



Child Care Food Safety Hand Hygiene: The Role of the Director

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Abstract

In the United State over 15 million children attend a childcare facility annually. These children are 3.5 times more likely to contract a foodborne illness than children cared for in other settings. Proper hand hygiene practices have been identified as the most important practice to mitigate the spread of foodborne illnesses. Thus, the aim of this study was to explore hand hygiene training opportunities given to childcare food handlers in childcare facilities; as well as explore what food safety training childcare directors currently possess. Results showed directors received food safety training yet did not always pass the training along to their employees. A lack of written hand hygiene policies was identified, as well as lack of childcare employee training for hand hygiene on the topics of hand washing and glove use. It is recommended that childcare directors communicate the importance of proper hand hygiene through microlearning food safety interventions.

Keywords: Childcare; Food safety; Foodservice; Hand hygiene; Training

Introduction

Food safety

Though ample research has been conducted pertaining to food safety and handling practices with numerous interventions tested, foodborne illness outbreaks continue to persist. The four pathogens identified most often in foodborne illness outbreaks are Norovirus (5.5 million), *Nontyphoidal Salmonella* spp. (1.0 million), *C. Perfringens* (1.0 million), and *Campylobacter* spp. (0.8 million) [1]. Of the approximately 5.5 million cases of Norovirus annually, 149 cases result in death and costing over \$2.2 billion in economic burden [2]. Among American children under five years of age, Norovirus has been the leading cause of medical visits for acute gastroenteritis [3] and costs an estimated \$273 million due to 14,000 hospitalizations, 281,000 emergency room visits, and 627,000 outpatient visits annually. Aside from the economic burden, foodborne illness can lead to severe short-term and long-term health consequences, such as vomiting, diarrhea, organ failure and, in some cases, death.

Childcare food safety

Annually, over 15 million children attend a childcare facility in the United States [4]. On average, these children spend 33 hours per week in some type of childcare facility [4]. Many childcare facilities provide breakfast, lunch, and snacks. Some facilities had designated foodservice employees, while others utilize teachers or parents to supply or prepare food. Each of these methods may be susceptible to unsafe food handling practices resulting from improper hand hygiene.

Research has shown children are 3.5 times more likely to contract FBIs in childcare facilities compared to children cared for in their own homes [5]. It has also been estimated that acute gastrointestinal illnesses associated with childcare facilities cost over \$2.3 billion annually [6]. The American Academy of Pediatrics notes the close proximity of children in childcare facilities and their natural curiosity to touch a wide range of objects and surfaces only heightens their risk of infection [7]. Additionally,

transmission of enteric pathogens in childcare facilities occurs from person-to-person contact (hand hygiene) due to the close interaction necessary in the care of children, particularly in diapering, toileting, and food service [7,8].

In childcare facilities, researchers have previously investigated food safety knowledge, attitudes toward safe food handling practices, food handling practices, as well as microbial analysis of food contact surfaces and hand hygiene. Wohlgenant et al. [9] examined hygiene and sanitation practices of childcare employees during food preparation in the kitchen as well as during food service in the classrooms to identify pathogen dissemination points. Researchers found the most out of compliance practices were food handlers wearing effective hair restraints, food handlers wearing gloves, sanitizer test kit available for facilities that wash dishes by hand, and availability of a food thermometer. Additionally, microbial analysis showed childcare facilities without a written food preparation policy had significantly higher aerobic plate counts on all surfaces [10]. Kotch et al. [11] identified that proper equipment in hand washing and food preparation areas designed to reduce the spread of infection had a significant effect on reducing illness among the children. The need for childcare workers to follow correct procedures to protect children from any harm, including foodborne illness, remains extremely important [7].

Childcare hand hygiene

Childcare employees play a crucial role in children's health and safety [12] and must actively work to prevent foodborne outbreaks [13]. For example, Fraser et al. [14] used observations to identify frequency of surfaces touched by childcare providers. Staskel, et al. [15] observed childcare cooks demonstrating lack of proper hand washing, nearly 50% used improper techniques. Cosby et al. [16] surveyed bacteriological contamination on selected food contact and non-food contact areas in childcare centers. Li et al. [10] combined observational and microbiological analysis showing facilities without a written food preparation policy had significantly higher microbial contamination on all surfaces than facilities with a written food preparation policy. Kinnula, et al. [17] investigated the use and safety of alcohol-based hand gels (AHGs) among children in childcare centers; Zomer et al. [18] observed childcare employees' compliance to hand hygiene guidelines and identified environmental determinants of hand hygiene behavior.

