Food Safety
Attitudinal and Behavioral Practices of
Foodservice Personnel in
Texas Childcare Centers

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Introduction

• More than 250 known diseases are transmitted through food

• In 2004, the CDC reported
  – 1,319 disease outbreaks
  – up from 1,073 in 2003
  – majority caused by bacterial pathogens
Introduction

• No one is immune to foodborne illnesses
• Several high-risk groups:
  – children
  – the elderly
  – pregnant women
  – those with compromised immune systems
• Children <10 years of age experience 1/3 of all the foodborne illnesses in the US
Introduction

- A disproportionate number of enteric bacterial infections occur in children <5
- Children are particularly susceptible to the serious health consequences
- Children attending childcare centers at an even greater risk
Introduction

• Children attending childcare centers have higher rates of gastrointestinal infections than same-aged children cared for at home

• Improper food handling is one of the most common causes of foodborne diseases
Introduction

• Many childcare center employees are not adequately trained to keep food safe and prevent foodborne illnesses

• Effective food safety training and implementation of strict food safety standards are vital to preventing foodborne illness in childcare centers
Introduction

• The establishment and enforcement of food safety standards in childcare centers differs greatly

• The standards for one childcare center in Texas may differ from another center in close proximity
  – if they fall under different jurisdictions
Introduction

• Williamson County health department
  – requires each person handling food in a childcare center to have a Food Handler’s Card

• Travis County health department
  – requires that one person in each center has a Certified Food Manager’s (CFM) Card
  – that person does not have to be involved in food service
Objective

• Limited research is available regarding the food safety knowledge and behaviors of foodservice staff in childcare centers

• Study objective was to evaluate food safety attitudes, knowledge, and behaviors of foodservice workers in a sample of central Texas childcare centers
Pilot Study

- Childcare centers located in Travis and Williamson Counties that prepare and serve meals at the center

- 112 childcare center directors agreed to participate in the pilot study
  - Seventy-one centers returned the pilot questionnaire (63.4%)
Subject Sample

• 36 centers (59%) agreed to participate

• The childcare centers in this study:
  – capacity to care for 50 to 332 children
  – average capacity of 144 children per center
Questionnaires

• The Food Safety Demographic, Knowledge and Attitude Questionnaire (FSQ) and

• The Childcare Food Safety Assessment Form (FSA)

• Adapted from questionnaires developed by Giampaoli, et al.
The Food Safety Demographic, Knowledge and Attitude Questionnaire (FSQ)

- completed by the foodservice cook during the childcare center visit
  - included 3 demographic
  - seven attitudinal
  - 20 multiple-choice
FSQ Results - Demographic

• Of the 36 head foodservice personnel:

  – 9 (25%) had worked in foodservice for less than 3 years
  – 8 (22.2%) for 3-5 years
  – 9 (25%) had worked in foodservice for 6-15 years
  – 7 (19%) for more than 25 years
FSQ Results - Demographic

- 22 (61%) reported having some form of food safety certification
  - 14 (39%) did not
  - In centers where the cook did not have food safety certification, the childcare center director had the required safe food-handling certification
FSQ Results - Food Safety Knowledge Scores

• Scores ranged from 40%-90%
  – mean score = 70.97%
  – A passing score on the FSQ was set at 75% (15 out of 20 questions correct)
    • the passing score established by the Texas Department of State Health Services for the certified food managers’ exam

• 50% (18 of 36) passed the exam
• 50% (18 of 36) failed
FSQ Results – Attitudinal

• 100% of head foodservice personnel (n=36) strongly agreed or agreed with the statements:
  – “safe food handling is an important part of my job responsibilities”
  – “learning more about food safety is important to me”
  – “I believe how I handle food relates to food safety”
  – “I am responsible for making sure that the foods served to children are safe to eat”
FSQ Results – Attitudinal

• When asked if “my supervisor should have more responsibility for food safety than I do”:
  – 48% (n=17) disagreed or strongly disagreed
  – 36% (n=13) strongly agreed or agreed
  – 15% (n=6) remained neutral

