

2018

# Increasing Knowledge About Food Allergy Management in the Preschool Setting

Katherine Mizell Crow  
*Walden University*

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# Walden University

College of Health Sciences

This is to certify that the doctoral study by

Katherine Crow

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Walden University

2018

Abstract

Increasing Knowledge about Food Allergy Management in the Preschool Setting

by

Katherine Mizell Crow

MSN, Arkansas Tech University, 2015

BSN, University of Arkansas at Little Rock, 2012

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

May 2018

## Abstract

The prevalence of food allergies is a growing concern in the United States. Approximately 8% of the pediatric population has some form of food allergy. Many of these children are either in the preschool and primary school setting, which is where the majority of allergic reactions occur. If the symptoms of a food allergy reaction are not treated within minutes of exposure, the results can be damaging or fatal. Evidence continues to demonstrate that preschool and school personnel do not feel trained or prepared should a severe reaction arise. The purpose of this evidence-based project was to determine if the implementation and instruction of food allergy guidelines and an educational in-service program on the treatment of food allergies would increase the knowledge and ability of preschool personnel to respond should a reaction occur. The adult learning theory of Knowles and Bandura's theory of self-efficacy were the theoretical frameworks for this project. This project incorporated a 40-minute educational in-service along with the introduction of food allergy guidelines including an emergency action plan and epinephrine auto-injector training. A pretest and posttest were administered prior to and following the educational in-service, respectively. A paired sample *t* test revealed there was a dramatic increase in knowledge following the educational in-service about food allergy management, recognition, and treatment. Preschool personnel felt more empowered to react should a food allergy reaction occur. By teaching preschool-personnel about food allergies, they will have the necessary resources that will support the creation of a safer environment for children challenged with food allergies.

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## Dedication

I dedicate this project to my two precious children, Tucker and Blakely. Tucker, your bravery, confidence, and pure enjoyment of life surprise me every day. You bring so much happiness and laughter to my life. Through the journey of your diagnosis with food allergies, I have been able to develop a deeper knowledge about food allergies and create a plan so that no child is at risk should an allergic reaction occur. God knew exactly what He was doing when He made me your mommy. Thank you for being so patient with me during my times of stress and intense focus. I love you so much Tucker boy! Blakely, my precious little girl in Heaven. Because of you and your precious short life here on this earth, you have instilled in me a deeper level of strength, survival, and love than I could have ever imagined. Because of that, I have been able to accomplish one of my greatest achievements. Oh how I can't wait to hold you in my arms again one day. You will always be my little sweet pea, Blakely!

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Above all else, I give all the glory to my Heavenly father for being able to accomplish this project. He makes all things possible and without His guidance, strength, and love, I would have never been able to accomplish this achievement. He made doors open when they needed to be and kept them shut when necessary. I would like to thank my incredible husband, Trent. You have been my rock through this entire journey and I could not have done this without you. Your calm and encouraging manner kept me sane during my moments of stress and worry. Thank you for taking such good care of our son, our home, and all of my honey-do needs. I would like to thank my amazing parents for standing beside me during this journey. Mom, thank you for being my faithful warrior, biggest cheerleader, and the ultimate head and back scratcher during my moments of weakness. Dad, your intelligence, guidance, and strength through the creation of this project helped me to accomplish this dream. Thank you for sharing your wisdom about all things medical and patient related. Your knowledge is what helped me to get where I am today. As the saying goes, "it takes a village". Thank you for being my tribe and standing with me through this journey. I love you all so much!

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## Section 1: Nature of the Project

### **Introduction**

Safety is a central foundation in the health care setting. In our nation today, one of the most challenging diagnoses facing the pediatric population is food allergies. Around 6 million children in America have some level of a food allergy and the number continues to rise (Food Allergy Research and Education, 2014). This translates to approximately 1 in 13 children, or essentially two in a given classroom; 40% of these children having a history of severe reactions (Food Allergy Research and Education, 2014). A food allergy reaction occurs when an individual's immune system recognizes ingested food as toxic. Children can be allergic to numerous foods, mainly milk, eggs, strawberries, soy, wheat, shellfish, and peanuts (Fleischer et al., 2012). Some of these ingredients are in the majority of foods that are often served to small children. The smallest ingestion of an allergen could cause a severe reaction (Fleischer et al., 2012). Food allergies cost Americans approximately \$25 billion each year (Gupta et al., 2013). If a child has an allergic reaction and is not provided the proper treatment, a life-threatening reaction can occur within minutes (Rod, 2012). One of the major practice problems confronted by the nursing profession is how to manage all of these food allergies in the preschool setting (Foster et al., 2015).

Current research demonstrates that there is a need for food allergy education and training for preschool personnel (Foster et al., 2015; Chokshi et al., 2014). Studies have revealed that preschool personnel (teachers, assistants, directors) do feel not adequately prepared should an allergic reaction occur (Polloni, Lazzarotto, Toniolo, Ducolin, and Muraro 2013). Preschool and school educators and nurses have requested training on the symptoms of an allergic reaction,

how to manage the symptoms, and how to create of a plan of action and assigned roles for the preschool (Polloni et al., 2013). However, despite the need training and implementation of practice guidelines, little research on this being performed. According to Eldredge and Schellhase (2012), for children with food allergies, the preschool environment presents the most challenges, including lack of a school nurse on site, lack of training or information for teachers and directors on how to recognize or prevent allergic reactions, lack of access to an epinephrine auto-injector and lack of knowledge about the proper use of an epinephrine auto-injector (Eldredge & Schellhase, 2012). On average, 1 in 5 students, per school year, in the preschool and school setting, will have a reaction to a food previously undiagnosed as an allergen while in the care of school personnel (Liu et al., 2010). The majority of serious reactions and fatalities that occur are due to delayed treatments (Boyce et al., 2010). Food allergies are on the rise (Food Allergy Research and Education, 2014). Recognition of symptoms and managing them is crucial.

### **Problem Statement**

Given the number of children who have been diagnosed with food allergies (Food Allergy Research and Education, 2014), and the potential severity of a food allergic reaction (Rod, 2012), extensive research is being done on preventing the accidental ingestion of the harmful substances and how to manage children when they do ingest them (Food Allergy Research and education, 2014) Given the number of hours young children spend in the preschool setting compared to home, there is an increased risk of an allergic reaction while in the preschool setting. Most families can make their homes free of the allergy containing product, but this is not as feasible outside of the home setting and in the preschool setting. This is the primary area of concern. The focus of this research is properly preparing and training preschool personnel to

prevent, recognize, and manage food allergies in the preschool setting to prevent a serious or fatal reaction

### **Purpose Statement and Project Objectives**

The purpose of this Doctorate of Nursing Practice (DNP) project was to respond to a needs assessment in the pediatric food allergy population and preschool setting. Once I understood the needs and concerns of preschool personnel, I created and implemented an educational in-service program and introduced evidence-based policy guidelines on how to manage food allergies and manage the protocols to follow should an allergic reaction occur. My plan included examination of best practices for food allergy management in the preschool setting and the development a food allergy education program for the preschool personnel which included anaphylaxis treatment and an epinephrine auto-injector demonstration. I reviewed the current national safety standards for managing food allergy guidelines for the pediatric population. In creating and implementing this plan, the goal was to protect children from food allergy reactions while in the preschool setting. Teachers, assistants, and the directors were all trained. The in-service program and guidelines will increase the ability of school personnel to be able to recognize and manage an allergic reaction occur. As a DNP in the community, my role was to develop knowledge through the investigation and understanding of evidenced-based practice. This type of doctoral project aligns with the creation of evidenced-based practice guidelines in order to improve outcomes for children in the food allergy community.

### **Significance of the Project**

The prevalence of food allergies in the United States represents a significant practice problem (Food Allergy Research and Education, 2014). While there is extensive research on the

topic of food allergies as a diagnosis, there is little research on how to properly manage these children away from their parents and outside the safety of their home. This problem also poses as a significant threat in the infant and toddler population, because this is the primary time in which the food allergies arise without warning (Eldredge & Schellhase, 2012). Current research states that the primary method for managing food allergies is to avoid the substance and to verify that hands and table surfaces are properly cleaned. In the younger pediatrics population, this is very difficult to do and preschool personnel require an increased knowledge-base regarding to education on how to prevent, manage, and treat reactions.

Preschoolers are quick in their actions and tend to be messier than older children. They also tend to put their hands and objects to their mouths and eat off plates other than their own. The purpose of this project was to (a) help increase the preschool personnel's awareness of food allergies and (b) the proper guidelines to have integrated into the system and followed to prevent serious adverse events. It is anticipated that the data and evidence collected from this project will be helpful to preschool systems across the nation.

