

# Association Between Food Safety Knowledge and Practice of Food Handlers in Food Businesses at Kushtia, Bangladesh

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**Abstract:** The target of this study was to evaluation of knowledge, and practices regarding food safety problems among street food workers at Kushtia, leading face to face discussion and directing questionnaire. Of the 200 food workers who responded, 3.05% were involved in stirring or allotting unpacked foods regularly and use self-protective gloves during their working practices. Almost all contributors had not taken basic food safety training. The mean food safety knowledge scores were  $23.4 \pm 10.3$ . The study presented that food handlers in Kushtia Sadar food businesses frequently have absence of knowledge concerning the basic food safety. There is an immediately necessary for education and increasing alertness among food handlers concerning safe food handling practices.

**Keywords:** Food Handlers, Food Businesses, Knowledge, Practices

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## 1. Introduction

The rising number of food harming epidemics and food-related shocks has controlled to calls for better hygiene and fineness practices. Food harming epidemics of *salmonella*, *listeria*, and *Escherichia coli* 0157 have made the people more heretic of the food they eat.

In recent months the conversation nearby The European Commission has predictable the importance of directing food-harming epidemics owing to the raising amount of meals eat outer the home, in similar with the ever expanding series of pre-ready meals. This altering consumer lifestyle highlights the requirement for healthier, real ways of governing food hygiene. There is solid statistical indication that the frequency of food harming caused by caterers is better than in any other food segment, accounting for 70% of all microbial food harming epidemics. Seventy per cent of these food harming epidemics are due to the insufficient time and temperature control of food, though the remaining 30% are the outcome of cross-contamination [17]. The hands of food facility workers can be courses in the extent of foodborne illnesses because of low personal hygiene. For example, a worker might infect his hands when using the latrine, or microbes might be extent

from uncooked meat to salad leaves by food workers hands, point out that records on hazardous elements for foodborne illnesses suggest that maximum epidemics outcome from inadequate food handling practices [1, 4]. A study in the USA recommended that inappropriate food handler practices donated to almost 97% of foodborne diseases in foodservice institutions and households [10]. Food harming follows the consumption of microbes that may have been extant in previously soiled food, which may have resulted from insufficient food protection methods or hazardous cooking practices or which may have ascended from cross-contamination from equipment, surfaces, or from persons who convey enterotoxigenic staphylococci in their body surface [2, 14]. Foodborne viruses also spread by infected food handlers. Foodborne germs such as the Hepatitis A virus and the diarrhoea-causing, minor round-structured viruses which are colonial in vast amounts by infected persons. Several cases of foodborne virus corruption have been linked with catering [18]. Poor sanitary implements in food storing, management, and preparation can make a condition in which bacteria such as *campylobacter*, *salmonella*, and another transferable infectious agent [8, 9]. Food staffs may spread pathogens rigidly from a soiled source, viz., from unprepared poultry to a

food such as icy cooked meat that is to be consumed without reheating. During the acute phases of gastroenteritis huge amounts of microbes are evacuated and by the environment of the infection are probable to be broadly distributed; obviously, food workers who are symptomatically sick may represent actual threat and should be avoided from work. Good hygiene, both individual and in food preparing performs, is the base for stopping the spread of pathogens from food preparing workers to user. [3]. The Food and Drug Administration (FDA), with provision from administration organizations and the food industry has permitted food service employee training since 1976; however, since that time, the trade food service industry, has strengthened efforts to increase retail food safety through training of restaurant supervisors and workers [12]. When food harming epidemics are examined it has been recognized that minor and middle sized businesses are often significant places in the spread of foodborne disease [15]. In Bangladesh, there are various matters impressive threat on food safety due to development and mass production, rise of lengthier and more complex food chains, fast food ingesting, street vendors etc. Besides, long-term increase and other economic reasons; announcements, rising eating out practices (street foods, hotel meals etc.) are also the possible reasons of food safety difficulties in Bangladesh. The aim of this study was to estimate knowledge and practices among food workers with concern to food hygiene in food businesses in Kushtia, Bangladesh.

