ABSTRACT

Foodservice employees that fail to adhere to food safety practices may directly introduce pathogens that can cause illness and death. Therefore, the purpose of this study was to explore managerial practices that influence employee's food safety behaviors, using a two-phase sequential mixed-method approach.

A total of 642 foodservice employees currently working in the United States participated in a survey about food safety knowledge and food safety behavioral intentions. Among these, 263 were invited to answer a set of open-ended qualitative questions, 36 participants responded to the questions, and two participants were selected for in-depth interviews.

The majority of the employees are optimistic about their daily food safety practices. However, cross-analyses noted that the majority of employees failed the quiz regarding basic food safety knowledge. Further analyses documented that time-constraint and lack of managerial role modeling in daily food safety practices can post a considerable threat to maintaining food safety behaviors.

Keywords: Food safety behavior; Food safety interviews; Behavioral intentions; Managerial practices; Nest-purposeful sampling; Heuristic narratives

Leading By Example: A Three-Wave Sequential Mixed Method Food Safety Study

1. Introduction

Food safety is each employee's responsibility, but responsibility for the entire food safety program begins with the leadership (i.e., supervisors, directors, and managers) and it is delegated from the leadership to the employees (Yiannas, 2008). A food safety management system can be defined as all activities that organizations use to direct, control, and coordinate food safety; including formulating a food safety policy; setting food safety objectives; and food safety planning, control, assurance, and improvement (Luning et al., 2009; Surak & Wilson, 2007). To reduce the food safety risk and subsequently foodborne illnesses and fatalities, a successful food safety management system that complies with FDA Food Code (2017), must be established. Both survey and observational studies have reported that compliance with the FDA Food Code (2017) recommended practices was low (Green et al., 2005; Norton et al., 2015; Strohbenh et al., 2008). According to the most recent government data, approximately 61% of foodborne illness outbreaks were still attributed to lack of personal hygiene and improper food handling by employees in the foodservice industry (Angelo et al., 2016). Other reports suggested that 97% of foodborne illness outbreaks were traced back to human error or misconduct (Howes et al., 1996; Griffith et al., 2010). Moreover, most human causes could be prevented and corrected by appropriate management oversights and adequate training for preventive controls (Angelo et al., 2016).

There are different food safety management systems (Casolani, Liberatore, & Psomas, 2018; Luning et al., 2009; Panghal, Chhikara, Sindhu, & Jaglan, 2018; Rouviere, 2010). A good food safety management system identifies hazards that are reasonably likely to occur and eliminates them (Motarjemi & Lelieveld, 2013; Panghal, Chhikara, Sindhu, & Jaglan, 2018).

Some studies in the food safety literature have captured the positive and negative aspects of the managerial practices, however, few studies in the hospitality literature consider behavior which underlies the description that engages or discourages actual food safety behavior (Arendt, Paez, & Strohbehn, 2013; Lin & Roberts, 2017; Zanin, da Cunha, de Rosso, Capriles, & Stedefeldt, 2017). The foodservice complexities involved in the operations often operate in a dynamic environment, in which a range of behavioral constructs and organizational factors may directly obstruct or indirectly deter proper food safety behaviors (Arendt et al., 2012; Kwortnik, 2003, Zanin et al., 2017). The dynamic environment is frequently referred to as 'articulated crystallization' (Richardson & Pierre, 2005), which assumes a specific behavior or experience often represents a complex interaction between the environment and the constructs. Thus, the interpretation of meanings can be crystallized based on the situational cue. Therefore, a clear justification or testing cannot be given to analyze and understand the behavior left along with a group phenomenon (Richardson, 1994; 2000). Therefore, instead of using experimental studies that are summarized statistically or mathematically, this study follows a qualitative approach to help explore the questions in meaning and explanation, instead of experimenting (Jolley, 2013).

Qualitative research and mixed studies have increasingly drawn attention in the hospitality and foodservice literature due to the emphasis on meaning instead of testing, which at the end conveys a more in-depth discussion of a problem (Arendt et al., 2012; Kwortnik, 2003). Additionally, foodservice researchers began to recognize the importance of the logic-inductive process, which helps categorize behavior as a dynamic system and accumulate them in order of logic and formation (Orsini, 1999; Jolley, 2013). Despite the consensus regarding the appropriateness of a qualitative approach, most of the qualitative studies focus mainly on data quality (Mehmetoglu & Altinay, 2006), while only a small minority focus on time and length of

the data collection process with the longitudinal analytical framework (Wang and Fesenmaier, 2007). Most of the longitudinal research is done quantitatively, drawing upon a family of well-established statistical protocols that distinguishingly polished deductive philosophy (Jolley, 2013). In comparison, qualitative research protocols are rarely conducted longitudinally, take aside inductive philosophy that helps polish acceptable methodological protocols. Behaviors like food safety are likely to happen situationally and persistently, thus collecting multi-stage data and explaining idiosyncrasies within the contextual cues become more critical (Arendt et al., 2012; Walsh, 2003) and a more deepening and sophisticated interpretation of food safety behavior can be found (Richardson, 2000; Patten, 1990). Hence, the purpose of this study was to explore managerial practices that influence employee's food safety behaviors using a sequential mixed-method approach.

2. Literature review

The Center for Disease Control and Prevention (CDC, 2016) estimates that one in every six Americans becomes ill from a foodborne illness each year. In 2015, 902 foodborne outbreaks were reported, resulting in 15,202 illnesses, 950 hospitalizations, and 15 deaths (CDC, 2017). According to the most recent government data, 51% of single-setting foodborne disease outbreaks were caused by food prepared in a restaurant (Angelo et al., 2016). Collective evidence suggests that exploring effective management strategies and identifying barriers to food safety practices may be an important direction for future research (Gould et al., 2013; Green et al., 2007; Green & Selman, 2005; Howes et al., 1996; Kwon et al., 2012; Roberts et al., 2008).