### **Project Question**

Does the implementation of food allergy evidenced-based practice guidelines and educational in-service programs help to increase the knowledge of school personnel to better manage food allergies and reactions in the preschool setting? As food allergy diagnoses continue to increase, it is essential for preschool personnel to know to manage food allergies and react should a reaction occur. Given the increased challenges of the younger pediatric population, a time when new allergies arise, preschool personnel increasingly need this training. With the implementation of the most advanced food allergy guidelines and education training, preschool

personnel will be able to prevent food allergy reactions from occurring and have the ability to respond in a quick and methodical manner should a reaction occur. This will ensure that the personnel are current on the guidelines for managing food allergy reactions in the preschool setting.

### **Evidenced-Based Significance of the Project**

The primary purpose of introducing evidenced-based guidelines into the preschool setting is to create a safer environment for young children who have a food allergy as well as for those have not yet been diagnosed. These guidelines and educational program will enhance the knowledge of preschool personnel and prepare them on proper management. Implementing food allergy management guidelines and educational in-services has been shown improve the knowledge and reaction ability of the preschool personnel (Foster et al., 2015). With a large portion of both parents in the home setting working full-time nowadays, there is an expectation for preschool personnel to meet all needs of the younger child for the majority of waking hours. A moderate percentage of their day typically involves the preparing, feeding, and clearing of meals and snacks with the child. As a teacher, it is difficult to prevent all accidental exposures to allergens. It is even more challenging when the child has not had a formal food allergy diagnosis. Approximately 25% of anaphylactic reactions will occur in the preschool and school setting where there was no previous food allergy diagnosis for that child (Food Allergy and Anaphylaxis Connection Team, n.d.). Of those children, 20% will experience a rebound reaction within 3 hours of exposure. When an exposure occurs, preschool personnel need to understand how to properly assess and react to the situation. Knowles' adult learning theory Bandura's theory of self-efficacy helped guide the assessment, building, and introduction of the food allergy management program.

### **Implications for Social Change in Practice**

The foundation of social change is based upon identifying where problems exist and developing solutions for improvements. As a primary pediatric nurse and a pediatric nursing instructor, improving quality of life for children with food allergies and verifying children are taken care of properly and safely is essential to my profession. As a nurse with doctorate training, I have the ability to impact policies created for the pediatric population (American Association of Colleges of Nursing, 2006). The food allergy guidelines and educational in-service program will be designed to introduce an increased level of safety and quality improvement into the preschool setting. This program will help to increase the knowledge and ability of preschool personnel to learn prevention techniques of potential allergen ingestion and the proper care management should a reaction transpire.

The most essential method for reducing the number of allergy reactions and anaphylactic episodes that occur each year in the preschool setting is through increased education and implementation of management guidelines. Teachers have stated that they feel inadequately educated about food allergies and how to react should an emergency situation occur (Ravarotto et al., 2014). This issue has reinforced the need for food allergy training and management programs to be initiated in the preschool setting. This quality improvement change could have a major impact on the number of adverse events that occur yearly due to food allergy reactions. In my pediatric professional role, I have the opportunity to be a social change agent and make a true difference in the lives of children. The primary outcome of this project will be to increase the knowledge level of preschool personnel in congruence with reducing the occurrence of food allergy reactions, reducing cost of food allergy treatment economically, and improving the quality and safety outcomes of pediatric lives.

## Definitions of Terms

The following terms were used for the defining and completing of this staff education project.

*Preschool setting:* A preschool setting is defined as an educational and developmental environment for children six years of age and younger (Foster, Campbell, Lee, & Anderson, 2015). This type of setting can include a private preschool, a preschool established in a primary school, or a daycare with preschool aged children.

*Anaphylaxis:* Anaphylaxis is defined as a rapid allergic or abnormal immune response, which could result in a possible fatal reaction (Foster, Campbell, Lee, & Anderson, 2015). Allergic reactions are avoidable if the proper precautions and training are introduced. Anaphylaxis symptoms include wheezing, shortness of breath, pale skin, hoarse throat, swelling of the lips of mouth, hives, and reoccurring of diarrhea or vomiting (Food Allergy Research and Education, 2017).

*Epinephrine:* Epinephrine, also defined as adrenaline, is the standard treatment for a severe allergic reaction (Food Allergy Research & Education, 2017). The common self-injectable forms include Auvi-Q, EpiPen Jr., and Impax Auto-Injector. Proper training is essential for correct use of an epinephrine injector.

*Guideline:* A guideline is a defined standard which designates appropriate interventions which must be taken in order to effectively manage a patient problem (Connecticut Board of Examiners for Nursing, 2004). Following implemented guidelines will provide preschool personnel with a plan for treating and preventing adverse reactions.

*In-service*: An in-service is a training or course program that individuals participate in, in order to increase their knowledge or professional skills that are required to perform particular duties (Ibrahim, 2015).

### **Assumptions**

This project was guided by three assumptions. Assumptions are not always considered actual evidence, but in using them, they helped with creating better outcomes for the patient community (Hoffmann, Bennett, & Del Mar, 2010, pg. 302).

- 1) The preschool personnel understand the severity of food allergies and the need for practice guidelines.
- 2) The education and recommendations provided to the preschool personnel will be fully implemented within their setting following the project.
- 3) The challenges faced in this preschool setting, in regards to food allergy management, are the same challenges that are being met across the country.

### **Scope**

This project was developed based on the need to change food allergy practices within the preschool setting. The population for this study included preschool children, 5 years of age and younger, preschool personnel including the teachers, the assistants and the two directors. The location was limited to this single preschool

### **Limitations**

The limitations of a study are features of the research design that could influence the outcomes of the research. Understanding limitations will help the researcher to appropriately design the project in order increase the validity of the evidence (Price & Murnan, 2013).

- 1) That the data collected for this project was from one preschool setting and may lead to limited generalizability. Each preschool setting has their own culture and methods for providing safe environments and designated guidelines for one setting may not be applicable to another.
- 2) Teachers have limited knowledge about food allergy management and therefore it is important to design an educational program to address this lack of knowledge (Foster et al., 2015)

### **Summary**

The purpose of Section 1 was to introduce and discuss the problem of food allergy management and treatment in the preschool setting. Introducing the essential evidenced-based practice guidelines and training preschool personnel on avoidance, symptom recognition, treatment, and the proper use of an epinephrine auto-injector will help protect young children who are at risk for developing a food allergen reaction. Delaying treatment by a couple of minutes can have a critical impact on the outcome of a reaction. This project is expected to help narrow the knowledge gap identified through research and to provide protocols for preschool personnel to follow should an adverse reaction occur.

In Section 2, I cover the literature review which reveals the available evidence to validate the significance and necessity of this project. This section includes the literature search strategy, the application of theoretical frameworks and conceptual frameworks that helped in designing the project. Following section 2, the methodology and findings and will be discussed.

## Section 2: Review of Scholarly Literature

### **Introduction**

Food allergies are a growing problem in the United States and adults in the preschool setting, who are in close contact with young children for multiple hours per day, need to be trained to recognize, manage, and treat food allergies and reactions. The purpose of this literature review is twofold: to develop a deeper knowledge about the management of food allergies in the preschool setting and to provide evidence that preschool personnel feel inadequately prepared to recognize, manage and treat food allergies. Severe, adverse effects can be avoided if the food allergy guidelines are implemented and if an in-service program, which includes the proper use of an epinephrine auto-injector, is presented. In Section 2, I investigated the review of literature to develop a better understanding about the concerns that preschool and school personnel have about food allergies and essential food allergy management guidelines to include during the development of this project.

### **Literature Search Strategy**

A comprehensive literature search was performed in order to gather scholarly evidence related on food allergy safety in the preschool setting. The following databases were used: (a) Medline with Full Text, (b) Cumulative Index to Nursing and Allied Health Literature (CINAHL), (c) ProQuest, (d) Google Scholar, (e) PubMed, and (f) BioMed Central. Search was limited to 2007-2016. The following keywords were used: *food allergies, childcare setting, preschool setting, school setting, education, anaphylaxis, epinephrine, teacher, management, prevention strategies, safety guidelines, adult learning theory, self-efficacy, and ACE star model*. A total of 83 studies identified. I thoroughly reviewed each study and determined the level of

significance for the literature review. The studies selected for the literature review had to be peer-reviewed and published in the last 10 years. The articles that were excluded included anything greater than 10 years, written in a language other than English, and articles not specific for the preschool or school setting. Many of the studies included childcare, preschool, and primary school settings (many primary schools have a preschool department). In this way, 10 articles were selected for review.

