

10. Green LR, Selman CA, Radke V, Ripley D, Mack JC, Reimann DW, et al. Food worker hand washing practices: An observation study. J Food Prot 2006;69:2417-23.

11. Singh S, Singh M, Tiwari M, Kumar S, Kumari P, Saxena S. Indian currency uncovered with microbes retrieved from expected and unexpected transaction points. Int J Med Public Health 2015;5:242-6.

12. Hassan A, Farouk H, Hassanein F, Abdul-Ghani R. Transactions of the royal society of tropical medicine and hygiene currency as a potential environmental vehicle for transmitting parasites among food-related workers in Alexandria, Egypt. Trans R Soc Trop Med Hyg 2011;105:519-24.

13. Girma G, Ketema T, Bacha K. Microbial load and safety of paper currencies from some food vendors in Jimma Town, Southwest Ethiopia. BMC Res Notes 2014;7:43. Available from: http://www.biomedcentral.com/1756-0500/7/434.