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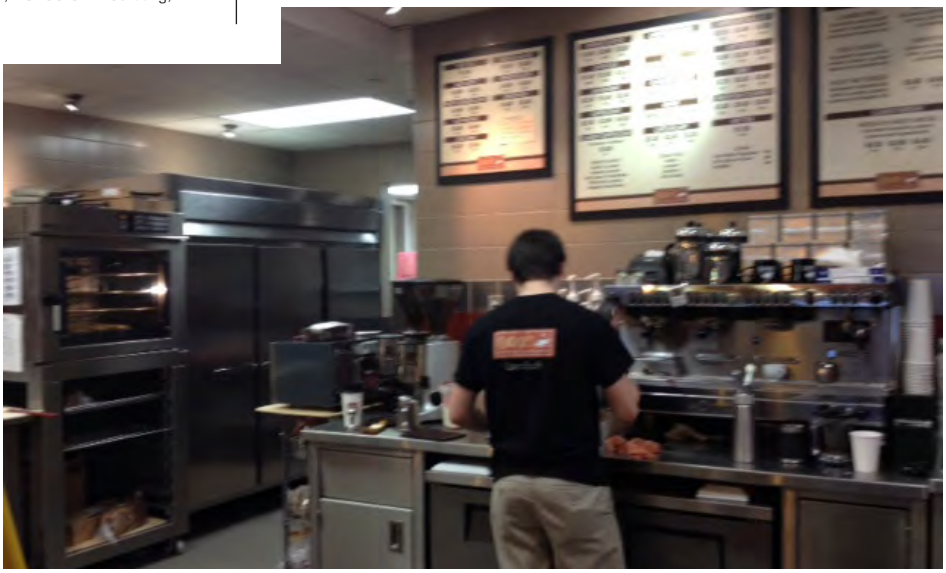

Retail Foodservice Employees' Perceptions of Barriers and Motivational Factors That Influence Performance of Safe Food Behaviors

ABSTRACT

This study identified the barriers and motivational factors that influence nonsupervisory foodservice employees' decisions to perform safe food handling behaviors. Responses to a bilingual questionnaire were received from 1,103 employees working in four types of retail foodservice. Respondents rated 8 of 16 listed barriers as important obstacles in keeping them from handling food safely, including "the work pace" (mean = 4.28 on a 5-point scale, where 1 = Not Important and 5 = Very Important) and "lack of good habits" (mean = 4.19). Using the same scale, respondents assessed importance of 27 listed items that encourage them to follow safe practices. Of the 27 items, 23 were rated at a mean of 4.0 or higher. The item rated highest was "Keeping customers safe from food-related diseases," (mean of 4.91), and the item rated lowest (mean of 3.39) was "An unsupportive work group." Results show employees know what behaviors are considered proper to ensure the safety of food; however, real barriers exist, such as time pressures and habits that are not compatible with safe food practices, suggesting that improved organization and routinization of safe food handling practices in a work culture that values food safety would reduce the risk of foodborne illness.

INTRODUCTION

The safety of food consumed outside the home is highly dependent on the food handling and cleaning practices of those who prepare, cook, and serve food. Food safety research has emphasized the importance of having an educated and trained workforce, but training and knowledge alone do not assure safe food handling by employees *(17, 19, 27, 33, 34)*.

Diversity of foodservice workforce

The United States (U.S.) workforce in retail foodservices is diverse. From restaurants to school lunch programs, employees in each segment have their own unique demographic characteristics. Industry data reported by the National Restaurant Association (NRA) *(25)* found that more than half (54%) of the nonsupervisory/

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manager workforce was less than 30 years of age. Of these, approximately 20% were between 16 and 25 years of age; however, it should be noted that the most recent NRA Industry Report *(26)* found that the percentage of 16- to 24-year-olds in the foodservice workforce was smaller in 2010 (38%) than in 2000 (42%). Conversely, the same report indicated that the percentage of those 55 and older increased from 8% to 10% during the same period. The U.S. Bureau of Labor Statistics reported in 2011 that adults over age 65 represented 16% of the entire labor force. In addition, of those employed in foodservices, the majority were female (54%) and 22% reported Hispanic or Latino backgrounds. This is consistent with information from the NRA report *(25)*; Hispanic employees held 29% of all dishwasher positions, 26% of all cook positions, and 22% of all chef and head cook positions. Wilson *(46)* found that the majority (74.2%) of hourly employees working in school meal programs in her Midwest sample were women between the ages of 41 and 60 years. College and university dining foodservices usually employ workers of a wide age range, with full-time staff of various ages and part-time college students, typically 18 to 22 years of age.