### **Allergic Reactions to Foods in Preschool-Aged Children**

Understanding the frequency of food allergy reactions in the preschool setting and how the different age groups present symptomatically with reactions is essential to understand when creating an in-service program. Fleischer et al., (2012) conducted a quantitative study to investigate the frequency of, and situations surrounding allergic reactions to foods in preschool-aged children. This study included five different preschool locations, with 512 infants between the ages of 3-15 months. Inclusion criteria included young children who had been diagnosed with a milk or egg allergy or those who had the potential to develop an allergy. The reactions were documented on a 36-item questionnaire detailing the events and symptoms along with the type of treatment provided. A reaction was included in the study if immune symptoms transpired within 2 hours of exposure and was rated on a scale of 1 being mild and 3 being severe. The study lasted 36 months. During that time 834 total reactions occurred. There was an average reaction rate of 81% per year or 367/512. Out of the 367 reaction, 269 children were reported to have more than one reaction. The primary causes for reaction included ingestion of milk, egg, and peanut, with milk being the primary trigger. More the half the time the reactions occurred, the child was being provided a meal or snack by someone other than the parent. A total of 52 reactions were treated with epinephrine, with 40 of those reactions being documented as severe.

It was acknowledged that 65 of the reactions that should have been treated with epinephrine but were not due to not have the training to identify the symptoms, unavailability of epinephrine, fear, and uncertainty about whether the reaction is severe enough for epinephrine. The findings from this study revealed that there is an increased rate of allergic reactions triggered by accidental and non-accidental ingestion and that epinephrine was not being administered when deemed necessary. The primary limitations for this study included the potential for not all reactions being documented, inaccurate details of reaction events, and withholding of details when ingestion was purposeful. This study exposed the increased need for preschool personnel education including management, label reading, avoidance of allergens, and treatment protocol for reactions.

Rudders, Banerji, Clark, and Camargo (2011), conducted a study to determine how children of different age groups clinically present during an anaphylaxis episode caused by an allergy to a particular food. They studied 605 children who presented to Massachusetts General Hospital and Children's Hospital with food-induced allergic reactions, between January 2001 and December 2006. These visits ranged from mild skin reactions to anaphylaxis shock. The primary group of children that presented with anaphylaxis was male, less than two years of age, and no previously known food allergies. The main sources were peanuts and milk for infants and tree nuts for adolescents. Through this study, the researchers discovered that when there is prompt recognition of an allergic reaction, the consequences can be far less significant. The researchers suggest that there needs to be better education on how to identify and manage an allergic reaction.

### **Ability of Preschool Personnel to React and Respond to Reactions**

Foster et al., (2015) conducted a quantitative study to measure the level of preparedness in the preschool setting should an anaphylaxis reaction arise. Many preschools do not have a school nurse onsite and which requires preschool and school personnel to react when necessary. The participants of this study included children who were under six years of age in the community and enrolled in some level of a preschool setting. This study had 24 preschools participating. The staff included teachers, directors, assistants, and aides. Anonymous questionnaires were administered to the 181 school personnel who participated in the study. These questionnaires were administered before and after a 40 minute educational training session on proper recognition and treatment of an anaphylaxis episode. The questionnaires included features about the staff, experience with food allergies, in past training they have had, and their comfort level with food allergies and management. Through the performance of this study it was discovered that only half of the participants had taught greater than five years, and only 43% had previous anaphylaxis recognition and treatment training. The majority of the participants requested to have more training regarding anaphylaxis. The primary barriers for treatment were identified as under-education regarding anaphylaxis recognition, treatment, and correct use of an epinephrine auto-injector. Following the educational training, the levels of comfort in recognition and use of an auto-injector profoundly increased. Limitations of this study include inadequate questionnaire completion, demographics of preschool participants not studied, and not defining the medical terms utilized in the questionnaire. This study reinforces the need to preschool personnel to be trained on how to prepare, manage, and recognize anaphylaxis. It also demonstrates a voiced need by the preschool personnel for further training.

Polloni et al. (2016) conducted a study to determine the level of self-efficacy school personnel have in managing food allergies and anaphylaxis reactions. Self-efficacy is the belief one has in their self to react during a defined situation. This study included a sample of 440 school teachers and caretakers. Participation in this study was voluntary. The participants were administered questionnaires assessing the level of self-efficacy they had regarding food allergies before the administration of the food allergy management training session. The questionnaires were kept anonymous and the participants were explained the purpose of the study. The results of the self-efficacy scale demonstrated that school personnel do not have the confidence in recognizing anaphylaxis symptoms or administering an epinephrine auto-injector. While they had strong levels of experience with managing food allergies and creating a safe environment for the children, they did not feel as confident in treating the reactions. Limitations of the study include not being able to generalize the findings of this study, responses may be different from those participants who would not be considered voluntary, and further studying of the self-efficacy scale needs to be performed in order to ensure validity. The study identified that there are decreased levels of confidence when providing care to children who are having a severe allergic reaction. It was concluded that implementation of food allergy protocols, training on accurate recognition, and timely treatment is crucial.

Ravarotto et al. (2014) conducted a study to investigate the level of knowledge teachers have in regards to food allergies and the impact a teacher-oriented training session can have. This study included a sample of 158 teachers between the ages of 36 to 55 years. Two questionnaires were administered, one before the seminar and one after the seminar. The questionnaires were used to investigate the level of knowledge teacher's had about food allergies and treatment. Of the 158 teachers participating, 72% stated that they had a child in their classroom with a food

allergy, 23% of those had five or more food allergies. Prior to the seminar, the teachers rated the significance of food allergies to be a problem as a 7.6 on a Likert scale from one to ten. The level of knowledge was rated as a 5.1 on the Likert scale. Following the seminar 94.2% of the participants found the presentations to be very helpful. The effectiveness of the seminar had a mean score of 8.6 on the Likert scale. Limitations include sample size and inability to generalize the results of this study for all school teachers. This study was able to demonstrate the decreased levels of knowledge that teachers have about managing and treating food allergies and reactions and that very few teachers have had proper training about food allergies.

Kim and Kim (2016) conducted a study to investigate the preparedness level of parents and childcare centers are for managing food allergies. This study included 158 parents, 137 childcare centers, and 171 school personnel. Through data analysis it was discovered that 38.6% of preschoolers had been diagnosed with food allergies, 21% of the childcare centers were unaware of any restrictions for the food allergy child, and only 14% offered other foods in place of the allergen. It was also discovered that only 28% of the childcare personnel had received any form of training about food allergies when most of them requested for some sort of training to occur. This study confirms the need to improved food allergy management and the proper training for recognition and treatment. Childcare settings also need education on possible replacements for food choices when a child is diagnosed with a food allergy.

Carlisle et al. (2014) conducted a study to investigate and determine how nurses feel about food allergies and what educational needs are being requested. This study included 199 school nurses. They were administered anonymous surveys determine what educational needs need to be addressed. The primary topics of weakness were the creation of an emergency plan, who would take on what roles during and emergency, and the education level of the personnel in

regards to food allergies. One of their primary requests was for education materials about food allergies and appropriate management. This study is able to validate the need, not only for preschool and school personnel, but for school nurses as well. Food allergies are becoming a much larger issue in all types of school-based settings and all personnel need to be educated on preparing for, managing, and recognizing food allergies and reactions.

Chokshi, Dillard, Guffey, Minard, and Davis (2014) conducted a study to determine the basic knowledge that school personnel have in regards to food allergies and how effective an educational training session would be. Utilizing the 'Chicago Food Allergy Research survey for the General Public', the study was based on a questionnaire that was distributed to a group of school personnel one hour before and one hour after a food allergy educational conference. The study had a sample size of 50 respondents. It was revealed that at least 80% of those surveyed knew at one or more persons with a food allergy and 65% had previous experience with children in the school setting who had a food allergy. Those individuals with a higher educational standing had a greater knowledge base than those who did not. The research study was able to prove that when a food allergy educational session is implemented, there is a dramatic increase in the knowledge base. The knowledge level went from 44% pre-test to over 80% post-test (Chokshi et al, 2014). The primary areas where the knowledge level increased included allergy triggers, prevention and management of an allergic reaction, history of allergies, and attentiveness to bullying in relation to food allergies.