Management's commitment to food safety requires first an understanding of the correct concept of food safety practices and then creating an organizational culture, structure, and

working conditions that could help empower individuals in charge of food safety to meet their responsibilities (Bai, Ma, Yang, Zhao, & Gong, 2007; Casolani & Del Signore, 2016; Fotopoulos, Kafetzopoulos, Gotzamani, 2011; Motarjemi & Leliveld, 2013). Ideally, inappropriate employees' food safety practices can be prevented or corrected by managerial control and practical training (Angelo et al., 2016). However, previous studies have provided conflicting results regarding food safety violations and the managers' role in controlling food safety. For example, Hedberg et al. (2006) reported that the presence of a manager with food safety certification significantly reduced foodborne illness outbreaks. Another study by Jones et al. (2004) noted no differences in the reported food safety inspection mean scores by individual restaurants. In other words, managerial inferences that lead to proper food safety practices are still contradictory due to limited research and understanding of effective managerial practices.

In the food service industry, improper food preparation procedures can result in sickness or worse foodborne illness outbreaks (Cliver, Potter, & Riemann, 2011). Notably, food safety policy in the United States consists of three components: risk assessment, management, and communication (Kaplan, 2012). Middle-level managers promote food safety by actively identifying hazards in the workplace and ensuring their teams are equipped to manage or mitigate these hazards effectively (Motarjemi & Lelieveld, 2013). Effective food safety management is often considered a cyclical process, which must regularly evaluate changes in threats, vulnerabilities, and possibilities of loss event impact (Davies, 2010). However, several studies have found that current food safety education provides little guidance on how to develop and implement risk evaluation routinely, and which are the effective food safety managerial practices (Abraham, Said, & Flewelling, 2018; Green & Kane, 2014; Webb, 2015). Despite the explicit instructions on how to wash hands, clean utensils, unwrap serving articles, cooling food

temperature guidelines, and pesticide applications, the food safety education provided little assurance with practical guidelines of risk analysis, risk avoidance, and risk evaluations (Webb, 2015). Thus, the barriers to effective food safety managerial practices and managers' influence on practices remain under known.

Previous studies have reported food safety training is effective in increasing sanitation inspection scores, the microbiological quality of food, and self-reported changes in food safety practices (Cates et al., 2009; Cliver, Potter, & Riemann, 2011; Hedberg et al., 2006; McElroy & Cutter, 2004). However, other studies have also identified behavioral dissonance within existing food safety training programs, as food safety training and an increase in food safety knowledge does not effectively transfer into individual food safety practices and proper preventive behaviors (Arendt, Paez, & Strohbehn, 2013; Lin & Roberts, 2017; Roberts et al., 2008, 2009; Song, Sandelowski, & Happ, 2010). As this refrain of behaviors has become even more urgent over the past decade, a surge of interest among foodservice researchers and law enforcement regulators has turned more to qualitative inquiries to identify essential practices or barriers of existing food safety management (Abdelhakim, Jones, Redmond, Hewedi, & Seaman, 2019; Arendt et al., 2013; Song et al., 2010).

Qualitative methods help provide discerned information among foodservice workers to provide different experiences and emotional states related to intended food safety behavior (Abdelhakim et al., 2019); for example, understanding individual's psychological barriers, motivations related with food safety practices, and managerial problems). This study aims to explore managerial practices that influence employee's food safety behaviors longitudinally and sequentially (Paulhus, 2002; Paulhus & Trapnell, 2008). This study design helps with explanations instead of testing hypotheses. Thus, the questions asked in this study highlight the

importance of acknowledging the need for inductive reasoning, focus on the individuals' experiences told through their own words or the exploration of the meaning through their personal content, which helps to focus on the natural perspective of the food service worker itself (Clandinin, 2006; Jespersen, Griffith, Maclaurin, Chapman, & Wallace, 2016). Specific research questions are:

What are the managerial attitudes and actions that encourage foodservice workers' compliance with fair food safety practices?

What are the managerial attitudes and actions that discourage foodservice workers' compliance with fair food safety behaviors?

3. Methods

3.1. Research Design

A sequential short-longitudinal mixed study with an interpretative narrative approach was used (Anthony & Jack, 2009; Polkinghorne, 1995). A sequential research method often involves a continuous research design, which involves multiple waves of observations over a period (Kelly & McGrath 1988, pp 135). It also contains narratives that approach the complexities and contradictions of real life in depth (Flyvbjerg, 2006). Thus, this method can be used to unpick the contextual complexities involved in motivational and behavioral changes over time and to trace and interpret the indications of change that appear across the different phases of the data collection process (Anthony & Jack, 2009; Flyvbjerg, 2006; Luck, Jackson, & Usher, 2006).

There is emerging foodservice literature using qualitative study design (Arendt et al., 2012; Abdelhakim, et al., 2019; Jespersen et al., 2016). Qualitative research can have distinct advantages as it allows to use various sources of evidence other than numerical data, and it has

the potential to uncover multiple realities by allowing participants to remain in a natural setting (Allen, 2017). The underlying assumption of the narrative approach follows the idea that individuals make sense of their world by telling stories (Holloway & Freshwater, 2009; Polkinghorne, 1995) and does not assume objectivity, but rather, it privileges positionality, pluralism, relativism, and subjectivity (Holloway & Freshwater, 2009; Riessman, 2002).

3.2. Sampling and recruitment process

The sampling process is illustrated in Figure 1. Following the sampling guideline proposed by Mertens(2014), the population level survey (Wave-1) collected 447 valid responses based on a priori quantitative power analysis (Hair et al., 2011). The collection of the Wave-1 sample allowed a criterion purposeful sampling strategy to be possible. The researchers analyzed the Wave-1 data and based on previous literature review, purposefully selected participants that met two conditions. , Respondents had to score perfect (5 = *Strongly agree*) in both *Intention to Conduct Food safety Behaviors* and *Level of Perceived Behavioral Control*, and below the satisfaction score of 75% based on *Adequacy of Food Safety Knowledge* measurement (Arendt et al., 2013; Roberts et al., 2008, 2009; Song et al., 2010).