Roberts et al. [19] showed through a hand hygiene intervention that proper hand washing in childcare facilities greatly reduced rates of respiratory and diarrheal illness. Hand washing by childcare employees has been identified as the single most important preventative measure to avoid infecting themselves and children with harmful pathogens [20,21].

Thus, the specific research objectives for this exploratory study were to:

1. Assess hand hygiene training opportunities given to childcare food handlers in childcare facilities.
2. Identify what food safety training childcare directors currently possess.

Material and Methods

Sample

The target population for this study was licensed center-based childcare directors in a South Eastern state. Licensed center-based childcare facilities including commercial, church, and preschools. 99 childcare directors were randomly selected from a database of all licensed center-based childcare facilities in the state.

Questionnaire

A paper-based questionnaire adapted from [22] was utilized, consisting of 9 questions to identify childcare facility demographics, and evaluate childcare facility food safety training. The childcare facility demographics section contained 3 questions including: type of childcare facility (i.e. independently owned or operated, chain/franchise); number of food handling employees; and current enrollment. The childcare facility food safety training section contained 6 questions pertaining to food safety policies (2 questions); and food safety training (4 questions).

Data collection & analysis

To reduce sampling error and increase participation rates a survey implementation plan was utilized [23]. In the initial mailing a packet containing:

- Director cover letter.
- Director questionnaire informed consent form.
- Director paper-based questionnaire; and
- Prepaid addressed return envelope. Follow-up contacts spaced approximately one week apart for three weeks, were used to recruit participants [23]. Replacement questionnaires were offered. A final telephone contact to childcare directors was made to those childcare facilities who had not responded.

Data were analyzed using SPSS (Version 23.0). Descriptive statistics including mean, standard deviation, frequency, and percentage were used to summarize the data.

Results and Discussion

A total of 68 of the 99 director questionnaires distributed were completed, for a response rate of 68.7%. The majority of facilities were reported as independently owned/operated (64.7%), with

over 60% having 15 employees or fewer, as well as nearly 85% of facilities had 200 or less children enrolled (see, Table 1).

Table 1: Childcare facility demographics (n=68).

Childcare Facility emographics (n=68)	n	%
Type of childcare operation		
Independently owned/operated	46	64.7
Chain/franchise	25	35.3
Number of food handling employees		
Fewer than 10	21	30.9
11-15	22	32.4
16-20	6	8.8
21-25	6	8.8
More than 25	13	19.1
Current child enrollment		
Less than 100	25	36.8
100-200	33	48.5
More than 200	10	14.7

All but two (97%) childcare directors stated they have food safety hand hygiene policies in place, yet 24 directors stated they do not have written hand hygiene policies (see, Table 2). Current study results are higher than previous childcare research, in which 83% of centers reported written procedures for hand washing [10]. The American Academy of Pediatrics’ (2011) recommends having written food handling policies, as they have been shown to increase compliance with proper food handling [7]. The distinction between having “hand hygiene policies” and having “written hand hygiene policies” is important, as the ability to communicate these policies with employees in the form of written procedures has been shown to improve hand hygiene practices [24,25]. Furthermore, previous research has identified the need for clear communication from the director on food safety practices [26]. Of the 68 respondents, 88.2% (n=60) stated they had previously received food safety training, with 70.6% (n=48) receiving a food safety certification as well. The importance of having a director (manager) with proper food safety education has been identified as critical to ensure employees following proper food safety practices [26]. In a study assessing food safety culture in childcare facilities, findings showed childcare employee’s ability to speak freely about food safety practices and communication from directors to employees had a positive effect on employees’ self-commitment to following proper food safety practices [27]. In other words, childcare employees need to feel comfortable speaking and asking questions to the director about food safety practice. However, just as important the director needs to have the food safety knowledge to answer the questions and communication appropriate food handling practices. Previous research in the restaurant setting exploring the influence of

food safety climate indicators on hand washing practices found managerial commitment significantly correlated with hand washing frequency [28]. However, finds also showed management rewarding of hand hygiene practices was not related to hand washing frequency. Similar findings were shown in a study on the perceptions of a video game to promote proper hand washing practices, in which respondents did not perceive the video game rewarding or helping to motivate them to increase their hand washing frequency or efficacy [28] (Table 2).

Table 2: Childcare facility food safety training (n=68).