Pulcini, Marshall, and Naveed (2011) conducted a study to determine the existence of emergency action plans (EAP) implemented for managing allergic reactions in children in the school setting and how the nurses perceived them. A survey was administered to school nurses between the years of 2008 to 2009. Of the 659 offered, 194 responded to the survey. In 2008, it

was found that 30% of schools reported having an EAP in place, while 29% reported only up to 10%. The results were comparable for 2009. It was discovered in both 2008 and 2009 that the students who had a higher probability of having an EAP in place at the school were those where the parents or physician had sent information to the nurse. This study was able to show the inconsistency of EAPs in the school systems and that preschools and schools need to be educated and more consistent with the use of these plans.

### **Key Themes for Effective Management of Anaphylaxis in the Preschool Setting**

Numerous research studies have presented the need for emergency care plans and school personnel education regarding how to prevent, recognize, and manage food allergic reactions. Eastwood and Cutter-Mackenzie (2010), indicated that there are four primary aspects to preventing and managing anaphylaxis appropriately. The main concepts include teacher education, preventive measure implementation, emergency care plans for students who have been diagnosed with a food allergy, and well-defined policy guidelines. Early childhood educators and school personnel need to be educated on how to properly assess the signs of anaphylaxis and how to prevent tragedies. Research has continued to show that teachers are uninformed about anaphylaxis and how to manage reactions (Sheetz et al., 2004). It is crucial for preschools to understand the importance of cleaning surfaces correctly and the process of scanning food labels for hidden allergens. Many of the food products given to the children are not analyzed for hidden allergens. Should an allergic reaction occur, personnel need to be accurately informed about the policies that have been set in place by the school and how performs what roles (Eastwood & Cutter-Mackenzie, 2010). Lastly, it is essential for preschool personnel to understand the purpose of actions plans and how they can be utilized should a child begin to show signs of an allergic reaction.

## Theoretical Framework

The first theoretical framework for designing this project was Knowles' adult learning theory. The purpose of this theory is to assist with identifying features of adult learners. These features are identified through assumptions and principles that Knowles' has developed. Knowles believed that in order to engage adult learners, one must understand the basic assumptions about adult learners. Adult learners (andragogy) differ than a child learner (pedagogy) due to level of maturity, life experiences, and previous educational experiences (Knowles, 1973). Originally, there were four basic assumptions created by Knowles in 1973. The first assumption is *self-concept*. As an individual matures they will begin to develop a self-directed individual instead of being as dependent as they once were. The second assumption is *experiences of the adult learner*. This is based on the belief that as an adult is faced with challenges and life experiences they will develop an increased knowledge base. Through this increased knowledge, individuals will begin to develop their own interests and ideas of what they want to achieve during this lifetime. The third assumption is *readiness to learn*. During the maturing stages of adulthood, individuals will begin to see where there is room to grow and develop. They will begin to develop a level of interest in learning methods for improving their role. The fourth assumption is *orientation to learning*. The assumption is formulated from the belief that adults are problem-centered learners verses the child manner of subject-centered learning. The adult will begin to understand the need for learning topics that will improve their current role and skills. In 1984, Knowles added a fifth and sixth element to the assumptions of adult learners. The fifth assumption is based on the *motivation to learn*. Knowles believed that as an individual matured, they develop a greater interest in learning and enhancing their knowledge base. The sixth assumption developed by Knowles is *need to know*. It is believed that in order for

adults to take on new task, roles, and learn new information, they must have an understanding and reason for it (Knowles, Holton, & Swanson, 2012).

The second theoretical framework for the development of this project was Bandura's theory of self-efficacy. This theory was originally derived from Albert Bandura's social learning theory. It is the perceived belief in one's ability to succeed should a situation or challenge arise (McEwen & Wills, 2014). This theory assists individuals to set standards for their own behavior and apply the skills which are necessary in order to achieve certain goals. This theory is important because when individuals have fear or don't feel prepared they avoid setting goals or responding to situations. On the other hand, when individuals feel confident about a particular challenge, they will be more willing to become involved and assist with problems (Bandura, 1986). The core of this theory is that an individual must feel that they have the ability to be successful and make a difference before they choose to become engaged in a situation or a goal (McEwen & Wills, 2014).

According to Bandura (1986) individuals utilize four sources that predict the properties of self-efficacy. The four sources are enactive attainment, secondary experiences, verbal influences, and physiological response (Bandura, 1986). In enactive attainment, the individual's knowledge level greatly influences their conduct and ability to successfully respond when a specific problem arises. Secondary experiences are achieved when individuals feel an increased ability to perform a task after witnessing a positive outcome of others performing that same task. Verbal influences, such as educational training, can have an influence on the individual's sense of encouragement to make necessary changes. Physiological responses are the achievement of an individual's own belief that they are able to make a change in their behavior and be successful in responding to

future situations (Bandura, 1986). With a higher level of self-efficacy, an individual feels empowered to set goals and successfully engage in problem-solving situations (Bandura, 1986).

The theory of self-efficacy is also appropriate for addressing the practice problem of food allergy management in the preschool setting. One portion of the food allergy management guidelines will be that all preschool personnel are required to attend the food allergy educational in-service program. According to Bandura (1986), education can be attained through the observing and listening of others. These influences obtained through an education session can lead to empowerment in an individual and increase their level of self-efficacy. A nurse's role is to encourage confidence instead of accepting the already adapted behaviors (Bandura, 1986).

The self-efficacy theory is a valid tool in determining how to provide effective training. Chokshi, Dillard, Guffey, Minard, and Davis (2014) validated that when a customized food allergy educational training session is provided for school personnel, the knowledge level can dramatically increase. An increase in comprehension leads to a higher level of perceived self-efficacy (Bandura, 1986). Carlisle et al (2010), demonstrated the primary areas for lower self-efficacy were related to the development of an emergency plan of action, staff education, and role performance during an emergency. In order to create food allergy guidelines for school personnel, an investigation must occur to determine the barriers and fears which may affect the level of self-efficacy school personnel have in managing food allergies and reactions. This type of basic foundation will allow for the creation of an education program that is specific to the needs of the particular personnel being trained.

## Conceptual Model

The conceptual model used for the development of this project was Stevens' ACE (Academic Center for Evidenced-Based Model) star model of knowledge transformation. This model is useful in creating and implementing projects within the clinical setting. There are five levels of knowledge acquired in this model. Each point of the star represents one aspect of the model (Stevens, 2012; See Figure 1 below). The points include research discovery, a summary of evidence, translation into guidelines, practice integration, and process evaluation (Stevens, 2012). Using this type of model allows the researcher to gain knowledge about a particular problem and determine effective methods for resolving the issue. The purpose of the ACE Star Model is to combine research with practice in order to improve the quality of care provided to patients and the outcomes that they experience (Stevens, 2012). By following the sequence of points of the star diagram I will be able to transfer highest level of researched knowledge into evidence for improved patient practice and safety guidelines. The main limitation to this model is that it is primarily researched based and doesn't allow other forms or methods of evidence (White, 2012).

Transforming knowledge into evidence requires the nurse to understand the eight fundamental principles. Utilizing the principles enhances the significance of the revolution of knowledge (McEwen & Wills, pg. 265, 2014). The eight premises are presented below (Stevens, 2012).

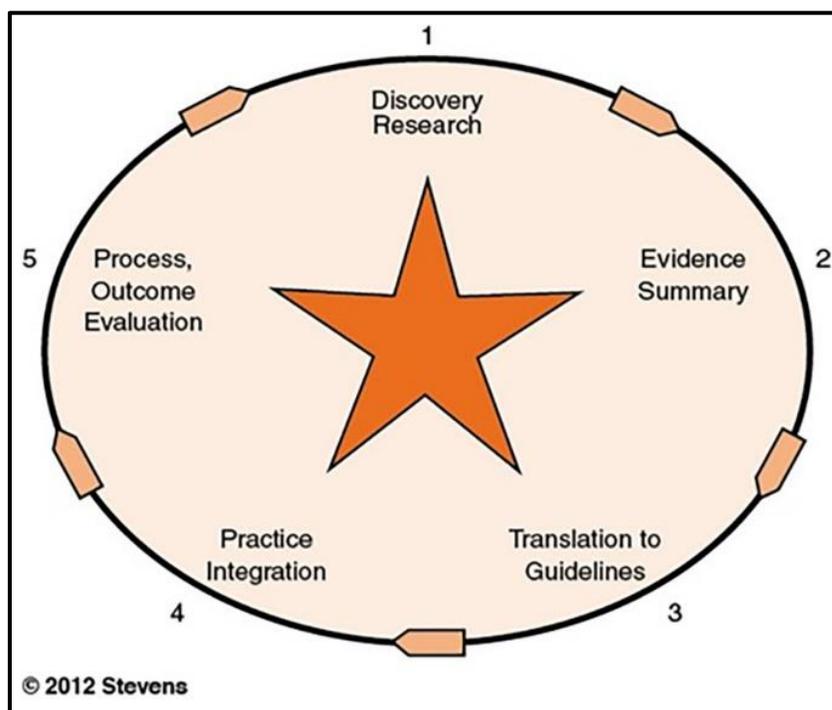
- 1) Knowledge transformation needs to occur before applying the evidence to decisions being in the clinical area.