The nest-purposeful sampling was used to focus on the select cases from a probability sample for in-depth inquiries and validate previous samples (Mertens, 2014). The nest-purposeful sampling allows the combination of both probability and purposeful sampling strategies (Kemper, Springfield, & Teddlie, 2003; Teddlie & Yu, 2007). The process helps increase the study's validity and credibility significantly (Patten, 1990; Teddlie & Yu, 2007). This qualitative approach also investigates where the numbers come from, what they mean, and which are necessary to bridge the gaps for interpretation and amend any controversial inaccuracies. This paper focuses on the qualitative part of the study (Wave-2 and Wave-3).

|| Insert Figure 1 Here ||

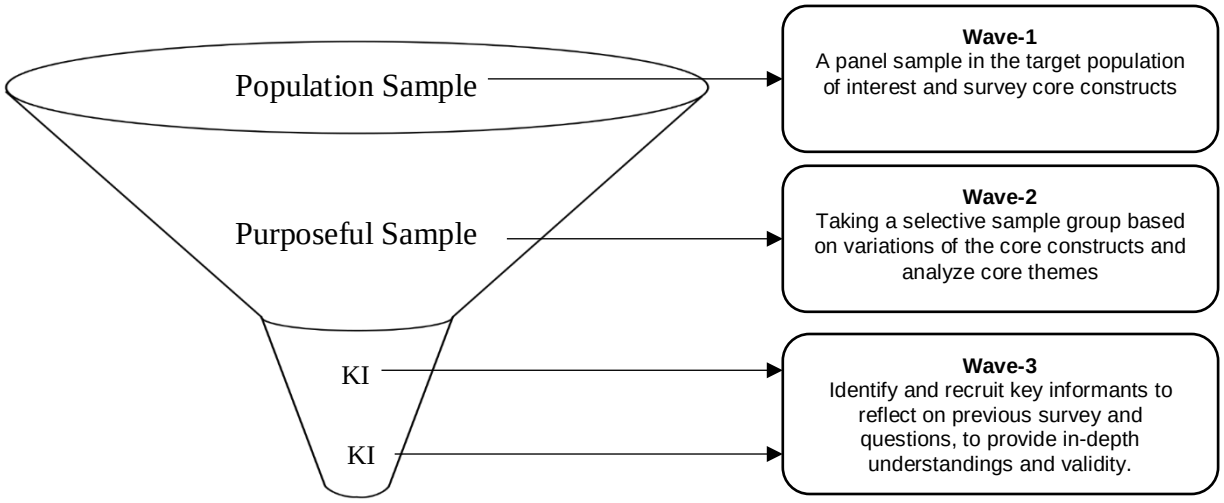

Figure 1. Nest-purposeful sampling strategy with maximum heterogeneous Key Informants (*KI*)

3.3. Pilot studies

Before data collection, the instruments used in the Wave-1 quantitative survey, and Wave-2 open-ended questions were screened by a panel (n = 4) of food safety researchers for face validity and content clarity. A pilot test was conducted with a convenient sample of 24 restaurant employees close to a 50-mile radius from a Midwest university. With 23 valid responses collected during the fall of 2017, the suggestions to improve question clarity and time spent on the response was documented. The pilot study helped improve wording on three prescreening questions and four attention check questions to ensure smooth flowing of the online module and avoid fraudulent responses. Additional demographic questions were added to help document non-traditional foodservice venues, like ice-cream/ coffee shop, community deli, or catering.

3.4. Data collection

3.4.1. Wave 2

A panel of foodservice employees in the United States was used during a five month data collection period; allowing three waves of purposeful sampling collection after each wave of analysis was completed. First, a representative sample of people (n = 642; wave-1) with foodservice experience was surveyed to document their diversity and priorities based on behavioral constructs (Bock et al., 2005; Fishbein & Ajzen, 2011) and food safety knowledge (Roberts et al., 2008). The constructs of interest included the intention to conduct food safety behaviors (Bock et al., 2005), perceived level of behavioral control (Fishbein & Ajzen, 2011), and adequacy of food safety knowledge (Roberts et al., 2008).

Respondents with the highest two behavioral constructs and with low food safety knowledge scores (n = 263) were invited to participate in the qualitative data collection process (Wave-2) by answering a set of open-ended questions. Specific questions are listed in Appendix Table 1. After reflecting and analyzing the open-ended questions, two key informants were identified and interviewed (Wave-3).

3.4.2. Wave 3

During the Wave-2 analyses, three main themes emerged and drew attention for in-depth discussion. These themes are "manager's role modeling, especially hands-on behavior," "proper reward and punishment for employees, especially cash rewards," and "committed or negative communication style, especially rude or uncommitted attitudes." Three sub-themes were worth mentioning, which include how to provide proper training for employees, busyness, and when the work needs to be rushed, and customer's return and profitability related to good food safety practices.

Using the developed themes for interview guidelines (Glaser, 1992; 2000), two participants from Wave-2 were purposefully selected and contacted for in-depth interviews. To

facilitate comparison and discussion, both participants were from casual dining restaurants, with proximity geographic IP location, and both had more than ten years of working experience. However, the interviewees differed in gender, education background, and current position as an employee versus a manager.

