



Food allergy management among restaurant workers in a large U.S. city



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ABSTRACT

We assessed restaurant workers' knowledge and practices regarding food allergy management and adverse events, which result in 90,000 emergency department visits annually in the United States. We surveyed all eligible restaurants within a defined catchment in Philadelphia and 80.3% ($n = 187$) participated. No restaurant employee was able to name all seven "best practices" to reduce the risk of food allergy adverse events in restaurants. The majority of participants could name only zero or one preventive measure. Few participants knew to respond to anaphylaxis by administering epinephrine and calling 9-1-1. Public health professionals should work with the restaurant industry, and with food service workers, to evaluate and revise food allergy-relevant policies and trainings. This is critical to protect the 15 million American consumers, and far more globally, who suffer from food allergies.

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1. Introduction

An estimated 15 million Americans and 17 million Europeans suffer from food allergies (Food Allergy Research & Education, 2014), which vary in severity and can be serious enough to be life threatening (Turnbull, Adams, & Gorard, 2014). There are approximately 90,000 emergency department visits in the United States (U.S.) annually because of anaphylactic reactions to food (Clark, Espinola, Rudders, Banerji, & Camargo, 2011).

To prevent adverse events, people with food allergies must diligently avoid allergenic foods, which depends upon food safety controls throughout the food production chain. Food allergen safety begins with producers and growers, and continues to include manufacturers, distributors, and transporters, as well as retailers,

restaurants, and consumers themselves. Food allergen guidance is provided in the Codex Alimentarius and is embedded in the principles of Hazard Control and Critical Control Point (HACCP) management systems, which offer a prevention framework for the food industry globally (Codex Alimentarius, 2015; Wehr, 1997). In the United States, the Food Allergen Labeling and Consumer Protection Act (FALCPA), passed in 2004, specifies that packaged foods must include labeling for eight of the common allergens identified by the Codex Alimentarius Committee on Food Labeling: wheat, crustacean shellfish, egg, fish, peanuts, soy, milk, and tree nuts (Gendel & Zhu, 2013; Hey & Luedemann, 2001; Kjelkevik, Edberg, & Yman, 1997; Roses, 2011). For consumers with food allergies, trust in food processing, labeling, and handling is essential to management of their potentially life-threatening chronic condition.

Food consumed in restaurants or other food service settings accounted for approximately one in four food-induced anaphylaxis deaths between 1994 and 2006 (Bock, Munoz-Furlong, & Sampson, 2001, 2007). The role of restaurants in allergy management is particularly important since food allergy prevalence is on the rise (Branum & Lukacs, 2008) and American families are eating more meals at restaurants and preparing fewer meals at home. In the U.S.

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in 2013, 49.6% of all food dollars were spent away from home (United States Department of Agriculture Economic Research Service, 2014a). Moreover, 20.8% of the food purchased away from home was procured at “limited-service eating places” (United States Department of Agriculture Economic Research Service, 2014b), where a customer orders food at a counter and does not receive table service (United States Department of Agriculture Economic Research Service, 2015).

Restaurant employees have critical roles to play in reducing the risk of food allergy adverse events. Their work requires specialized knowledge based on HACCP principles, as well as motivation to meet patrons' needs, self-efficacy to employ best practices, and resources to execute safe food allergy management protocols (Choi & Rajagopal, 2013; Muraro, Hoffmann-Sommergruber et al., 2014). The preparation of a food allergy safe meal begins even before a customer enters the restaurant, with steps that include careful review, segregation, and storage of ingredients (National Restaurant Association Educational Foundation, 2015b). Once a customer with food allergies enters a restaurant, a food service worker can employ a number of precautionary steps to mitigate risks, including having a conversation with the customer to clarify food allergies, reading food labels, using uncontaminated ingredients, and delivering an allergen-free meal using properly sanitized service ware. Diversion at any point from best practices could have serious consequences for a highly allergic customer. While most states require some form of food safety training for restaurant workers, only five states and two cities—Massachusetts, Rhode Island, Michigan, New Jersey, Virginia, New York City, and St. Paul Minnesota—require additional food allergy training and/or food allergy materials to be displayed in restaurants (Abbot, Byrd-Bredbenner, & Grasso, 2007; Food Allergy Research & Education, 2015b; Massachusetts Department of Public Health Bureau of Environmental Health/Food Protection Program, 2010; National Restaurant Association Educational Foundation, 2015a). Established training programs, like the National Restaurant Association's ServSafe Allergens online course (National Restaurant Association Educational Foundation, 2015b), describe the range of distinct steps necessary to reduce the risk of food allergy adverse events in restaurants. In addition, food service workers should be prepared to recognize and respond to food allergy adverse events when they do occur. In the event of anaphylaxis, prompt administration of epinephrine is the preferred and lifesaving emergency response (Kemp, Lockey, & Simons, 2008), which should be followed by calling 9-1-1 and transporting the ill person to an emergency room (Muraro, Agache, et al., 2014; Sampson, 2003).