The foodservice industry in the U.S. has remained stable during the economic crisis that has affected the country since 2008. It is estimated that about half of every dollar spent on food by Americans is spent on food prepared away from home, with an average of 130 million people dining in a commercial or noncommercial foodservice each day *(40)*.

Knowledge and training of foodservice employees

Although many states require the person in charge and others involved in foodservice administration to demonstrate knowledge of food safety *(43)*, in 2008 it was found that 59% of known or reported foodborne illnesses could be traced back to mistakes made in the kitchen of a commercial foodservice operation *(9)*. It is estimated that foodborne disease, from known and unknown pathogens, causes 48 million cases of foodborne illness and results in 3,000 deaths in the U.S. each year *(31, 32)*.

The impact of a foodborne illness is well recognized by industry professionals, and the preventative measures foodservice personnel can take to mitigate foodborne illnesses have been well documented in the literature *(41, 42, 45)*. However, food safety is a complex issue that involves microbiological, physical, and chemical threats from environmental and human sources. Hourly employees are in a unique position to prevent or minimize the risk of foodborne illness from foods prepared and served to people away from home.

Traditionally, food safety training has been the mechanism used by owners and managers to ensure that food handlers are knowledgeable about safe food practices. The benefits of employee food safety training have been explored in numerous studies, although results have been inconsistent. Several studies have found that training helps to improve overall employee knowledge of food safety *(12, 15, 20, 29)*, although other studies have found that training is not consistently associated with improved knowledge *(23, 27, 47)*. Studies have also found that food safety training is positively associated with improved microbiological food quality *(11)*, increased food safety inspection scores *(13, 21)*, and self-reported changes in food safety practices *(10, 24)*.

However, observational research indicates that compliance with food safety practices is low. In 1998, the FDA *(41)* conducted an observational study to explore foodborne illness risk factors in a multitude of settings, including hospitals, nursing homes, elementary schools, and full- and quick-service restaurants. Compared with identified standards, overall the restaurant industry had the lowest mean compliance score, with the full-service industry scoring 13 percentage points lower than any other segment of the foodservice industry. In 2003 and 2008, the FDA *(42, 45)* conducted follow-up studies, and all segments of the foodservice industry were still noted for lack of full compliance. Both reports identified risk factors for foodborne illness that needed priority attention: improper holding time and temperature, poor personal hygiene, lack of chemical control, protection of equipment from contamination, and inadequate cooking. Proper handwashing was the practice with the highest out-of-compliance rate for all facility types in all FDA studies, ranging from 34% noncompliance rate for hospitals to 73% for full-service restaurants. The follow-up studies noted that compliance was higher in noncommercial institutional settings than in commercial operations. This finding was consistent with an observational study of handwashing practices in four sectors of the foodservice industry *(36)*. LeBaron et al. *(22)* reported that hands may be the most important means by which enteric viruses are transmitted; thus, frequent and proper handwashing is critical. Hand contact with ready-to-eat foods represents a potentially important mechanism by which pathogens may enter the food supply.

FDA studies also noted a 40% or higher noncompliance rate for cleaning and sanitizing practices, which can lead to contamination of foods. Proper cleaning and sanitizing of equipment was observed only in elementary schools, with 33% to 70% of all other types of foodservices being noncompliant. Cross-contamination through poor employee practices is often cited as a cause of foodborne illness. Previous research *(6)* identified the top three factors that contributed to foodborne illnesses as improper holding temperatures, poor personal hygiene, and cross-contamination. Research continues to identify these three factors as a concern within the foodservice environment *(18, 27, 29, 35, 36, 41, 42, 45)*.