One day before the interview, the researcher phoned to ask for permission and ensure anonymity. Moreover, a set of opening questions was developed which help probed the worker's heuristic memory of the work environment, the daily food safety practices, and the timing of the practice. A grand tour of the questions was also used ("I would like for you to tell me about the restaurant you worked in," "What roles you played related to food safety?"). The grand tour which helps inspire curiosity and cultivate reflectivity among workers helped document the diversity to translate any meaningful patterns or theme revisions for later interviews (Braun & Clarke, 2006; Daly et al., 1997).

The heuristic narrative interview method was used to help reflect the current presenting personal work experience in hoping to discover the meaning, structure, and essence of food safety behaviors among workers. The focus also helped validate the accuracy and meaningfulness of the previous quantitative study at Wave-2, provided a more detailed explanation and insights for numbers at Wave-1. Theoretically, it is essential to validate and explain existing classifications that are distinct among different professional groups, and individual's psychological states, and look for additional variances that help explain and enrich the existing theory constructs of behavioral change (Anderson, 1983; Brockner & Rubin, 1985; Cialdini, 1988; Ditto & Lopez, 1992). There are also practical implications for validating the accuracy and meaningfulness of the previous studies, the understanding of effective management

practice will help develop economic interventions to tenacious food safety practices (Daly, 2007; Patton, 2002, 2015).

The interviews allowed participants to provide an in-depth explanation of the important themes, meaning, and interpretation, which allowed coding to be more reflexive and validated the previous attributions of situations and analyses in Wave-2. The sample size was considered sufficient following the guidelines of the Mixed Methods International Research Association (Mertens, 2014).

3.5. Ethics and rigor

The Institutional Review Board from a Midwest university evaluated and approved the research protocol for the quantitative survey (Wave-1), qualitative survey (Wave-2), and interviews (Wave-3). Survey participants were recruited online by a marketing company from a food service panel. The food service employees were verified geographically and anonymously using IP addresses. Participants also went through a set of pre-screening questions to ensure qualifications. The recruitment process ensured multiple phases of distribution in different months of 2018 to control for potential common method variances (Podsakoff et al., 2012).

The following techniques were used to establish trustworthiness, as described by Lincoln and Guba (1985). Member checks were conducted by having two food safety experts review and comment on the overall adequacy of this report. Also, an audit trail that included the digitally recorded demographic profiles, narrative texts, verbatim transcripts, coding template, data collection notes, and analytic memos were developed and reviewed independently to establish credibility. Transferability was addressed with the use of purposeful sampling and a thorough description of the context in the open-ended questions. A second reviewer with expertise in

qualitative analysis using the audit trail enhanced the rigor of the process and credibility of findings.

The researcher team aimed to find common themes while minimizing their own biases and pre-understandings (Hesse-Biber, 2007). The analytical process and verification began as soon as the initial data was collected. The elaborated coding was then insured in subsequent interviews with quantitative scores to establish triangulation of the data. Codes were then grouped into concepts-based themes to examine self-reflection and neutrality of interpretation (Patton, 1991). Theoretical saturation was used as a state known when no further themes were found (Glaser, 1965). Finally, the team linked concepts to one another and provided visualization of the themes for documentation and accuracy.

3.6. Data analysis for Wave-2

3.6.1. Data management

Qualitative narrative analysis techniques were used to analyze the data (Wave 2 and 3; Clandinin & Connelly, 2000; Riessman, 2002; Polkinghorne, 1995). The units of analysis were sentences or paragraphs. A computer-assisted qualitative data analysis software (CAQDAS), ATLAS.ti (Version 8.0) was used to facilitate the organization and maintenance of the data.

3.7.2. Data analysis for Wave-2

The analysis procedures followed hermeneutic meaning and interpretation (Dinkins, 2005; Strauss & Corbin; 2017). The whole analytical process is summarized in Table 1.

|| Insert Table 1 Here ||

Table 1. Phases in the analytical process.

Wave-1	Wave-2				Wave-3		
Focus on the trends within the data and possible connections	Focus on the material generated from participants				Focus on the individual participants' experiences		
	Stage-1 Exploration	Stage-2 Specification	Stage-3 Reduction	Stage-4 Revise	Reflection of interpretation	Play the role of co-inquirers	Flow into Personal Questions
Identifying patterns, similarities, and differences within the quantitative data and trying to identify pre-existing patterns for advanced inquiries.	Forming an overall impression of the data, trying to become immersed in the content	Generating natural units of meaning, identify the important themes relevant to the question.	Relating natural meaning units to central themes and identifying sub-themes. Also, decide the candidate theme of focus	Chronological reading of subthemes addressing changes of perception within each theme and determine refinement.	Chronological reading of themes and subthemes in Wave 2 and take the idea from hermeneutics and related to interviews.	Interviewer plays the role of co-inquirer and engage in shared dialogue and engage in interpretation to allow participants' rationale to be in-depth and reflecting.	Interviews then proceeded to more personal questions of belief and the nature of the relationship as manifest to summarize hermeneutic truths.

Note Analytical process influenced by Dinkins, C. S. (2005). Shared inquiry: Socratic-hermeneutic interpret-viewing. Beyond method: Philosophical conversations in healthcare research and scholarship, 4, 111-147 and Freeman, M. (2011). Validity in dialogic encounters with hermeneutic truths. Qualitative Inquiry, 17(6), 543-551.

Analyses began with an independent review of the data, including notes, narratives, and transcripts; by two researchers. Members of the team read through the narrative texts and began to note patterns and themes as they first appeared. These trends and patterns then served as the foundation for generating themes. Emerging themes were applied to each transcript. The team made refinements, either elaborating or expanding codes or omitting those who did not appear in subsequent interviews to ensure that the coding accurately illustrated the data.

Initial themes were labeled and defined by consensus meetings and agreed among researchers. Comparisons were made within and across participant data during coding. The methodological procedure and the development of hermeneutic unit were documented (Sandelowski, 2000).