Across a broad range of food service environments (e.g., restaurants, institutions) and geographical areas (e.g., United Kingdom, U.S., Malaysia, Brazil), several studies have evaluated workers' food allergy knowledge, identifying potential hazards to food allergic consumers (Ahuja & Sicherer, 2007; Ajala et al., 2010; Bailey, Albardiaz, Frew, & Smith, 2011; Choi & Rajagopal, 2013; Common et al., 2013; Shafie & Azman, 2015). These studies, which were conducted in selected populations and convenience samples, have suggested a need for improved training and better adherence to HACCP practices and allergen management among food service workers. A study conducted in a small town in the United Kingdom reported that food service workers needed additional training regarding food allergy management and that proprietors and environmental health officers lacked motivation, time, and money to invest in this issue (Pratten & Towers, 2003, 2004). Low levels of motivation and concern also were reported by Ajala et al. (2010), who studied workers at 12 restaurants in Brazil. A study conducted at a university cafeteria in the U.S. revealed specific gaps in food allergy knowledge among food service workers, including challenges in identifying common food allergens among

listed ingredients and a lack of knowledge regarding appropriate emergency response in the event of a severe food allergy reaction (Choi & Rajagopal, 2013). In Penang, Malaysia, food handlers were found to have moderate knowledge of safe food allergy management practices. For example, in that study, only about half of respondents knew that eating even a small amount of an allergen could cause a reaction (Shafie & Azman, 2015). These studies provided important early documentation of potentially serious shortcomings in allergy management in food service establishments, pointing to the need for additional research that is generalizable to other settings.

In a defined central city catchment area in a large northeastern U.S. city (Philadelphia), we conducted a survey to assess food allergy knowledge and adherence to best practices among food service workers in all eligible limited-service restaurants. Drawing from a well-defined denominator, we conducted in-person surveys, including a self-administered component, with restaurant staff, with the goal of understanding restaurant workers' knowledge and practices regarding food allergy management and response to food allergy adverse events. Our long-term objective was to identify opportunities to reduce the risks faced by consumers with food allergies—for example, through improvements in education and training and through application of behavioral economic principles to reduce food allergy adverse events. Accordingly, this study also used an embedded randomized behavioral economic experiment to test the influence of a consumer tool—a printed “consumer food allergy alert card” describing a hypothetical customer's food allergies. The experimental food allergy alert card included a photograph of a patron with food allergies. The image was intended to increase food service workers' engagement and motivation by amplifying the salience of food allergy and invoking concern for a specific customer (Blumenthal-Barby & Burroughs, 2012), just as patient photographs embedded in medical charts have been shown to increase radiologists' engagement in their work and to improve the accuracy and detail of their reports (Turner & Hadas-Halpern, 2008). Additionally, research on philanthropic giving has documented that people feel more empathy and give more to a cause when they see an associated photograph of an adversely affected individual—for example, a single hungry child (Small & Verrochi, 2009).

Below we report results from this study, which identifies knowledge gaps in the food service industry in a large northeastern U.S. city. In the discussion section, we identify links to prior research, specify gaps in the literature, note education and training needs for restaurant workers, and suggest opportunities for public health departments and food allergy advocacy organizations to further engage food service workers as allies in protecting the health of people with food allergies.

2. Material and methods

2.1. Sampling and recruitment

This study was approved by the Institutional Review Board at the University of Pennsylvania. We recruited food service workers from all eligible limited-service restaurant establishments within a designated area of Center City Philadelphia. Eligible restaurants were identified through “ground-truthing” (Sharkey & Horel, 2008), a method that relies on direct observation of existing establishments through walking surveys of the catchment area. In food environment research, ground-truthing is upheld as a superior method to the more routine strategy of identifying retail establishments through published lists of food outlets. Reliance on published lists showed a sensitivity of less than 40% in identifying operating food outlets in a recent urban food environment study

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