



Food Allergy Knowledge, Attitudes, Practices, Training Experiences and Preferences of Employees in Chinese Restaurants

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Literature Review

- Nearly half of fatal food allergy reactions were a result of food consumed away from home in restaurants and other foodservice operations (Weiss & Munoz-Furlong, 2008)
- Cross-contact, hidden allergens, incomplete food information, miscommunication, or lack of knowledge and training are frequently identified as common causes of allergic reactions in foodservice operations (Knoblauch et al., 2007; Kwon & Lee, 2012; Leftwich et al., 2011)
- Ethnic restaurants, specifically Asian restaurants, have been identified as challenging locations for individuals with food allergy (Bock, Muñoz-Furlong, & Sampson, 2007; Kwon & Lee, 2012)
- Chinese restaurants have been identified to be places of high risk of reaction by individuals with food allergy due to the cuisine's unfamiliar ingredients, hidden allergens in sauces or manufactured ingredients, and fears of miscommunication (Kwon & Lee, 2012; Leftwich et al., 2011)

Purpose

The purpose of this study was to identify the knowledge, attitudes, practices, food allergy training experiences and preferences of food handlers in Chinese restaurants.

Methodology

Questionnaire

- Adapted questionnaire from Choi and Rajagopal (2013)
- Six questionnaire sections covered:
 - Knowledge
 - Attitudes
 - Practices
 - Food allergy training experiences
 - Food allergy training preferences
 - Demographics
- Pilot-test
- Translated to Traditional Chinese, Simplified Chinese, and Spanish

Methodology

Sample

- Target population was employees of Chinese restaurants in Chicago, Illinois
- 428 Chinese restaurants identified

Data Collection

- Participant recruitment and questionnaire administration was completed in-person, April-May 2018

Data Analysis

- Descriptive statistics, t-tests, ANOVA, linear regression
- Open-ended questions translated and analyzed

Results

Response Rate

- 382 of 428 Chinese restaurants in metro Chicago were visited
- 101 questionnaires from 99 restaurants were collected
- 98 usable questionnaires were collected from 98 restaurants

Demographics

- 84% Born outside the U.S.
- 44% Prefer Mandarin, 41.7% Report *Average* English fluency
- 43% Completed high school or earned a GED
- 57% of restaurants had food allergic customers in the last year

Knowledge Results

- Mean score: 7.5 ± 2.8
- High scoring topics:
 - Identification of major allergen (83%)
 - Timeline of allergic reaction onset (81%)
 - Symptoms of allergic reaction (86%)
- Low scoring topics:
 - Items considered risky for food allergic customers (51%)
 - Reading of product label for allergen identification (46%)
 - Treatment for anaphylaxis (30.4% of 69 responses)

Attitude Results

- Mean score: 3.62 ± 1.47
- Highest attitude areas:
 - Personal importance of providing accurate ingredient information (4.13)
 - Providing accurate ingredient information will reduce likelihood of reaction (4.01)
 - Willingness to change practices for food allergic customers (4.00)
- Lowest attitude areas:
 - Placing sole responsibility of allergen avoidance on the customer (2.70)
 - Personally guaranteeing an allergen-free meal (3.32)
 - Workplace responsibility in teaching food allergens and safe food allergen handling (3.56)

Practice Results

- Mean score: 4.29 ± 0.64
- Kitchen Staff: 4.27 ± 0.68
 - Highest score – communication with other staff regarding food allergen safe meals (4.50)
 - Lowest score – reading of labels for food allergen (4.11)
- Service Staff & Managers: 4.33 ± 0.66
 - Highest score – communication with other staff regarding food allergen safe meals (4.61)
 - Lowest score – handwashing before serving food allergen safe meals (4.14)

Training Results

Training Results

- 32.7% received food allergy training
- 70.1% had food safety certification

Table 4.7. Participant mean knowledge, attitude, and practice scores with and without food allergy specific training or food safety certification