3.6.2. Data analysis Wave-3

The analysis procedure for Wave-3 followed Gadamer's hermeneutics. According to Gadamer (1989), a topic may be more fully understood through the dialectic process of questions and answers, and by conducting the dialogue as a genuinely open conversation. By taking the idea of interpretation from hermeneutics and relating it to the Wave-3 interview, the researcher, and the participants played an important role for co-inquire and engaged in shared dialogue that evolved the questions and responses. However, investigators kept in mind the "neutrality"—showing interest and offer encouragement nonjudgmentally probe, offered the present mindset, and meanwhile prepared for the unexpected. The interpretation process was carried out by constant reflexivity and re-examination of the existing pre-understanding of the authors in the light of new understanding offered by the participants. Before each new interview, a simultaneous process of listening to and reading narratives of the previous open-ended questions was completed (Kvale & Brinkmann 2009). After the interviews, the researchers' immediate

impressions were recorded in field notes, allowing transcriptions and themes to be more reflexive. In this study, data were regarded as 'Texts,' which comprised the recordings, the transcripts, and research field notes and method memos, e.g., reflections concerning participants' tone or micro-expressions. An understanding was gained through dialogue with the text involved listening to the soundtracks, while concurrently analyzing the transcribed research interviews. A greater emphasis was given to the shared dialogue rather than non-directive questioning, so that interviewer can go in-depth to ask for participants' reasoning and rationales related to their experiences. The overall analytical process focused on the diversity of understanding within the hermeneutic circle. The flow table (Table 1) helps illustrate the analytical process and led to an overarching interpretation of the managerial influences as described and understood by the participants, as well as the potential connections between them (Dinkins, 2005; Freeman, 2011).

4. Participants' Demographics

A total of 263 participants from Wave 1 were purposefully selected and invited to participate in the Wave-2 of open-ended questions. A total of 20 participants responded (7%), after examining the responses, three participants were excluded due to drop-out, leaving 17 valid responses with an 8,620 narrative word count useable for the qualitative analyses.

The principal investigator collected the data using a set of opening questions which helped probe the worker's heuristic memory of the work environment, the daily food safety practices, the timing of the practice, and barriers and facilitators to the practices (Creswell, 2013; Marshall & Rossman, 2010). There was no time limit to the question. Qualtrics® also recorded response time for each participant, which is taken into considerations during analysis. After

reflecting and analyzing the open-ended questions, key informants were selected and carried into a one-on-one interview in the Wave-3 data collection process to allow inquiries to provide an in-depth understanding of previous data. The basic demographics and characteristics of participants, including key informants, are listed in Table 3.

|| Insert Table 3 Here ||

Table 3. Characteristics of Wave-2 Participants (n = 17).

Age (Yrs)	Gender	Restaurant Type	Food Safety Certification	Highest Education Level	Full-time Employment Status (Y/N)	Years in Industry	Food Safety Scores**
64	Female	Fine Dining	ServSafe	Bachelor's Degree	Yes	45	55.6%
33	Male	Fine Dining	ServSafe	Bachelor's Degree	Yes	6	66.7%
27	Female	Quick Service	ServSafe	Some College	Yes	7	61.1%
28	Female	Quick Service	Other*	Some Highschool	Yes	10	55.6%
51#	Male	Casual Dining	Other*	Highschool Grad	Yes	10	66.7%
47	Male	Casual Dining	ServSafe	Bachelor's Degree	Yes	13	66.1%
57	Female	Dining Hall	ServSafe	Highschool Grad	Yes	13	66.7%
25	Male	Quick Service	Other*	Highschool Grad	Yes	6	66.7%
44	Male	Dining Hall	ServSafe	Some College	Yes	20	66.7%
27	Female	Casual Dining	ServSafe	Bachelor's Degree	Yes	18	61.1%
44	Female	Quick Service	Learn2Serve	Some College	Yes	10	66.7%
57	Male	Fast Casual	ServSafe	Some College	Yes	35	72.2%
32	Male	Fast Casual	ServSafe	Highschool Grad	Yes	12	66.7%
43	Male	Quick Service	ServSafe	Bachelor's Degree	Yes	20	61.1%
37#	Female	Casual Dining	ServSafe	Bachelor's Degree	Yes	19	66.7%
27	Female	Casual Dining	ServSafe	Bachelor's Degree	Yes	2	66.7%
44	Female	Casual Dining	ServSafe	Some College	Yes	25	66.1%

Participants marked with # were selected as key informants.

*Other Food Safety Certification include: Illinois manager certification; Food Service Manager; Food Hander's Card; NYC department of health food handler license

**Adapted from Roberts and Barrett, 2008 food safety knowledge test.

Note: Yrs = Years; ServSafe is a registered trademark owned by the National Restaurant Association Education Foundation, which requires a 75% or above to pass; Learn2Serve is a registered trademark of 360training.com, which requires a 70% to pass, and is sponsored by USDA food safety inspection service and FDA center for food safety and applied nutrition; Quick Service = Quick Service Restaurant often as known as fast food restaurant; Casual dining restaurant including family-style restaurant; Dining Hall including school or government-assisted food service programs.

5. Starting the stories: discussion of themes and reflexivity

A thorough literature review of previous research informed our preunderstanding. Some major issues seemed prominent in the prior literature regarding food safety management: Educational programs related with necessary training or certification, employee's intrinsic motivation and willingness to perform food safety behaviors, and managerial influence to improve communication, rewards- punishment, and resources (Arendt et al., 2012; Arendt, Paez, & Strohbehn, 2013; Roberts et al., 2008; Song, Sandelowski, & Happ, 2010). We assumed that these issues would be relevant to foodservice managers, but did not know how important, how managers would approach these issues over time, and the relevant impact these issues might have towards the overall effectiveness of the food safety practices.