• 39% of the head foodservice personnel do not have food safety certification, supervisors did, may contribute to this
Figure 1. Distribution of results from the attitudinal questions on the Food Safety Questionnaire in a sample of Texas childcare head cooks (n=36).
The Childcare Food Safety Assessment Form (FSA)

- completed by the researcher while observing the head cook in the kitchen
  - during preparation, serving, and clean up of the lunch meal at the childcare center

- One of the 36 centers was used for researcher training to improve inter-rater reliability
  - reducing subject sample to 35
FSA Results

• Behaviors that were not observed in all of the centers were excluded from scoring, such as:
  – “leftovers are reheated rapidly to 140°F in 2 hours”
  – “employees take appropriate action when coughing or sneezing”

• The remaining 26 questions were used to determine a score
FSA Results - Scores

• Scores ranged from 23% - 92%
  – mean score of 57% ± 2.6%

• 40% (21 of 35) did not hold hot foods at or above 140°F

• 71% (25 of 35) did not use thermometers to check food
  – All childcare centers are required by TDSHS to have a thermometer on site
FSA Results

• Cold foods where not held at or below 41°F by 54% (19 of 35)

• Only 20% (7 of 35) employees were observed wearing hair restraints
  – this is recommended but not mandated by TDSHS

• 57% (20 of 35) of cooks were observed washing their hands
Figure 2. The sanitary conditions and observed food safety behaviors of head cooks in Texas childcare centers (n=36)
FSA & FSQ Results

• No significant correlation was seen between the scores on the knowledge portion of the FSQ and the FSA

• Suggests food safety knowledge may not predict food safety behaviors
Conclusions

• Food handlers are not adequately following food safety procedures
• This may increase the risk for children at these centers to acquire foodborne illnesses
• All foodservice workers in childcare should be required to have food safety certification training
Conclusions

• Childcare directors and local health authorities must strictly enforce food safety behaviors which research has demonstrated to be the most influential in preventing food borne illnesses:
  - frequent, proper handwashing
  - adequate cooking
  - proper holding temperatures
1 Year Follow-Up Results

• V2 (visit 2) was conducted approximately 12 months from the date of V1 (visit 1)

• Approximately two months after the completion of V1, and about 6 months before the start of V2, a food safety training class was offered
1 Year Follow-Up Results

- *Serving It Safe* was used for the food safety education class
  - published by National Food Service Management Institute

- Participants had the opportunity to take
  - The Certified Food Managers exam
    - Travis County
    - Williamson County
  - The Food Handlers exam
1 Year Follow-Up Results

- The food safety training class was attended by 47% (n=15) of the centers

- Attendance did not significantly affect the change in questionnaire scores from V1 to V2
1 Year Follow-Up Results

• If the subject had attended the food safety training class:
  – scores decreased 47% (n=7) of the time
  – improved 33% (n=5) of the time
  – did not change in the remaining 3 cases

• If the subject did not attend:
  – the scores decreased 47% (n=8) of the time
  – increased 35% (n=6) of the time
  – did not change in the remaining 3 cases.
1 Year Follow-Up Results

• A significant increase ($P<.05$) occurred from V1 to V2 in the scores on the:
  – storage section
  – personal hygiene section

• Inadequate personal hygiene is associated with 10 million cases of foodborne illness per year
  – so an improvement in this area alone has the potential to reduce the risk of foodborne illnesses in these childcare centers
Figure 3. The sanitary conditions and observed food safety behaviors of head cooks in Texas child care centers at V1 and V2 (n=32)
Conclusions

• Education must be applicable to all types of food service establishments, since the needs of different establishment vary greatly

• The regulations that are established by the state and local health authorities must be strictly regulated and enforced
  – yet be flexible enough to protect the population served by different types of establishments
Conclusions

• Unlike restaurants, foodservice in childcare centers is only a part of the services offered
• Childcare center directors have many types of rules and regulations to follow apart from those imposed by the local health department
• Less time and resources are available for use on issues of food safety
• Many times only one food service person is employed per center and the turn-over rates are high
Conclusions

• Due to time and resource constraints, childcare staff may focus on completing tasks most often enforced by regulatory agencies

• Food safety regulations established should be ones most likely to reduce the incidence of foodborne illnesses while requiring the least investment of resources as possible