	Knowledge		Attitude		Practices	
	M	SD	M	SD	M	SD
Food Allergy Training (n = 98)						
Yes	8.91	2.26	3.79	0.47	4.60	0.48
No	6.82	2.83	3.53	0.44	4.13	0.66
Food Safety Certification (n = 95)						
Yes	8.34	2.47	3.69	0.43	4.45	0.51
No	5.89	2.91	3.46	0.51	3.89	0.77

FA Training Received Results

Table 4.5. Questionnaire participants' food allergy training (n = 32)

Received Training Items	Yes n(%)	No n(%)
I have received training to identify the major food allergens.	30(93.8)	2(6.3)
I have received training on how to read food labels for food allergen identification.	29(90.6)	3(9.4)
I have received training on how to avoid cross-contact between foods during food preparation or service.	30(93.8)	2(6.3)
I have received training on how to communicate allergen information to customers.	30(93.8)	2(6.3)
I have received training on how to handle an allergic reaction.	23(71.9)	9(28.1)

Perceived FA Training Needs Results

Table 4.6. Perceived need of food allergy training (n = 32)

Training Item	M ^a	SD ^b	n(%)				
			Very unnecessary	Somewhat unnecessary	Neither or necessary or unnecessary	Somewhat necessary	Very Necessary
Training about food allergy.	4.53	1.19	3(9.4)	3(9.4)	0(0)	0(0)	26(81.3)
Training to identify major food allergens.	4.50	1.19	3(9.4)	0(0)	0(0)	4(12.5)	25(78.1)
Training on how to read ingredient labels for food allergen.	4.50	1.19	3(9.4)	0(0)	0(0)	4(12.5)	25(78.1)
Training on how to avoid cross-contact between foods during food preparation/service.	4.56	0.95	0(0)	3(9.4)	1(3.1)	3(9.4)	25(78.1)
Training on how to communicate with customers about allergens.	4.53	0.92	0(0)	3(9.4)	0(0)	6(18.8)	23(71.9)
Training on how to handle an allergic reaction.	4.41	1.27	3(9.4)	1(3.1)	0(0)	4(12.5)	24(75)

^a5-point Likert scale used (1 = very unnecessary; 5 = very necessary)

Correlation Results

Significant positive correlations found between:

- Knowledge scores and
 - food safety certification
 - food allergy training
- Attitude scores and
 - knowledge scores
 - food safety certification
 - food allergy training
- Practice scores and
 - knowledge scores
 - attitude
 - food safety certification
 - food allergy training
 - foodservice industry experience

FA Content Preference Results

- General food allergy information
- Culturally-specific reference points about food allergy
- Trainings available in multiple languages
- Communicating with customers with food allergy
- Visual-based programs

Preferred FA Training Format Results

Format	<i>n</i>
Printed Format (booklet, poster, flyer)	24
In-Person Class (lecture, seminar, class, presentation)	16
Online Class	11
Mobile Application	4

Key Findings

- Food safety certification and food allergy training were significantly, positively correlated with knowledge, attitudes and practices
- Current training programs may not be adequately addressing the food allergy training needs of employees in Chinese restaurants
- Language and culture may be potential additional barriers to training
- Attitude scores towards food allergy accommodations were mostly positive but less so towards food allergy training
- Practice scores outpaced knowledge scores
- Training programs that also provide opportunities for future reference are preferred

Implications

- Food safety certification programs may consider incorporating more food allergy information and training to reach a broader audience
- Food allergy training programs may wish to approach communicating information in alternate ways than formal training programs to minimize perceived burden/time consumption
- Food allergy training programs that are more inclusive of the industry's different literacy levels, languages, cuisines, and cultural needs, may be helpful in improving food allergy knowledge

Limitations & Future Research

Limitations

- Findings cannot be generalized
- Small sample size and lower response rate
- Self-reported data on attitudes and practices may be subject to social desirability and avidity biases

Future research

- Larger sample
- Other ethnic cuisines and employees
- Alternate research methods
- Explore motivations and culturally-specific attitudes towards FA



Questions