- 2) There are multiple methods for developing and applying new knowledge. Some of these methods include past clinical experience, research performance, application of theoretical principles, and testing different approaches for addressing the challenge until a final solution is achieved.
- 3) Research is the ultimate source of knowledge. Methodical processes which will eliminate bias are essential to validating the transformation of knowledge.
- 4) Evidence will be classified based upon the rigor and accuracy of the research and how the evidence was developed.
- 5) As more evidence is researched and developed, deeper foundations of knowledge will be created.
- 6) The manner in which the knowledge is created and formed will determine its area for usability.
- 7) Evidence-based practice research is the ultimate level of knowledge for clinical decision making.
- 8) Transformation of knowledge occurs through summarization of science, application of researched science into clinical recommendations, integration of particular actions, and evaluation of the recommended outcomes.

Through utilization of this ACE Star Model, I was able to understand the different features of knowledge transformation and the methods for best application of the new evidenced-based concepts and practices into the preschool setting.

## Summary

In this section the literature review, theoretical frameworks and conceptual frameworks for this project were discussed. The articles that were used for this project demonstrated evidenced-based content which could be utilized for the development and implementation of a food allergy in-service program for preschool personnel and how to appropriately manage food allergies and reactions. In Section 3, I cover the methodology for this evidenced-based project, outline the project design and approach, analyze the data results, and describe the evaluation plan for this project.



*Figure 1.* From the University of Texas Health Science Center. By K.R. Stevens. (2004). *ACE Star Model of EBP: Knowledge Transformation.* Academic Center for Evidence-based Practice. Available at <http://www.aahs.org/aamcnursing/wp-content/uploads/The-ACE-Star-Model.pdf>

## Section 3: Methodology

### **Introduction**

The purpose of this DNP project was to develop an evidenced-based food allergy plan including an educational in-service program for preschool personnel, food allergy and emergency action plan curriculum, and a pretest/posttest knowledge scale. The educational training session included food allergen avoidance recommendations, policy guidelines on how to manage food allergy reactions, protocols to follow should an allergic reaction occur, and the proper use of an epinephrine auto-injector. Research studies introduced in the literature review supported the need for this type of project to transpire. The purpose of section three is to present the approach, target population, and evaluation method that was for creating this project. Through the development and evaluation of this project, the preschool will be able to determine if they will fully integrate these recommendations into their setting.

### **Project Approach**

Following a systematic review of the current literature, a best practices approach was developed for this project. The first step was to perform an internal food allergy review. This included analyzing how many kids in the preschool have food allergies, what types of allergies, the presence of a food allergy plan, and whether an epinephrine auto-injector was on-site for that child. The next step was to analyze the current food allergy policies in place. This included how food allergies are managed, the current guidelines, who is assigned what role during a reaction, and how reactions are treated. Based on the information that was gathered about the current policies, I then compared those policies to the current, best, evidenced-based practice policies. Currently the preschool does not require an emergency action plan to be in place for each child

with a food allergy and the preschool personnel have never been educated on how to properly use the documents and apply the assessment tools. Furthermore, because of the setting in which this project took place, the personnel also needed to know how to react should a new allergy develop without a plan being in place. According to FARE, emergency care plans present the recommended treatments for an allergic reaction based on the presenting symptoms (2017). This plan is to be kept in a visible area where all school personnel can find it, should a reaction occur. The form created by FARE is easy to read. It includes a picture of the child and the severity of the allergy. It provides direct assessment tools and the steps to be taken should a child begin to show signs of a reaction. This policy requires that the child have an epinephrine auto-injector on the preschool property.

In addition to the emergency care plan, there was also a 30-minute educational in-service program for all preschool personnel. This included the teachers and two directors. I presented an educational training session (see Appendix C), which included current signs and symptoms of an anaphylaxis reaction, the roles of the preschool personnel, the recommendations by the CDC for reducing the risk of exposure to food allergens (see Appendix B), the current FARE emergency action plan and how to utilize it correctly (see Appendix D), how to treat an allergic reaction, and step-by-step directions for an epinephrine auto-injector (see Appendix E). I also demonstrated how to use an EpiPen auto-injector and allowed for hands-on practice with a training device. The preschool personnel were also given copies of the presentation and individual copies of the EAP to review.

Following approval of this project through Walden University's Institutional Review Board (Approval No. 09-12-17-0686393), my plan was to perform this project in the fall of 2017. This allowed the preschool personnel to have an in-depth educational in-service about food

allergies before the school year began. This will allowed the preschool administration time to determine how they would like to utilize these recommendations in their setting.

### **Target Population**

The setting for this project was a local preschool with children ranging between the ages of 6 weeks and 8 years old. There are 22 teachers, two directors, and approximately 131 children in this preschool. I discussed this project with the directors of the preschool and they felt that it would be very beneficial to the preschool personnel. They have never had any type of formal training regarding food allergies. I obtained formal permission and documentation for this project through the directors of the preschool. I did not collect any direct demographic data from parents/families during this project. All reviewing and data collection was performed through internal document review with the director's approval.

### **Protection of Human Subjects**

Approval for this project was obtained using Appendix A, Site Approval Documentation for Staff Education Doctoral Project, from Walden University. Individual participants in the study were provided Form B, Consent Form for Anonymous Questionnaires, from Walden University. This form was given to the staff member prior to collecting questionnaire responses. Obtaining a consent signature was not appropriate for this type of questionnaire. There were no physical or emotional risks with this project. There was no participant identification for this project. Participant information and their answers to pretest/posttest and evaluation remained confidential.

## Data Collection and Analysis

The data collection for this project included descriptive statistics about presence of food allergies in the preschool (age, type of food allergy, previous allergic reactions, and required treatment). This also included the overall occurrence of food allergies and reactions in the entirety of the preschool in the last year. This information was protected and kept confidential. Data collection also included a pretest/posttest of participants' knowledge level in relation to food allergies and proper treatment (see Appendix F). This was administered to the participants before and after the educational training session. The pretest/posttest included the FARE's 20-item questionnaire with three possible answers for each question. Permission by FARE was granted for usage of this test. The questions determined the knowledge level of preschool personnel about food allergies, anaphylaxis, and treatment. A paired sample *t* test was used to analyze the data and measure the means across the pretest and posttest. The last section of the data collection included an evaluation tool of the presentation and food allergy plan (see Appendix G). This was administered to the participants following the educational in-service program and presentation of the food allergy guidelines. The evaluation was measured on a 5-point Likert-scale item survey. The points ranged from 1, *strongly disagree*, to 5, *strongly agree*. Descriptive statistics was applied to analyze the evaluation data. Utilizing an evaluation instrument helped to conclude if the objectives of the presentation were achieved (Hodges & Videto, 2011).

## Evaluation

I created an evaluation method that the preschool will be able to use to determine the effectiveness of the food allergy policies, EpiPen auto-injector demonstration, and educational

in-service program. The evaluation procedures will be used to determine if the outcome objectives were met. The overall goal of this project was to reduce and prevent the occurrence of food allergy reactions in the preschool setting through the designing and introduction of food allergy policies and increased awareness and education about food allergies for preschool personnel. The first step of the evaluation was to analyze the pretest/posttest and evaluation questionnaires from the participants. This helped to determine the success of the study and what future changes need to be made. The second evaluation process will be for the school to track the number of food allergy reactions that occur each year following the implementation of the policies and education training session. Through collection of this data they will be able to compare incidence rates to before and after the project intervention and determine if there was a decrease in the number of reactions that occur. The final step to the evaluation process will be to measure the adherence to the new policies which will be evaluated through the comparison of emergency action plans and epinephrine auto-injectors the preschool has on site to the number of documented children with food allergies.