Supervisors' role

Arendt and Sneed *(3)* approached food safety practices as a supervisory function. They postulated that because traditional training has been found to be ineffective at

motivating employees to change behavior, attempting to approach training at a supervisory level through employee motivation may be more effective. The researchers indicated that supervisors are vitally important in assuring that employees are following recommended food safety practices. In a follow-up study, Arendt et al. *(1)* used a mixed methods approach to develop an instrument for measuring retail foodservice employees' motivational variables related to following food safety practices. Results from the administered survey found varying influences of motivational variables on employees' likelihood to perform safe food handling practices, depending on demographic differences *(14)*. Significant differences were found among demographic characteristics of employees by gender, age, type of foodservice operation, and status of employment in their mean levels of agreement to three identified dimensions of safe food handling performance (communciation, reward-punishment, and resources). Because supervisors are responsible for communicating expectations, establishing a system to recognize or discipline good or bad performance, and allocating resources, their role clearly is critical. The supervisor's impact on a workplace culture that fosters safe food handling practices is being recognized in the literature *(28, 37, 48)*.

Emotional intelligence

The role of emotional intelligence and its effect on motivations and ability to apply knowledge are receiving increased attention in the literature *(4, 5, 8, 16, 30)*. Various definitions for the term "emotional intelligence" exist. Behnke and Greenan *(8)* proposed this synthesis: *"A measure of one's ability to use acquired knowledge, abstract thinking, and problem solving to interpret and guide personal responses to significant internal and external situations"* (p. 65). According to Goleman *(16)*, *"Emotional intelligence refers to the capacity for recognizing our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our relationships"* (p. 17). This means being aware of the emotional cues of others, showing sensitivity to others' perspectives, and helping other people when they are in need. Employers are also looking for workers who have high competence in developing others and who have high competence in service orientation, which is critical in the hospitality industry.

Behnke *(7)* found support for the hypothesis that students who rated "average high" in emotional-social intelligence have more positive attitudes toward computer-based instruction than students categorized as "low average." These findings suggest that personal attributes will influence employees' attitudes in the workplace. Attitudes and the motivation to practice safe food handling could be affected by employees' personal characteristics and attributes related to interpersonal communication, intrapersonal communication, adaptability, and stress management.

The top risks to safety of food prepared and served away from home — improper temperature holding, poor personal hygiene, and cross-contamination — cannot be avoided by training alone. For example, lack of motivation prevents employees from learning and improving in their jobs and from being self-disciplined in their work habits. Technical skills may be less important than the ability to stay motivated and the desire to practice safe food handling behaviors. Many risks to the safety of food are preventable if employees have the knowledge and the resources and motivation to practice food safety behaviors. The recognition that there is no one type of foodservice employee and that variations in demographic characteristics will impact how food safety messages are received have led to the current study. The purpose was to determine the barriers and motivational variables that influence non-supervisory foodservice employees' decisions to perform safe food handling behaviors.

MATERIALS AND METHODS

A bilingual (English and Spanish) mailed questionnaire was developed to assess nonsupervisory foodservice employees' perceptions of barriers and motivations to performing critical food safety behaviors. A pilot questionnaire was first developed from a review of the literature, including prior work completed by the research team *(1, 14)*.

Data collection instrument

A four-page booklet format was used for the questionnaire, with the cover letter included as page 1 and the return postage paid mailing information as the last page. The survey was bilingual, to reach reported high numbers of Spanish-speaking foodservice workers *(25, 38, 39)*, with two columns used to present information in both English and Spanish. Although relatively few responses were received in Spanish, providing both language options expanded the representativeness of the participating sample to include all with functional reading and written literacy in either language. This format was modeled after the presentation used in the U.S. Census survey. Participants were instructed to complete the form in the language most comfortable to them.