## 2. Materials and Methods

### 2.1. Sampling Plan

This survey was conducted from March 2019 to July 2019 including 200 food handlers in 70 street food vendors at Kushtia, Bangladesh. A printed two questionnaires were organized for this research. All questionnaires were conducted by a face-to-face discussion concerning the queries and responses to confirm the correctness of the responses. Two investigators in research squad were skilled by the researchers to conduct this assessment. The interrogators who were designated had educational backgrounds in nutrition and food technology. The interview was led by the research squad persons who speak every of the queries clearly during interview. Participants were given sufficient time to response every question in writing.

### 2.2. Questionnaire Survey

A scheduled questionnaire and a specification were assembled; covering many features connecting to food safety knowledge and practices among the street food vendors. These comprised of five groups, viz., (i) socio-demographic data, (ii) processing and preparation practices, (iii) individual hygiene practices and, (iv) storing practices. The questionnaires were done by means of interviews. A specification was used to measure the physical arrangement of the shop, the hygiene of the food processing area and the own hygiene of the food workers. The food safety knowledge

questionnaire for food workers included 21 questions each with three probable replies. For food safety knowledge questionnaire the score range was between 0 and 21. This food safety knowledge scores were altered to 100 points. The score less 50% of knowledge questionnaire is believed that the knowledge is poor. The food safety practices questionnaire was made based on the previous study directed [2]. The food safety practices questionnaire contained of a list of 10 food safety practices that would showed food workers handling practices toward foodborne disease inhibition. A three-point rating scale (1=doesn't know to 3=always) was used for food handlers to percentage the level of effect of each handling practice. The food safety practices score ranges were between 0 and 30. The scores were altered to 100 points.

### 2.3. Data Processing and Analysis

The data record was started instantly after finish of data collection. The obtained data was tested, confirmed and then record into the computer. Only totally completed questionnaires was recorded into the computer for final analysis of data. STATA software was used for data analysis. For statistical analysis, bi-variate, univariate and multi-variate analyses were completed to food safety knowledge with other selected characteristics. p value less than 0.054 with 96% confidence intermission was considered as statistically significant.

## 3. Result

### Participants

Two hundred (200) food handlers answered to the questionnaire from 70 street food vendors, with answer rate of 96.8%. The maximum (76.6%) food workers had received primary education (year 5 of primary school). Approximately half (51.3%) of the respondents had been worked 3 or more years in some section of the food related businesses. The chief group (59.6%) of the food workers was between 20 and 35 years of age, and 10.5% were females.

### Food safety knowledge

The food handler's knowledge (food safety related) was very poor. Almost all respondents (47.8%) had not taken training with food safety. The mean food safety knowledge scores was  $23.4 \pm 10.3$  (100 probable points). Mean scores and standard deviations for questionnaire sections were as follows: temperature control knowledge ( $24.5 \pm 19.3$ ), food poisoning knowledge ( $23.1 \pm 12.2$ ), cross-contamination knowledge ( $28.7 \pm 12.1$ ) and, personal hygiene knowledge ( $17.1 \pm 14.5$ ). Food safety knowledge queries that were maximum frequently replied wrongly were associated to time-temperature regulator and cooling and thawing and hand-washing behavior. Table 1 showed that, above half of the respondents (55.70%) were know safe food handling is an essential part of my work duties but 25.25% reply negatively. Only 40.60% respondents were know uncooked foods should be kept separately from prepared foods. Approximately 25.90% respondents were know using

masks, cap, protective gloves, and suitable clothing decreases the hazard of food contamination while 55.03%

response adversely. Other food safety related knowledge showed in table 1.