Our preunderstanding was challenged in several ways during the study. During an interaction with one of the restaurant managers who experienced a subpar food safety environment, several new topics were raised as significant to the managerial practices. For example, he always referred to their food safety practices as an excellent or top-of-the-notch, which surprised the researchers, because the results of the previous survey repeatedly indicated a deep understanding of the essential food safety knowledge. The American Merriam-Webster dictionary noted being excellent is closely related to exceptional and superior standards. The participant's introduction of the term challenged the researchers to reflect on how presumptuousness and lack of awareness of food safety standards, lack of refreshing food safety causes, and stagnation in improving food safety practices can cause problems in the system.

Repeated inquiry design helped provide an opportunity to challenge and elaborate on current preunderstandings continually. For example, during the interview with one of the key informants, a comment was consistently made that some of the managers on the team pressure

speed over safety (as reflected in Appendix Table 2, business priorities were co-occurrent nine times with prior training). Thus, the reflection challenged the researchers on how the overwhelming feeling of rush hour busyness, the pressure of delivering on time and being honest of following steps in a sequence can pose psychological burdens over deliberated safety practices. The change of experience and reflecting among researchers was a key to grasping the participant's experience about the attitudes and barriers related to food safety practices.

The understanding of participants' experience developed gradually through three waves of data collection and was closely associated with three core themes that underwent the interpretation that was attached to these experiences. An overall elaboration of the essential meanings of the three-core themes family is presented in Figure 2. The transitions between core themes families were gradual, which are explained in more detail later in the discussions. Overall, the focus and content show how food safety experiences and understandings were modified over time, and the phases suggest when the various transitions took place.

|| Insert Figure 2 Here ||

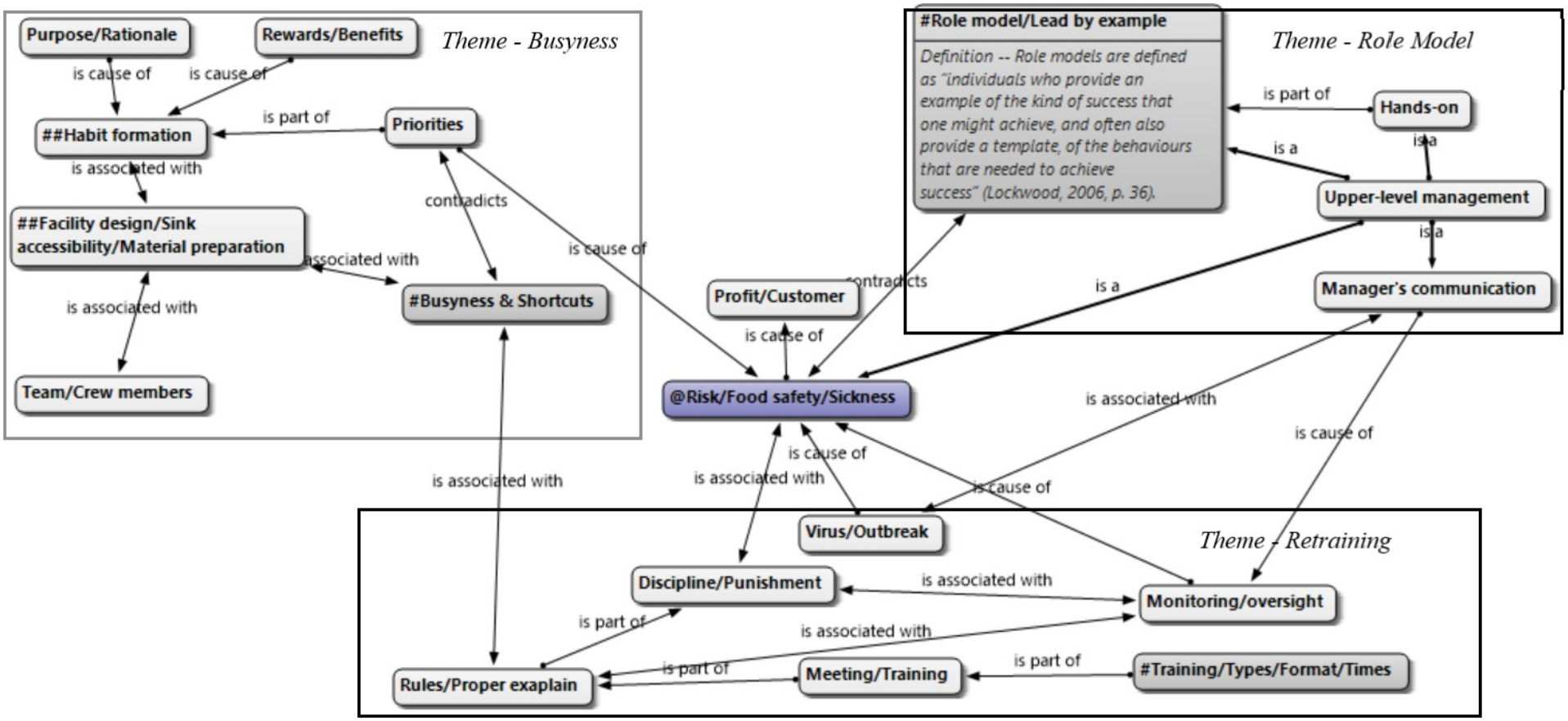

Figure 2. Correspondence plot of qualitative data with themes and sub-themes in the foodservice industry.