### **Summary**

The goal of this project was to create a safer environment for children who have been diagnosed with food allergies. The objective of this plan was to demonstrate an increase in knowledge for preschool personnel through the introduction of food allergy management guidelines and an educational in-service program. Increasing an individual's knowledge will increase their ability to know how and when to react should an anaphylactic situation occur. The format of this program has the ability to create social change and affect childcare centers, preschools, and schools across the country. While most food allergy reactions do not produce an anaphylactic reaction, severe reactions can occur without any warning and preschool personnel

need to be prepared (Vale et al., 2015). My plan for section 4 will be to discuss the results obtained from the performance of this project and what future recommendations can be created. This will include a summary of findings, implications for the future, and recommendations for future studies.

## Section 4: Findings, Implications, Discussion, Recommendations

### **Introduction**

The purpose of this staff educational project was to (a) provide an educational in-service about food allergy management and to (b) introduce evidenced-based practice guidelines to help preschool personnel in the preschool setting to recognize and manage food allergy reactions. Following the introduction of the guidelines and in-service, a post-test was used to determine the increase in the knowledge level of the preschool personnel and their ability to react should a reaction arise. The in-service program and guideline introduction was developed to educate and empower preschool personnel to better manage and treat food allergy reactions. This project was envisioned to be used universally across all preschools.

### **Summary of Findings**

This project was designed to assess the knowledge level of preschool personnel about food allergies and food allergy management and to implement an in-service program and evidenced-based practice guidelines. In this section, I describe the data analysis process that was used to achieve the project outcomes and to compare the pretest and posttest results, which were analyzed using a paired sample *t* test, where the means were measured across the pretest and posttest. Along with a pretest and posttest, they also completed a Likert-scale evaluation of the overall presentation and information presented.

### **Descriptive Characteristics**

The preschool, where the project took place, has children that ranged in age from 6 weeks to 5 years. The education in-service was provided to 24 participants, teachers, assistants, and two directors, all female. In the fall of 2017, when the project was carried out, the facility had 131

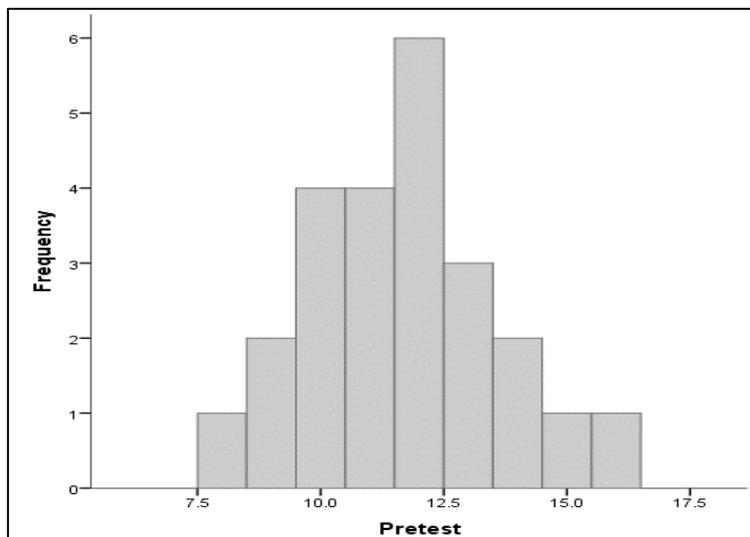
students. Of the 131 students, 12 were documented as having one or more food allergies. Of these 12 children, 2 (16.7%) had a peanut allergy, both of whom had had previous severe allergic reactions; 1 (8.3%) had a tree nut allergy; 3 (25%) had an egg allergy; 4 (33.3%) had a milk allergy; 1 (8.3%) had a strawberry allergy; and 1 (8.3%) was allergic to fruit juice. Three of the 12 (25%) with food allergies had an emergency action plan on the preschool campus, documenting what steps to take should the child have an allergic reaction. These action plans were kept in the child's classroom. Four of the 12 (33.3%) with documented food allergies had an epinephrine auto-injector on the preschool campus; these were kept in the child's backpack in the designated classroom. There were no documented allergic reactions during the previous school year.

### **Data Analysis Procedures**

This project used a quantitative method with a pretest and posttest design to analyze the knowledge level of the preschool personnel before and after the training. The paired *t* test data was analyzed using IBM SPSS 24.0 to determine the effectiveness of the retained knowledge from the educational in-service. The pretest/posttest included a 20-item true/false/I don't know questionnaire, created by the FARE foundation, which assessed the knowledge level of the personnel. The same questionnaire was then administered immediately following the in-service. The information on the questionnaire was in direction relation to what was discussed in the educational in-service. The level of significance of  $p < 0.01$  was found by the paired sample *t* test. Mean, median, and mode were used as the measures of central tendency with standard deviation.

## Results

A histogram was utilized to demonstrate the participants pre-test knowledge level about food allergies (see Figure 2). The diagram defines the mean percentage of the correct answers on the pretest. The pretest concluded with a mean score of 11.67, a median score of 12, a mode of 12, and a standard deviation of 1.95 (see Table 1). Utilizing an overall mean score does not mirror the true knowledge level of each individual preschool personnel, it only defines the overall average score of all the preschool personnel. The pretest scores showed that 29% of the preschool personnel scored less than 50% and 71% scored higher than 50% on the pretest. Frequency of the pretest scores show that 4.2% of the participants scored 40%, 8.3% scored a 45%, 16.7 % scored a 50%, 16.7 scored a 55%, 25% scored a 60%, 12.5% scored a 65%, 8.3 scored a 70%, 4.2% scored a .75, and 4.2% scored a 80% (see Table 2)



*Figure2.* Pretest Scores of Preschool Personnel Participant

Table 1

*Pretest Statistical Analysis*

<i>N</i>	24
Mean	11.67
Median	12
Mode	12
Standard Deviation	1.95

Table 2

*Pretest Scores*

		Pretest			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	8	1	4.2	4.2	4.2
	9	2	8.3	8.3	12.5
	10	4	16.7	16.7	29.2
	11	4	16.7	16.7	45.8
	12	6	25.0	25.0	70.8
	13	3	12.5	12.5	83.3
	14	2	8.3	8.3	91.7
	15	1	4.2	4.2	95.8
	16	1	4.2	4.2	100.0
	Total	24	100.0	100.0	

A histogram was utilized to demonstrate the participants' posttest knowledge level about food allergies (see Figure 3). The diagram defines the mean percentage of the correct answers on the pretest. The posttest concluded with a mean score of 19.88, a median score of 20, a mode of 20, and a standard deviation of 0.34 (see Table 3). Utilizing an overall mean score does not

mirror the true knowledge level of each individual preschool personnel, it only defines the overall average score of all the preschool personnel. The posttest scores showed that 100% of the preschool personnel scored higher than 50% on the pretest. Most significantly, there was an increase in higher percentage values following the educational in-service. Posttest results demonstrated that 87.5% of the participants scored a 100% and 12.9 % scored 95% on the posttest. Frequency of the pretest scores show that 12.5% of the participants scored a 95% and 87.5% of the population tested scored a 100% (see Table 4).

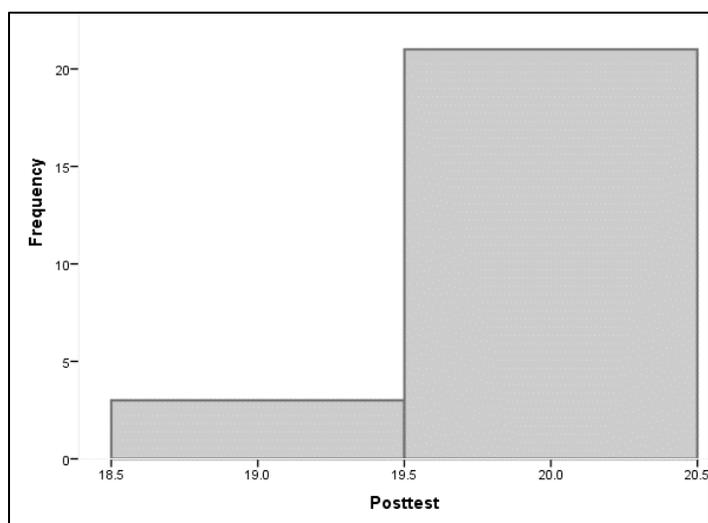


Figure 3. Individual posttest score of each preschool personnel participant

Table 3

*Posttest Statistical Analysis*

<i>N</i>	24
Mean	19.88
Median	20
Mode	20
Standard Deviation	0.34

Table 4

*Posttest Scores*

		Posttest			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	19	3	12.5	12.5	12.5
	20	21	87.5	87.5	100.0
Total		24	100.0	100.0	

Through the utilization of the paired *t* test quantitative research method, there was found to be a significant change in knowledge from the pretest to posttest following the educational in-service. Using the paired sample statistical analysis, there was a substantial increase from the pretest (M= 11.67, SD= 1.95, N= 24) to the posttest (M= 19.88, SD= 0.34, N= 24). The mean between the pretest and the posttest increased by 8.21 with a confidence interval of 95% between the pretest and posttest means of 7.36 to 9.06 (Table 6). Through the performance and understanding of this research method, it is able to provide significant support (level of significance of  $p<0.01$ ) for the practice of education in-services to increase preschool personnel knowledge about food allergy management and recognition.