**Table 1.** Knowledge of food handlers.

Statements	Yes (%)	No (%)	Don't know (%)
Do you know safe food behavior is an essential part of my work duties	55.70	25.25	19.05
Do you know learning about food safety is essential to me	20.05	59.70	20.25
Do you know uncooked foods should be kept separately from prepared foods	40.60	35.29	24.11
Do you know using masks, cap, protective gloves, and sufficient clothing reduces the risk of food contamination	25.90	55.03	19.07
Do you know it is essential to know the temperature of the refrigerator to decrease the hazard of food safety	25.85	54.10	20.05
Do you know it is required to check thermometer settings of freezers and refrigerators once for every day	5.65	85.20	9.15
Do you know unsuitable storage of foods may be risky to health	15.13	65.77	19.10

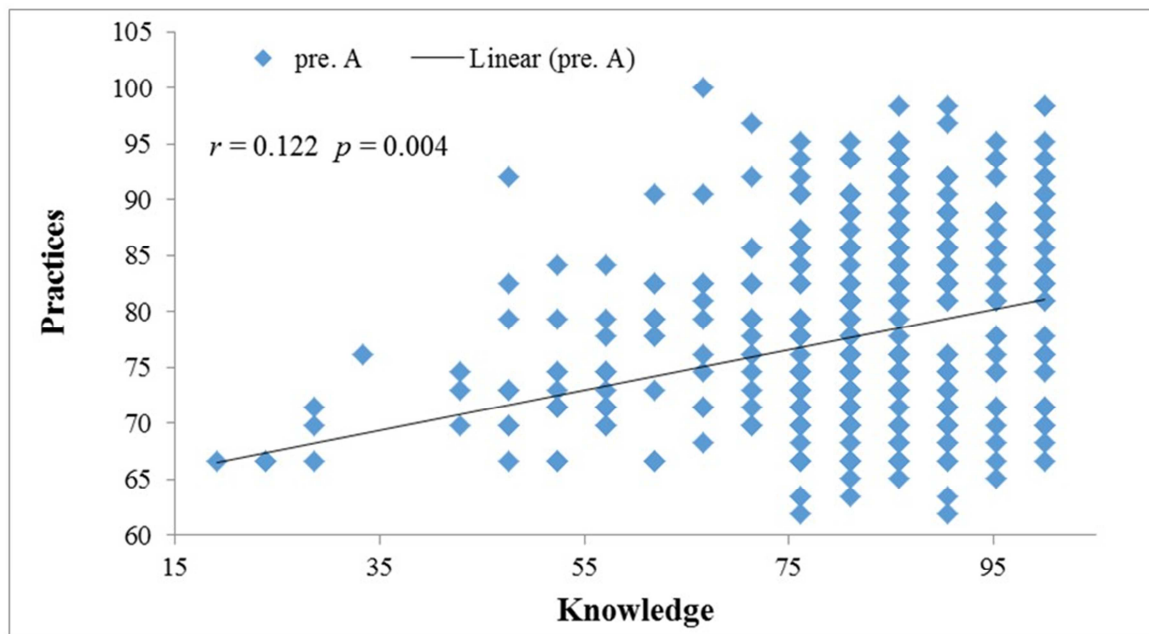
#### Food safety practices

The self-reported hygienic practices presented that only 3.05% of those who involved in touching or allotting unpacked foods regularly (always) use defensive gloves during their handling practices (Table 2). Food handlers, who used gloves, maximum cleaned or washed their hands before setting them on (2.03%) and after eliminating them (1.01%). Food workers, who used mask and cap when touching or allotting unpacked foods about 1.19% and 2.01% respectively. Approximately

3.75% and 5.02% food handlers cleaned and washed their hands before and after touching unpacked uncooked foods respectively. About 7.14% food workers cleaned and washed their hands before touching unpacked cooked foods and 5.86% cleaned and washed their hands before touching unpacked cooked foods. So, the food safety practice score of food workers were  $13.2 \pm 4.2$  (100 probable points). There is a variance in food safety practices scores between qualified and unqualified food handlers ( $p < 0.054$ ).