The first section asked respondents to assess on a 5-point scale (1 = Never; 5 = Always) the frequency with which they followed each of the listed food safety practices, such as "wash my hands." Twelve items were listed, identified from a review of the literature and researchers' own observations and interviews with foodservice employees (reported in Arendt et al. *(2)*). Participants were asked to assess the level of importance of these listed barriers in keeping them from handling food safely, such as "can't find my supplies at work" or "too busy." A 5-point Likert-type scale was used with 1 = Not Important and 5 = Very Important. Using the same

TABLE 1. Profile of respondents (*N = 1,103*)

Characteristics	*N*	%
Age range		
18 – 25 years	104	9.4
26 – 40 years	204	18.5
41 – 60 years	529	48.0
Over 60 years	266	24.1
Total	1,103	100
Gender		
Female	899	84.6
Male	164	15.4
Total	1,063	100
Type of foodservice operation[a]		
Quick service restaurant	66	6.2
Casual dining restaurant	50	4.7
Fine dining restaurant	22	2.1
School	740	69.8
College	204	19.2
Other	19	1.8
Average work hours[a]		
Less than 10 hours each week	83	7.9
10–20 hours each week	157	14.9
21–30 hours each week	451	42.9
31–40 hours each week	317	30.2
More than 40 hours each week	49	4.7
Work status		
Full-time	609	57.5
Part-time	447	42.2
Both	3	0.3
Total	1,059	100
Years of foodservice experience		
Less than 1 year	58	5.5
1–3 years	143	13.5
4–7 years	265	24.9
8–12 years	246	23.1
13–20 years	196	18.4

(continued)

TABLE 1. Profile of respondents (*N = 1,103*) (continued)

Characteristics	*N*	%
Years of foodservice experience (continued)		
Over 20 years	155	14.6
Total	1,103	100
Language at work[a]		
English	1,019	95.5
Spanish	137	12.8
Other	35	3.3
Language at home[a]		
English	896	84.7
Spanish	174	16.4
Other	48	4.6
Received food safety job training		
Yes	1,031	97.5
No	30	2.8
Total	1,061	100
Training Topic[a]		
Handwashing	988	95.6
Cross contamination	946	91.5
Cleaning and sanitizing	995	96.2
Health	877	84.8
Temperature danger zone	965	93.3
Glove use	946	91.5
Allergens	774	74.9
Not sure	39	3.8
Other	58	5.6
Maximum food safety training hours each year		
Only periodic training on-the-job	239	21.7
Less than 1 hour, formal training	47	4.3
1–2 hours	165	15.0
3–5 hours	231	20.9
6–10 hours	141	12.8
More than 10 hours	193	17.5
Total	1,016	100

[a]Multiple responses provided by respondents

scale, respondents indicated their perceptions of the levels of importance of each of 27 items (also compiled from review of literature and researchers' past work Arendt et al. *(2)*) that might encourage them to handle food safely, such as "being taught about food safety" and "a workplace that has policies and procedures on food safety." Twelve demographic questions were asked, using both multiple-choice and open-ended formats. The data collection tools and protocol were approved by the relevant Institutional Review Board.

Pilot testing

Pilot testing involved 209 foodservice employees working across the U.S., with at least 20 responding from each of four identified age groups (18 – 25 years, $n = 68$; 26 – 39 years, $n = 61$; 40 – 60 years, $n = 53$; and over the age of 60, $n = 20$). Spanish-speaking employees were recruited ($n = 25$). Based on this feedback, minor modifications were made to the questionnaire.

Study sample

The population targeted for the study was nonsupervisory foodservice employees working in specific sectors of the retail foodservice industry. A sample of 1,000 foodservice employees nationwide was the goal of a recruitment effort through the managers or directors at 100 foodservice operations: 25 quick service restaurants, 25 college and university dining operations, 25 school foodservices, and 25 fine and casual dining sites. Purchased mailing lists and membership lists from professional organizations were used to compile the database. A stratified random sample was used in the selection of foodservice operations to facilitate contacts with each relevant sector of the industry. Surveys were color-coded for each type of foodservice operation.

Once identified from the database, campus and school foodservice managers and directors were generally contacted by email and restaurant managers by phone to secure cooperation before a set of questionnaires were sent that they in turn would distribute to hourly staff. Equal proportions of operation types across the country were recruited, with variation in number of survey packets sent based on number of staff at those operations. Managers were overrecruited to ensure an appropriate response rate. A total of 7,104 surveys were distributed, with 1,412 responses, for a response rate of close to 20%, similar to that in other national surveys of retail foodservice staff *(14)*. However, 309 respondents were staff with supervisory responsibilities. Only responses from nonsupervisory staff were analyzed ($n = 1,103$).