Childcare facility food safety training (n=68)	n	%
Food safety hand hygiene policies		
Yes	66	97.1
No	2	2.9
Written food safety hand hygiene policies		
Yes	44	64.7
No	24	35.3
Director received food safety training		
Yes	60	88.2
No	8	11.8
Director received food safety certification		
Yes	48	70.6
No	20	29.4
Director provided food safety hand hygiene training		
Yes	47	69.1
No	21	30.9
Food safety hand hygiene training topicsa		
Hand washing	44	64.7
Glove use	31	45.6

^aMultiple selections possible.

In the current study, over 30% of childcare directors (n=21) reported not providing any training on food safety hand hygiene. Of the 47 directors who reported providing training, 44 (64.7%) indicated providing hand washing training and/or 31 (45.6%) indicated discussing proper glove use as a training topic. These findings are lower than previous childcare hygiene research, in which facility directors reported 94% of centers provided initial food safety training [10].

Due to the high-risk population (young children) in which these childcare employees serve, the need for hand hygiene training to ensure proper food safety handling practices is crucial. Yet current study results show that less than half of directors discuss proper glove use, which could potentially mitigate the spread of foodborne microorganisms. It should also be noted that initial hand hygiene training during new hire orientation is not enough to ensure continuous proper food handling practices. In their research in childcare facilities, Park et al. [29] found the need

for further education for the more tenured (10+ years) childcare cooks on proper food safety practices. On-going training and food safety interventions are recommended to ensure new employees are aware of and follow proper food handling practices, but also more tenured employees should receive refresher interventions on food handling practices.

Previous research investigating childcare employees' perceived barriers to following food safety practices identified respondents perceived they did not need to follow safe food handling practices [25]. This reinforces the importance of the childcare director's role in communicating not just the "how to handle food properly", but also the "why food should be handled properly". Furthermore, previous research has also suggested "evidence-based and customized education and support programs" should be created for educating childcare employees [29].

In a systematic review of foodservice industry food safety training topics & modalities findings showed the average length of training intervention was 6.5 hours [30]. However, "lack of time" and "too much work to do" have been identified as key barriers to following food handling practices and barriers to providing training [25,31]. Therefore, directors need to identify food safety training or interventions that are short as well as inexpensive.

A feasible approach to mitigate identified barriers to training in childcare could be to create multiple short single topic multi-modality training interventions (microlearning modules), which combined create a food safety education library. Each of the microlearning training interventions can be completed quickly and can be directly reinforced while on the job the same day. Dolasinski & Reynolds [32] developed a microlearning model applied in the hospitality industry. The authors identified several benefits to utilizing a microlearning approach including inexpensive, quick content delivery, and effective for on-the-job service training. For example, for childcare hand hygiene, a microlearning topic could be "how to wash your hands" (single topic) utilizing an educational poster, short video, and 2-minute director demonstration (multi-modality). This should then be reinforced by the director through observation. This single topic can then be combined with similar hand hygiene topics (when to wash hands, hand sanitizer usage, etc...) to create a larger hand hygiene educational library. This concept can be replicated for various food safety topics (hand hygiene, personal hygiene, temperature controls, etc...) in the childcare setting, as they are inexpensive, short, and provide immediate customized practical information [33].

Conclusion

Proper hand hygiene practices have been identified as the most important practice to mitigate the spread of foodborne

illnesses. Thus, the aim of this study was to explore hand hygiene training opportunities given to childcare food handlers in childcare facilities. Additionally, the manager of an operation (childcare director) has a major role in the food safety program at each facility. Therefore, this study also looked to explore what food safety training childcare directors currently possess. Key findings showed directors reported having hand hygiene policies, yet over one third lacked written hand hygiene policies. Additionally, most childcare directors received food safety training, however over 30% did not provide their food handling employees and hand hygiene training. Only slightly more than half the directors reported providing hand washing training, while even fewer provided glove use training.

The results show a clear need for increased childcare food handling employee hand hygiene training. Previous barriers of lack of time and funds have been identified. Yet, childcare directors can utilize microlearning to educate employees on hand hygiene using short, inexpensive, single content modules to mitigate these barriers. The microlearning training can be tailored to the facility's needs and can be deployed easily on-the-job. Hand hygiene training must be ongoing as well as director observations should occur to ensure continuous proper handling practices.

This study was not without limitations. First, this was a snapshot of childcare directors in one state, at one particular moment. It should be noted that each state creates their own food safety regulations for childcare inspections, thus generalization is cautioned. Additionally, only center-based directors were targeted as home-based facilities are generally smaller and only have one or two employees. However, the current study's exploratory results help to identify the lack of consistent training for the childcare director as well as the childcare food handler. Future research should assess the use of short customized food safety interventions (microlearning).

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