5.1. Theme one – Busyness: The danger of taking shortcuts and 'customer-first.'

Regardless of one's attitude and training toward food safety behavior, the influence of one's physical environment and organizational structure can make a difference in whether one follows food safety. The busyness is defined as a state of having lots of activity and doing lots of tasks all at once (Merriam-Webster, 2013). As one of the participants stated: "*Every once in a while, it gets so busy that we are tempted to cut corners and do things fast instead of right.*" [KI, 2]. The experienced manager tends to notice the danger of putting speed over safety. Male, 46-years-old, with 30 years' experience in the industry stated: "*Busyness, sometimes when you are in the weeds food safety will become less important than earning the tip.*"

Other employees thought it is okay to forfeit safety if it is about making the customer happy. A female, 36-years-old, stated, "*I think sometimes we are very busy, and we are expected to take care of customers first. Customers do not like waiting for you to wash your hands first.*" "*Pressure to get the food to the customers as fast as possible*" [Female, 57]. As the customer-oriented service can be deeply rooted in the company philosophy, some employees expressed their concern. "*As being said that when it gets busy, it is acceptable to work rushed, which can lead to critical mistakes.*" [Male, 43]. "*… that you are jeopardizing the health and well-being of your customers as well as your crew members*" [Male, 57].

Some of the reasons for not following food safety practices were mentioned, for example, "*Lack of proper time, and lack of cooperation from coworkers, to ensure all food safety rules are followed.*" [Female, 39]. "*Customers do not always understand why someone is cleaning instead of waiting on them*." [Female, 52]. Others mentioned there might be a lack of staff on shift, "*If they are too busy to keep up and still work clean, it is possible that I have not scheduled enough*

people for that shift." [Female, 37]. A network view and a brief relationship of the sub-themes are illustrated in Appendix Figure 1.

5.1.1. Subtheme: Facility design and physical inaccessibility

One of the subthemes related to excess busyness and not being able to follow food safety-related to working-environment and physical inaccessibility. One Female, 36-years-old, explicitly stated: *"Having accessible sanitation buckets. Also, a close sink helps. It also helps when you receive support from your co-workers and supervisors." "Sometimes the dishwasher breaks down. A number of the sinks get clogged easily, and our paper towel dispensers often break*." Others stated the same problem, "*Sanitation materials and hand wash sinks are too far away or inaccessible*." [Male, 53]. "(*The best way to encourage food safety is to have) handwashing sinks, single-use towels, hands-free hand sanitizer, sanitizer spray/buckets within easy reach to wipe down surfaces."* [Female, 37]. Other participants stated the importance of having written rules visible when conflict happens. Also, having good team players to keep things accountable and serve as reminders during rush hours.

5.1.2. Subtheme: Understand the purpose and forming habits.

One of the strongest subthemes to avoid taking shortcuts and forfeiting safety practices is to understand the purpose and forming food safety habits at all times. "*Time constraints placed upon is by management and customers make following safety rules more difficult, but if we follow the procedures from the start, they just become part of the routine and barely a second thought*." [Female, 41]. Moreover, an important part of forming habits is deliberately practicing them. "*It (food safety) becomes a habit and second nature if you practice these skills all the*

time" [Female, 29]. *"Just not being used to the routine… If you are used to it, it comes part of you.*" [Male, 46]. Other participants stated some managers provide rewards (i.e., cash bonuses; employees of the month) when workers perform well on food safety and keeping the kitchen clean. Also, some workers concluded having a sturdy heart for service and having a higher purpose of keeping both customers and co-workers safe, would also lead to effective daily habits.

5.2. Theme two – Role model: Managers should also walk the walk and hands-on.

Role models are defined as "individuals who provide an example of the kind of success that one might achieve, and often also provide a template, of the behaviors that are needed to achieve success" (Lockwood, 2006, p. 36). Regarding success in food safety, a conceptual example can be someone whose actions you respect and whose behaviors and habits inspire you. An operational example could be someone who can display skills, techniques, career commitment, and professional behavior. As one of our key informants stated, "*Setting a proper example for employees is the best way to ensure staff will follow the necessary procedures. Managers should be following all procedures and lead by example. If managers do not follow the procedures, employees will not be as efficient to follow them either. Employees should be looking up to their managers to teach them how to perform those tasks, and by proper managing, employees are more likely to follow and do it themselves."* [KI, 1].

Other managers agreed upon being "*hands-on*" means being effective. "*The kind of managers that make it easier to follow the practices are the ones that set the example and actually do it themselves.*" [Male, 57]. "*Hands-on managers are always easier to follow in any practice. managers who are willing to work side by side with their employees and lead by example always make it easier for employees to follow their lead.*" [Male, 43].

Not all managers are willing to walk the walk and communicate, thus leaving employees confused and difficult to follow suit. *"I have had a manager only once like this refused to communicate with anyone. The manager is rude or uncommitted."* [Male, 43]. "*if a manager is not following those practices, and that would be confusing to employees and make them not follow instructions*." [Female, 44]. Thus, regarding effective food safety role-modeling, managers need to be accountable and willing to communicate. "*Communication and self-awareness are the most important characteristic of a manager. If they are Accountable, straightforward, and thorough in their methods, then employees will follow*" [Male 46].

Other participants thought that the communitive and accountable managers also prevent foodborne illnesses and outbreaks, thus keep bringing customers back. A common impression among participants was good food safety brings customers back, and leads to profits. "*To prevent the spread of disease and illness and make customers want to return and tell their friends positive things about the restaurant*." [Male, 44]. "*Customers will notice that and post it on social media, and the other is a serving heart have work experience and school experience in the field of work experience.*" [Male, 43]. According to the participants, in the long run, customers tended to feel the difference of cleanness and became loyal to the restaurant. An ideal map for the relevance of role modeling and manager's communication effect is presented in Appendix Figure 2.

5.3. Theme three – Re-training: The importance of hands-on training and following through

One of the biggest challenges to food safety is training and how to motivate behaviors after training. Like one of our participants stated: "*The food safety courses are a joke and not required to renew very often. It is mostly just a tax on people's mind and time."* [Male, 46].

Other concerns include: "*Honestly, we did not receive any official training; we could use official training. All of us tend to get thrown into our positions, and since there is no standard for training, everyone does things differently."* [Female, 36]. The initial survey reflected complaints and distress regarding current food safety training. Thus, this topic was carried further in Wave-2 and Wave-3 and deliberately asked for methods and ways to improve training and seek the definition of effectiveness in food safety training.