Data analysis

Data were analyzed initially using descriptive statistics. Relationships between the predictor variables of respondents' gender, age group, years of foodservice experience, type of operation, use of the English or Spanish version of the questionnaire, and the dependent variables of their reported food safety practices, identified barriers, and key motivators were analyzed using analysis of variance (ANOVA) and *t*-tests. Correlations between reported food safety practices and barriers to following safe food handling behaviors and between reported practices and motivations to practice safe food behaviors were analyzed.

RESULTS

Profile of respondents

A profile of the 1,103 employee respondents is shown in *Table 1*. Fewer than 11% of respondents were from quick service restaurants (6.2%) or casual dining restaurants

TABLE 2. Hourly foodservice workers' mean ratings of reported frequency of food safety practices

Item	*N*	Mean[a]	SD
Wash my hands	1,069	4.93	0.39
Keep work areas clean	1,076	4.84	0.46
Use sanitizer after cleaning	1,074	4.73	0.68
Make sure food is kept above 135°F or below 41°F	1,028	4.64	0.97
Take temperatures of foods	1,042	4.40	1.28
Have customers with food allergies	1,042	3.56	1.35
Come to work if sick	1,046	2.33	1.36

[a] Rating scale: 1 = Never; 5 = Always

TABLE 3. Hourly workers' mean ratings of importance of barriers to practicing food safety practices

Item	*N*	Mean[a]	SD
The work pace	1,045	4.28	1.26
Lack of good habits	1,014	4.19	1.38
Don't think I need to follow safe handling practices	1,043	4.19	1.49
Don't have enough supplies such as gloves and alcohol wipes	1,040	4.18	1.39
No rules at work	1,045	4.11	1.45
Lack of time	1,037	4.05	1.34
Don't want to waste supplies	1,045	4.04	1.45
Can't find supplies at work	1,047	4.02	1.36
Forgetfulness	1,024	3.96	1.46
No one gives me the supplies I need	1,032	3.85	1.51
Don't know what to do	1,012	3.81	1.57
Too much work to do	1,029	3.62	1.53
Too busy	1,039	3.53	1.62
Risk losing my utensils and equipment if sent through dishmachine	1,024	3.49	1.61
Hand washing hurts my hands	1,025	3.10	1.81
Afraid of co-workers' reactions	1,014	2.78	1.65

[a]Rating scale: 1 = Not important; 5 = Very important

(4.7%), whereas K-12 schools were the identified work sites for 69.8% of respondents. The majority of respondents completed the questionanire in English (91%) and were female (84.6%). Over half indicated their work status as full-time (57.5%), although an average work week of more than 30 hours was reported by only 34.9% of the 1,057 respondents who indicated their actual number of hours worked per week. Work experience ranged from less than one year (5.5%) to over 20 years (14.6%), with the plurality indicating 4 to 7 years of foodservice experience (24.9%). Respondents were asked to identify the predominent language used at work and at home; respondents could report more than one language, so percentages reported total more than 100%. The majority (95.5%) reported that English was used at work, while 12.8% indicated Spanish and 3.3% Other. Similar results were reported for language used at home: English by 84.7%, Spanish by 16.4%, and Other by 4.7% of respondents. Almost all (97.5%) reported food safety job training had been received, with the most common response (21.7%) indicating that training was periodic and on-the-job. Five of the seven listed training topics were reported by over 90% of respondents: cleaning and sanitizing (96.2%), handwashing (95.6%), temperature danger zone (93.3%), and glove use and cross contamination (each reported by 91.5% of respondents).