Table 5

*Paired Samples Statistical Analysis*

		Paired Samples Statistics			
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	11.67	24	1.949	.398
	Posttest	19.88	24	.338	.069

Table 6

*Paired Sample Difference*

		<b>Paired Samples Test</b>							
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Pretest - Posttest	-8.208	2.021	.413	-9.062	-7.355	-19.896	23	.000

The additional data that was collected for this project was a Likert-scale evaluating the in-service and the impact it had on the individual participant. This was analyzed using descriptive statistics in order to demonstrate that the project objectives were achieved. The Likert-scale assessed the instructor, the presentation, the guidelines and policies introduced, and the participant's level of empowerment following the in-service (see Table 7). A significant amount of the participants found the presentation to be very helpful in recognizing the symptoms of a food allergy reaction ( $n=19$ , 79.2%) and feeling empowered in being able to use an epinephrine auto-injector following the in-service demonstration ( $n=20$ , 83.3%). Overall, the participants found the instructor to be knowledgeable about the topic ( $n=22$ , 91.7%) and the presentation to be well presented ( $n=22$ , 91.7%) and felt it was presented in a logical manner. Respondents ( $n=22$ , 91.7%) also believed that the policies and guidelines are necessary in order to care for children with food allergies. The overall rating average for the educational in-service was 4.88.

Table 7

*Evaluation of Food Allergy Educational In-Service*

<b>1. Instructor demonstrated knowledge about the topic.</b>						
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Rating Average	Rating Count
22 (91.7%)	2 (8.3%)	0	0	0	4.92	24
<b>2. The presentation was organized and presented in a logical manner.</b>						
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Rating Average	Rating Count
22 (91.7%)	2 (8.3%)	0	0	0	4.92	24
<b>3. The guidelines were clearly defined and explained.</b>						
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Rating Average	Rating Count
22 (91.7%)	2 (8.3%)	0	0	0	4.92	24
<b>4. I will be able to understand the signs of an allergic reaction.</b>						
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Rating Average	Rating Count
19 (79.2%)	5 (20.8%)	0	0	0	4.79	24
<b>5. I will feel empowered to react should a food allergy reaction occur.</b>						
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Rating Average	Rating Count
20 (83.3%)	4 (16.7%)	0	0	0	4.83	24
<b>Total Average Rating</b>					<b>4.88</b>	

**Implications for the Future**

Based upon the results of the evidenced-based practice project and the increase in knowledge that followed the educational in-service, the results support that educational in-services are instrumental in teaching preschool personnel about food allergy management, recognition, and treatment. There were significant changes noted when understanding food allergies, symptom recognition, treatment protocols, and policies that are in place to help protect children with food allergies. Clinical significance was founded through the preschool personnel feeling more empowered to react should a food allergy reaction arise.

## **Practice**

The practice implications that were addressed in this project were related to increasing knowledge about food allergy management in the preschool setting. This project was able to educate preschool teachers about how to manage, recognize, and treat food allergy reactions. It was able to increase awareness about the prevalence of food allergies in the pediatric population and the potential severity that can come from food allergy reactions. This project was able to demonstrate that when a food allergy educational in-service is implemented and guidelines for managing food allergies are introduced, there can be an increase in knowledge and empowerment to react to the emergent situation. While this project is limited in sample size and generalizability, it was able to demonstrate the effectiveness that a food allergy educational program can have on preschool personnel. The implications for providing education about food allergy management in the preschool setting have been well conveyed in this project. As pediatric nurses, one of the primary roles is to ensure that caretakers of children have the necessary education and training to provide a safe and healthy environment. Through the development of educational programs such as this, pediatric nurses have the ability to positively affect the outcomes that children with food allergies may face. This includes advocating for policy changes and improved evidenced-based practice changes that are crucial to the safety of children with food allergies.

## **Theory**

The adult learning theory, the theory of self-efficacy, and the ACE star model were all used to direct the course of this evidenced-based project. Knowles assumptions of the adult learner were applied throughout the creation of the food allergy education program. According to

Knowles (1973), adults will show interest in the topic if they understand how it will relate and become integrated into their job. The six assumptions were found to be accurate in what to presume with the adult learner along with how to engage and teach the adult learner on the planned topic. Albert Bandura's theory of self-efficacy was also applied to the development of the educational in-service and outcomes. Bandura (1986), believed that through education, an individual will feel more empowered to react should a situation arise. This was proved accurate following the educational in-service based upon the results of the evaluation tool when 83.3% of the participants felt more empowered to react should an allergic reaction occur. Lastly, the ACE star conceptual model was used to combine the research evidence with the current recommended food allergy practice guidelines in order to improve the quality and safety of care provided to preschool children and the outcomes that they experience from food allergy reactions. Through the integration of the two theories and conceptual framework into food allergy practice changes, education programs, policies, and guidelines can be created and transformed in order to create a safer environment for children with food allergies.

## **Research**

Food allergy educational programs are essential to the safety of children who are challenged with food allergies. Creating educational programs for preschools that are aligned with the FARE Foundation's standards is the most effective method for creating the safest environment. According to the FARE Foundation (2014), implementing food allergy educational programs has the potential to greatly decrease the number of reactions and hospitalizations that occur each year from children not receiving the appropriate treatment. The documents that are included with the FARE educational presentation, including the emergency action plan and

directions for using an epinephrine injection, are also crucial to the necessary changes that need to occur in the preschool to ensure safety for the children with food allergies.

The research study was able to provide evidence that implementing educational in-service and introducing recommended food allergy guidelines can increase the knowledge and empowerment of teachers to be able to manage, recognize, and treat food allergy reactions. Nevertheless, while this is information that can be applied to other preschools, it will be necessary to study the long term effects of implementing these guidelines into the preschool setting and if it has the ability to decrease the overall incidence rate. Studies that have been performed previous to this study have also shown where knowledge and empowerment has increased following food allergy educational programs (Foster et al., 2015). Preschool-based food allergy education programs have the ability to decrease food allergy reactions in the preschool setting and potentially save the lives of children with severe food allergies.

### **Social Change**

The integration of evidenced-based practice guidelines have the ability to improve safety measures in the preschool setting and potentially prevent a severe to fatal episode from transpiring. Administrators and preschool personnel, with increased knowledge about food allergies, can ensure that children with food allergies will implement the proper safety measures put into place to prevent a food allergy reaction from occurring and treating reactions appropriately should one happen. Some methods for ensuring safety include annual food allergy educational in-services and implementing the recommended evidenced-based practice guidelines including emergency actions plans and having an epinephrine auto-injector on site for each child with a food allergy. Based upon the need and request for education being stated by teachers,

because they feel inadequately prepared, it is crucial to ensure they are receiving the necessary training in order to create a safer environment (Ravarotto et al., 2014). Through staff education and quality improvement changes, this study could have a major impact on the number of adverse events that occur yearly due to food allergy reactions.

### **Discussion**

The objective of this study was to determine if an educational in-service and recommended evidenced-based practice guidelines could increase the knowledge of preschool personnel to feel more empowered to manage, recognize, and treat food allergies and reactions. This project was originally created based upon the increasing need for preschool personnel to be prepared should a food allergy reaction arise. Safety is a crucial aspect of the child care industry, and with the increasing food allergy rate in the pediatric population it is essential to confirm that preschool personnel are prepared to react.