Effective food safety training can be defined by the importance of retraining and physically following through at practice. The purpose of retraining is not to repeat the initial training, but an evaluation of how well the employees have learned (Cliver, Potter, & Riemann, 2011). As one of our key informants stated: "*Any training has a period; we should follow them after training, and retrain them through work, even the supervisor. Employees are trained upon hire and throughout work. We (managers) regularly have training, so this helps us stay relevant to food safety.*" Interesting the other key informant, also mentioned, "*They (employees) pass the training that doesn't mean that they're doing anything practical. And one aspect to change is doing a follow up with a practical instructor, actually visit their restaurant and watches them.*"

Then, we asked for how to improve current training methods. Some managers suggested "*Hold training on the practice. Revisit practices on a quarterly basis and go over any new ones.*" [Male, 46]. "*Food safety training provided (should) be very thorough and followed at all times. Food safety classes would help as well, maybe some held right on property in the kitchen instead of somewhere in a classroom to give employees better ideas and understanding of them.*" [Female, 44]. Overall, the participants placed important values of training effectiveness on periodically training, the refreshing course provided by managers, and physically following through at practice. Some of the participants thought it is crucial for managers to keep them

updated, provide a proper explanation of the rules and do punishment if other employees did not follow suit, e.g., having a 'three-strike rule' in the kitchen, and being fair and apply to everyone including managers. A view of the themes is presented in Appendix Figure 3.

5.4. Limitations

This study aimed at obtaining in-depth knowledge of managerial influence on food service employee's food safety behaviors. However, the attrition rate of longitudinal design, as well as the limited number of participants in Wave-2 of the study, is a limitation in this study. Future research should strive to control the attrition rate with limited selections of key informants and thus help increase the quality of the study and generalize the results to the public application to foodservice industry. Another limitation involves conducting the open-ended survey via the internet, thus limiting the caption of the nonverbal language of the participant. However, to minimize this effect, Wave-3 interviews were digitally recorded, and tone deflections were noted as memos in the analyses. Future research could consider using facial filters by capturing facial expressions while conceiving participant identity (IRB requirements).

Although the sequential design and wave of data collection were built on the previous section, the analysis is usually a recursive process, with development back and forth between different steps (Nichols & Maner, 2008). The result of a circular analysis would highlight the most salient gatherings of meanings present in the dataset but also reflect on the researcher's theme-relevant materials, thus presenting a risk of hindsight bias. For example, a longitudinal study or repeated questions with someone makes it more likely they will produce more theme-relevant materials. Lastly, there was a time delay between participation in Wave-1, 2, & 3, which may have limited the recall memory. We tried to minimize this potential threat to

credibility by asking participants to think about the previous survey, and at the beginning of the interview, a set of grand tour questions were used for reflection (Braun & Clarke, 2006; Daly et al., 1997).

Recent research has investigated the importance of values-orientation of hires in the protection of public safety and food safety (Medeiros et al., 2012). Some results indicate that human resources play an important role in the provision of safe food through professional procedures for recruitment, selection, evaluation, and training of their employees. Although our participants acknowledged the importance of evaluating and training in food safety, future studies should also consider investigating the food safety challenges in the recruitment and selection phases of the employees, especially employees with correct value-orientations.

6. Conclusions

This study consisted of a sequential mixed investigation into the effective managerial practices that influence employee's food safety behaviors. Three core themes were identified. Comparing our findings with previous studies (Arendt et al., 2013; Song et al., 2010), the study results noted some crucial areas for improving practices. Firstly, food safety management might require managers to be the role model for the success and be physically engaged in displaying activities that demonstrate correct skills, techniques, and commitment toward professional behaviors. Especially, food service managers could be expected to supervise the practice at work, monitor the employee behaviors on site, and have written rules visible when conflict happens. Additionally, managers would consider identifying high profile employees to keep things accountable and serve as "watchers" during rush hours. Some motivations including cash bonuses or employee recognitions could be considered as practical tools for creating daily habits.

Data from the results of this qualitative study highlighted the urgent need to improve food safety practices during rush hours or when the restaurant is bustling. The key informants identified two reasons to forgo food safety; not enough staff scheduled for the shift and the need to serve the customers promptly. Opposite to the popular business model, which puts speed over safety (Lashley et al., 2007), participants (wave-2) noted that a restaurant that puts food safety first often makes happy customers, thus brings long-term profits. Future research could consider testing an economic model to compare quantifiable economic factors and relative monetary gains by promoting food safety.

Additional practical implications for the success of food safety management are noted. Managers must take accountability for their personal actions while being actively engaged and practice their role models. An open communication environment and adequate on-site monitoring by managers could contribute to the improvement of employees' food safety behaviors. Also, most of the food service workers place high values on periodically training and hands-on training. The study results have noted that timely, appropriate retraining or refresher courses are essential managerial practices and key to success. Future qualitative researchers could consider a research approach to investigate more about managerial training and effective periodical training methods.

Another implication includes the physical monitory system in the employees' work environment. The study results have noted that employees feel that managers are obligated to physically follow suit and keep them updated about food safety practices. Managers also must provide the necessary boundaries by establishing a clear explanation of expectations with rules and consequences for not following them. Managers must play fairly and apply the rules to everyone including the managers.

Most managers (Wave-2) agreed that following-up after training, and being able to monitor practices at work, is one of the critical elements needed to improve the current food safety training programs. One suggestion for restaurant managers is to pay emphasis on hiring practices and determine employees' commitment to food safety as earlier as in the recruiting phases. Managers should hire workers with devotion to service and stimulate a culture for keeping both customers and co-workers safe, which would also lead to effective daily habits and successful food safety management.

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