TABLE 4. Hourly workers' mean ratings of importance of motivation to follow safe food handling practices

Item	*N*	Mean[a]	SD
Keeping customers safe from food-related diseases	1,091	4.91	0.43
Having gloves available	1,086	4.89	0.46
Enough towels and hand soap for washing hands	1,090	4.88	0.48
The skills to handle food safely	1,089	4.88	0.44
Satisfied customers	1,081	4.87	0.51
A workplace that has policies and procedures on food safety	1,092	4.87	0.50
Keeping customers satisfied	1,084	4.87	0.49
Equipment that works	1,084	4.86	0.47
Being taught about food safety	1,088	4.85	0.54
Information about food safety	1,092	4.85	0.51
A thermometer to take temperature of foods	1,088	4.84	0.57
Not harming the customer	1,076	4.83	0.62
Serving food that smells, tastes and looks good	1,069	4.82	0.63
Feeling like I did a good job	1,090	4.82	0.59
Training on safe food handling	1,085	4.80	0.57
A workplace that does not tolerate unsafe handling behaviors	1,076	4.75	0.71
Putting myself in the customers' shoes	1,078	4.72	0.74
A supervisor to explain what is expected of me	1,090	4.71	0.75
Knowing I'll eat the food too	1,084	4.63	0.92
Contributing to a nice looking menu item	1,079	4.59	0.87
A workplace that rewards teamwork	1,078	4.53	0.94
Time savers	1,062	4.44	1.03
A workplace that rewards those who follow the rules	1,077	4.35	1.17
A workplace that doesn't reward safe food handling behaviors	1,043	3.67	1.58
No rules about handling food safely	989	3.63	1.71

(continued)

TABLE 4. Hourly workers' mean ratings of importance of motivation to follow safe food handling practices (continued)

A health inspector who doesn't make me handle food safely	1,033	3.61	1.69
An unsupportive work group	1,035	3.39	1.67

[a]Rating scale: 1 = Not important; 5 = Very important

Reported food safety practices

Table 2 shows responses to the frequency of use of each of the listed food safety practices (with response scale ranging from 1 = Never to 5 = Always). Mean ratings of use ranged from 2.33 ("come to work if sick") to 4.93 ("wash my hands"). Five of the seven listed practices received mean ratings of 4.0 or higher.

Importance of listed barriers to following safe food handling practices

Respondents rated 8 of the 16 listed items as important (with mean of 4.0 or higher on the 5.0 scale) in keeping them from handling food safely: "the work pace" (4.28), "lack of good habits" (4.19), "don't think I need to follow" (4.19), "don't have enough supplies" (4.18), "no rules at work" (4.11), "lack of time" (4.05), "don't want to waste supplies" (4.04), and "can't find supplies at work" (4.02). The item rated least important was "afraid of co-workers' reactions," which had mean rating of importance of 2.78 (see *Table 3*).

Motivations

Using the same 5-point scale of importance, respondents assessed which of the listed items encouraged them to follow safe practices. Of the 27 listed items, 23 were rated at mean levels of 4.0 or higher (see *Table 4*). The item rated highest in importance was "keeping customers safe from food-related diseases," with mean of 4.91. The item rated lowest, with mean of 3.39, was "an unsupportive work group." Correlations among the perceptions items regarding practices listed in *Table 2* and barriers identified in Table 3 vary up to .25, for the relationship between "make sure food is kept above 135°F or below 41°F" and "lack of good habits." Correlations among the practices in *Table 2* and perceptions regarding motivations in *Table 4* vary up to .41, with the strongest correlations involving practice items of "take temperature of foods" and "make sure food is kept above 135°F or below 41°F" and perception item of "a thermometer to take temperature of foods."

Significant differences

Data were analyzed to detect differences according to employees' gender, age group, years of work experience, type of work operation, and questionnaire version (English or Spanish). Significant differences ($P < .05$) were found for at least one demographic or work organization characteristic and respondents' mean responses to almost all reported food safety practices (with the exception of "come to work if sick"), all identified barriers to safe food handling, and variables that motivate them to practice safe food behaviors (for all items except "A workplace that rewards those who follow the rules"). Additional analysis of questionnaire data is forthcoming in a subsequent manuscript.