**Table 2.** Practices of food handlers.

Statements	Always (%)	Sometimes (%)	Never (%)
Do you use gloves when you touch or allot unpacked foods?	3.05	5.10	91.85
Do you clean or wash your hands before using gloves?	2.03	4.20	93.77
Do you clean wash your hands after using gloves?	1.01	2.09	96.90
Do you use defensive clothing when you touch or allot unpacked foods?	2.50	3.90	93.60
Do you practice a mask when you touch or allot unpacked foods?	1.19	3.50	95.31
Do you wear a cap when you touch or allot unpacked foods?	2.01	4.25	93.74
Do you clean or wash your hands before touching unpacked uncooked foods?	3.75	7.15	89.10
Do you clean or wash your hands after touching unpacked uncooked foods?	5.02	8.57	86.41
Do you clean or wash your hands before touching unpacked prepared foods?	7.14	15.20	77.66
Do you clean or wash your hands after touching unpacked prepared foods?	5.86	13.29	88.85



Note: Pearson correlation test shows that there were correlations between the mean scores of knowledge and practice ( $r=0.122$ ;  $p=0.004$ ).

**Figure 1.** Correlation between food safety knowledge and practice.

## 4. Discussion

The limited study linked to food safety knowledge and practices of food workers in food businesses shows food-handling complications need to be addressed. Ehiri and Morris pointed out that data on danger issues for foodborne illnesses suggest that maximum epidemics come from inappropriate food handling practices [4]. A research in USA advised that inappropriate food preparing practices donated to about 97% of foodborne illnesses in food-service institutions and households [10]. Accordingly, in order to decrease foodborne diseases it is vital to improvement an accepting of the interaction of prevailing food safety attitudes, knowledge and practices of food workers [19]. However, the working of existing food hygiene training is undefined. A number of research's Howes et al.; Powell, Attwell, & Massey have showed that an enhanced food safety knowledge does not routinely (always) result in a positive conversion in food handling practices [13, 19]. It has been advised that this difference between knowledge and practice occurs because much of the current training, mainly official certificated training, is intended using the KAP model [14]. This method supposed that personals practice (P) is dependent on personals knowledge (K) and advises that the mere delivery of information will lead straightly to a variation in attitude (A) and accordingly a variation in practice. It has been proposed that this ideal is faulty in its prediction that knowledge is the core predecessor to practical change [5, 6].

The food handlers hand can be paths in the extent of foodborne illnesses because of lower personal hygiene, viz., during using the toilet a worker might infect his hands, or microbes might be extent from uncooked meat to salad vegetables by food workers hands [8]. In our research, the food workers routinely need to clean and wash their hands, after touching unpacked uncooked foods (5.02%), before touching unpacked prepared foods (7.14%), and after touching unpacked prepared foods (5.86%) (Table 2). In addition, personal hygiene knowledge scores were low ( $17.1 \pm 14.5$ ). The outcomes show that food workers of street food in food businesses may have lack of food safety knowledge. For example, only 23.5% of food workers identified the need to clean and wash their hands after going to the latrine, handling uncooked foods and previously handling ready-to-eat food in our research (nope data). The food handlers food safety practice scores were very low ( $13.2 \pm 4.2$ ). Foods differ in component, so no single food preparing temperature is working to provide the cooking quality preferred and all food needed safety; there are many mixtures of time and temperatures required to deactivate pathogenic vegetative microbes [7, 11]. Since high temperature treatment is recurrently the critical control point a manufacturing process, the topic of low temperature understanding could be a chief burden of effective HACCP application [16]. In this research, there was absence of knowledge among the

food workers about the critical temperatures of warm or icy ready-to-eat foods, suitable refrigerator temperature varieties, and others contamination. Only 13.5% of food workers knew the accurate temperature for keeping warm food (60°C) In addition, 10.3% of food workers properly replied prepared rice as a higher threat food (nope data). In a previous study lower than half of 444 food workers knew the accurate temperature food holding warm food [16]. The food workers absence of knowledge on critical temperature in both study. As a conclusion, the outcomes of this research established that food workers in street food businesses have absence of food safety related knowledge. Therefore for all food handlers must be needed fundamental food safety training.

## 5. Conclusion

In small and large scale cooking, food is handled by many individuals, thereby increasing the chances of food contamination due to improper handling. Deliberate or accidental contamination of food during large scale production might endanger the health of consumers, and have very expensive repercussions on a country. The key steps are: Clean – keep yourself and work areas clean. Separate – keep raw meat and other raw animal products away from other foods. Cook – always properly cook and prepare foods. Chill – store foods appropriately both before and after cooking. These steps must be follow for maintain food safety.

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