DISCUSSION

The nonsupervisory employees responding to the survey appeared to reflect characteristics of this population as identified in NRA industry reports *(25, 26)*, although those from commerical types of foodservices (i.e., quick service and casual dining restaurants) and those speaking Spanish as the first language were underrepresented. Females do comprise the majority of nonsupervisory staff in retail foodservices *(25, 26, 38)* and were the majority of respondents to this survey, albeit with greater representation from the school segment. Commercial foodservice operations were primarily recruited by phone; while managers indicated interest in the study and willingness to distribute surveys, lower responses from employees in these sectors may be due to failure of manager to distribute surveys, lack of time to complete, fewer employees per operation, turnover of management and staff, variation in work schedules, literacy, part-time nature of their work, or lack of interest or knowledge. It is not clear whether primary contact methods used in recruitment affected the response rate. The respondents in this study were sought from a stratified random sample of the populations of facilities within each foodservice sector; variations in responses by segment of the industry may be reflective of the type of workplace. While school foodservice employees represented close to 70% of the respondents, the 30% represented by other segments does provide useful insights into variables that affect employees' perceptions of the barriers and the motivators to practicing safe food handling.

Food safety training had been received by almost all of the respondents (97%), which is higher than industry

data would suggest, and perhaps reflective of the greater representation from workers in educational settings or a desire to portray a positive image. The topics identified as covered in the trainings were linked to the top five identified causes of foodborne illness: employee handwashing, cross contamination, time-temperature abuse, glove use, and allergens. Allergen training was identified as a topic by almost 75% of respondents, which may reflect the emphasis on allergen training for line staff in recent Food Code guidance *(44)* and increasing numbers of Americans with food allergies, particularly children. With close to 70% of the respondents working in K-12 school settings, inclusion of this topic in training is not surprising. In addition, respondents working in school settings may be more aware of food safety because of required Hazard Analysis Critical Control Point (HACCP) plans as a result of the 2004 Child Nutrition Program reauthorization, and that awareness may have contributed to the inclination to respond.

Similarily, the mean ratings reported for frequency of following food safety practices are higher than those reported in previous observational research. Prior observation-based studies of handwashing behaviors in various sectors of retail foodservices, including schools *(18, 36, 41, 42, 45)*, found low compliance with handwashing frequency as identified in the Food Code, yet the respondents in this study indicated that their hands were washed almost always (4.93 mean rating on a 5.0 scale, with 5 = Always). One limitation of self-reported data is the tendency to portray positive attributes; thus positive reporting of food safety practices was expected. As past research has found *(19, 29, 33)*, those working in retail foodservices often know what should be done; however, for a variety of reasons, these practices are not implemented *(14)*. The high self-reporting of correct behaviors in this study indicates that respondents have knowledge of safe food handling practices. This is illustrated in the reportedly low occurrence of respondents who came to work when sick (mean rating of 2.33 with 1 = Never). Because lack of health benefits and sick days is fairly common in the foodservice industry, particularly for those employed on a part-time basis (as over 65% of respondents in this study were), it is expected that actual observations would dispute this finding. Thus, the challenge in motivating staff to practice what they know, and ensuring sufficient resources and support to allow them to do so, continues.

Respondents' identification of the barriers that confront them in following safe food handling practices were highly informative. Respondents were aware of what barriers prevented them from following safe food practices. Interestingly, the barriers identified as most important were related to time and organization—hectic work pace, lack of time, and lack of workplace organization. These findings suggest a need to improve work productivity, perhaps through organization of work process (such as planning more efficient ways to accomplish tasks or reconfiguring work duties) or work areas (e.g., relocating supply items so they are closer to the work location). The mean rating of importance of 4.02 (on the 5-point scale, with 5 = Very Important) for "can't find supplies at work" as an explanation why food wasn't handled safely suggests the need to focus training on how to improve the organization of employees' work environments rather than only on specific behaviors. In addition, findings indicate managers can aid in improving the practice of safe food behaviors by making supplies readily available so employees have convenient access and know where to find them.

It is interesting that the stated barriers of "don't think I need to follow safe handling practices" or "no rules at work" were rated as highly important, with mean ratings of 4.19 and 4.11, respectively. This finding suggests management could improve safe food behaviors if expectations were clearly communicated to staff. Management has the responsibility to ensure employees are aware of food safety practices and must instill a positive work culture, through established standard operating procedures and other infrastructure that communicates this message to employees. Previous work has identified that organizational infrastructure is considered by employees to be a motivator for following safe food handling practices *(14)*. Emerging research is assessing the impact of work culture on food safety *(37)*.

Management is positioned to design job descriptions, develop workplace procedures in accordance with the Food Code, and establish recognition and discipline policies for the organization. Management must also communicate this information to employees. Compliance is more likely if employees are aware that there will be consequences if they fail to follow workplace procedures. Policies guide actions and influence the workplace culture. In addition, infrastructure can temper the impact of an employee with a strong negative personality within the workforce and empower individual employees' sense of accountability and their own intrinsic motivation to practice safe food handling *(14)*. Further work regarding social dynamics within the foodservice environment is needed, particularly as these relate to safe food behaviors. One indicative finding from this study is that the importance of the role played by peers (the items of "afraid of co-workers' reactions," with mean of 2.78, and "an unsupportive work group," with mean of 3.39) both were listed last either as a barrier or as a motivator to practicing safe food handling. This suggests respondents' ambivalence regarding the role of coworkers and peers. Behnke's *(7)* examination of the relationship between emotional intelligence and hospitality students' attitudes toward e-learning found support for the hypothesis that students who rated "average high" in emotional-social intelligence would have more positive attitudes toward this learning method than students categorized as "low average." Ellis et al. *(14)* found intrinsic attributes of employees to be one of four motivational factors that influenced safe

food handling. Managers generally try to assess potential employees' attitudes toward work and the job during the hiring process, but often these assessments are based on intuition rather than evidence. Findings from this work identify the need for futher research into the impact of workers' attitudes and emotional intelligence on food safety, with inclusion of the social dimension of the workplace. The role of personality tests, particularly those that measure emotional-social intelligence, may be useful tools to ensure that only those interested in protecting the safety of food in their care will work in foodservice operations. The use of standardized tests such as the Myers Briggs Type Inventory as part of the hiring process have allowed organizations to screen effectively for the "fit" between the prospective employee and the organization, although tests are costly and typically used mostly at management levels.

Employees identified several items as important in encouraging them to handle food safely; the highest mean response was to keep customers from getting a food-related disease. Another item rated high in importance was "feeling like I did a good job." These findings indicate that employees appear to have a positive attitude reflective of a high customer service orientation or of people who care about their jobs. Job descriptions for those working in the foodservice environment should reflect this service component; hiring decisions should align with these descriptions. Managers can reinforce these attitudes through proper coaching and monitoring of performance, training, and establishment of a work culture that is customer-focused. Other high-rated items were "policies and procedures on food safety" and "a workplace that does not tolerate unsafe handling behaviors." Managers can develop their organizational frameworks through mission statements (this is what we are about), employee handbooks (these are expectations), and standard operating procedures (this is how this task should be completed) to provide the structure to ensure food safety. Managers must also monitor to ensure that these expectations are met by adherence to procedures and ensuring safe food behavior through the use of rewards and incentives.

Although respondents may not mirror the overall population of hourly foodservice workers in all segments of the industry, findings from this study showed significant differences in mean responses among survey participants based on gender, age, type of work organization, and years of work experience to almost every questionnaire item, and these differences are likely to be reflected in other segments of the hourly foodservice population. These results showing that such differences do exist suggest a one-size-fits-all approach to training probably will not be successful in reaching all employees working in retail foodservices. With increasing focus on the workplace culture to improve safe food handling behaviors, and with significant differences found among gender and age groups to identified barriers and motivators, managers need to be aware that changes in training may need to occur. Traditional training content (the "what" of safe food handling) may need to be broadened to include explanations of why this information is important and how an employee can organize work tasks and space to accomplish them. Alternatives to traditional training delivery of one-way communication either verbally or written (e.g., e-learning) should be explored to ensure that messages are received by a diverse workforce. Customization of food safety messages to nonsupervisory staff of different ages and backgrounds working in different sectors of the industry should be considered by the managers responsible for ensuring the safety of food prepared and served in retail foodservice operations.

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