### **Strengths**

Through the implementation of the staff education evidenced-based project, it was demonstrated that there was an overall increase in the level of knowledge regarding food allergy management, symptom recognition, and treatment of allergic reactions. There was also a demonstration of increased knowledge concerning food allergy policies and recommended guidelines such as the emergency action plan, requiring an epinephrine auto-injector to be on site for each child with a food allergy, and also supporting that recommendation of annual food allergy training in-services. This project was also able to provide an opportunity for education and communication to occur between preschool personnel and administration. The participants were able to discuss how this could impact the preschool and potential changes that needed occur

in order to create a safer atmosphere. All participants who participated in the project received a copy of the Food Allergy Research and Education Foundation PowerPoint (Appendix B) that was utilized during the in-service, recommendations for reducing the risk of exposure to food allergens (Appendix A), an emergency action plan (Appendix C), and step-by-step guidelines of how to utilize an epinephrine auto-injector (Appendix D). The participants were also provided a demonstration of how to use the epinephrine auto-injector and were able to practice with trainer-injector devices. While participants had to utilize their time and the preschool campus for this project, there were no financial cost that were incurred.

### **Limitations**

The first limitation was the demographics and participant selection. There were no personal demographics collected prior to the administration of the educational in-service, including whether or not any of the preschool personnel had prior food allergy and anaphylaxis training. The participation population also consisted of all females, as there are no male preschool personnel. For future studies it is recommended to have a more diverse population. A second limitation of the study was in relation to the survey itself. The participants did not receive prior education regarding the terms that were utilized in the pretest, posttest, and evaluation, which could have potentially affected how they answered the questions. A final limitation for this project is the small sample size of the child population in the preschool and the participant rate. Research studies that consists of a small sample size can cause the statistical power of the outcomes to be limited and unable able to show accurate significance of the study.

## **Recommendations**

Based upon the resulted outcomes of the evidenced-based staff education in-service and introduction of evidenced-based practice guidelines, it is recommended that the preschool will implement and utilize the most current food allergy policies. This will include having an emergency action plan for every child that has a food allergy diagnosis, having an epinephrine auto-injector on campus for every child that has a food allergy diagnosis, and that the preschool will continue to provide annual food allergy educational in-services for all preschool personnel and volunteers. It is recommended that the food allergy policies be reviewed annually by administration and verify that the best practices are being followed. Lastly, it is recommended that these new policies and required training in-services be included in the parent handbook for the preschool that is presented with registration. This will allow the parents to understand the safety precautions that are being taken in order to protect children with food allergies. As safety is considered to be a central foundation of the preschool, following these implications will be consistent with their overall duty and mission to provide a safe environment for the children.

Through surveying the preschool, it was found that they were lacking food allergy policy guidelines in order to ensure that the children with food allergies were appropriately protected. While the basic recommendations of food avoidance and wiping down tables were followed, the preschool personnel had never received any formal training on how to manage, recognize and treat food allergy reactions. In doing this project, the preschool was educated on how policies that could be implemented in their setting in order to provide a safer environment. While the project has limited generalizability, it could be modified beyond this preschool setting and have the ability to positively affect the food allergy community. The recommendations can be utilized

by administrators, school nurses, teachers, kitchen aids, and volunteers who are considered caretakers of children.

### **Summary**

This section discussed the quantitative research method that was utilized to study the effects that an educational in-service about food allergy management, recognition, and treatment, along with recommended guidelines can have on preschool personnel. There were 24 participants who participated in the research study. It was demonstrated through the study that implementing an educational in-service and introducing food allergy management guidelines can have a positive impact on the knowledge level of the participant. This project showed an increase in score levels on the posttest verses the pretest questionnaire following the educational in-service. Based upon the self-evaluations following the in-service, the participants also felt more empowered to react should an allergic reaction arise. While the study has limited statistical significance because of the participant sample size and demographic population, it was able to demonstrate clinical significance. The study was able to validate that a true difference exists between the knowledge level prior to the educational in-service and post-educational in-service. In Section 5, I offer the dissemination plan, a self-analysis, and a summary of the evidence-based project.

## Section 5: Dissemination Plan, Analysis of Self, Summary

### **Introduction**

The purpose of this evidenced-based practice project was to determine if an in-service and the introduction of recommended guidelines would increase the knowledge of preschool personnel such that they would feel more prepared should an allergic reaction arise. In the previous section, the statistical analysis demonstrated that the educational in-service increased the knowledge level of the preschool personnel. According to Bandura (1986), with increased knowledge comes increased empowerment to react in an emergency situation.

The purpose of Section 5 is to provide the dissemination plan for the project on a local and national level, perform a self-analysis following the evidence-based practice project, and summarize the evidence-based project.

### **Dissemination Plan**

The method of dissemination for the educational in-service and recommended guidelines for the food allergy management was through a PowerPoint presentation. All participants who participated in the project received a copy of the Food Allergy Research and Education Foundation PowerPoint (Appendix B) that was utilized during the in-service, recommendations for reducing the risk of exposure to food allergens (Appendix A), an emergency action plan (Appendix C), and step-by-step guidelines of how to utilize an epinephrine auto-injector (Appendix D). The participants were also provided a demonstration of how to use the epinephrine auto-injector and were able to practice with trainer-injector devices. PowerPoint presentations are one of the most useful ways for providing education. This type of presentation can be made as colorful and attractive visual aids that can be modified easily and also allows for

easier dissemination to the participants. It provides the participants with an educational document they can save and refer too, versus a guest speaker presenting without any visual aids that the participants can keep post in-service. The PowerPoint presentation delivers the message in a consistent and logical manner and allows for the opportunity of participant engagement. Participant engagement allows for a deeper level of understanding and to acquire a more in-depth knowledge foundation (Nasrin, Soroor, & Soodabeh, 2012).

This project could be published in two other venues: a poster presentation or a journal. The poster presentations could be made at the annual Arkansas School Nursing Conference and the American Academy of Allergy, Asthma, and Immunology Annual Meeting and World Allergy Organization Meeting in 2018. This would provide nurses, physicians, and researchers with the most current information regarding challenges with food allergies in the preschool setting and a method for addressing these challenges. Presenting at these two conferences would allow for the project to reach a national level and impact the entire food allergy community. Journal publications would allow this evidence to reach a national level. Two journals will be considered: *The Journal of Pediatric Nursing* and *The Journal of School Nursing*. The development of a dissemination plan will enable the translated evidence to reach end users and be put into practice (Henriksen, Battles, & Marks, 2005).

### **Analysis of Self**

As a DNP student, I have greatly increased my level of knowledge in relation to leadership, policy and practice changes, and translating evidence into practice. The skills that I have developed through the performance of this study will further impact my future nursing profession. Leadership is a primary competency for practicing as a doctorate level nurse. This

project has influenced my overall professional goals of being a leading, knowledgeable, evidenced-based practitioner in the pediatric community and further improving the lives and safety of children who are challenged with food allergies. Through this new and expanded knowledge base, I will have an understanding of where and in what ways impacts need to be made, and will have the ability to create constructive societal changes in healthcare institutions, educational atmospheres, and community and patient development. Patient advocacy is something that I continually strive for and with gaining a deeper intellectual nursing knowledge, and with the ability of how to apply it, it will give me a greater foundation for achievement.

While the journey of this doctorate project has been difficult and challenging, it will further improve my intellectual understanding of the nursing profession and how to innovatively effect the nursing and patient community. According to the Walden outcomes, one of the primary missions is encourage students to understand and continuously develop and change themselves (Walden University, 2016-2017). This project has enabled me to become a deeper thinker about my future and the impact that I can have on society.

### **Summary of the Project**

The purpose of this project was to answer the following question: Does the implementation of food allergy evidenced-based practice guidelines and educational in-service program help to increase the knowledge of school personnel to better manage food allergies and reactions in the preschool setting? Through the conduction of a literature review it was discovered that there is a practice problem in the preschool community in relation to food allergy management, symptom recognition, and treatment protocols. Based upon these findings, an educational in-service intervention was created along with recommend guidelines for managing

food allergies in the preschool setting. The pre and post-knowledge level of the participants were measured to document the overall outcomes of the in-service. This evidenced-based practice project was able to demonstrate a direct relationship between an educational in-service and increased knowledge level about food allergy management. Staff education was found to be an effective method for increasing knowledge about food allergies. The evidence composed through this project further confirms the need for annual staff education, emergency action plans for food allergies, and requiring an epinephrine auto-injector on campus for each child with a food allergy.

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## Appendix A

## Site Approval Documentation for Staff Education Doctoral Project

Form A

## Site approval documentation for Staff Education Doctoral Project

Kim Huggins- Mother's Day Out Director  
Becky Talbert- Weekday Preschool Director  
First Baptist Church of Benton, Arkansas  
211 South Market St.  
Benton, AR 72015  
(501) 315-2270

August 28, 2017

The doctoral student, Katherine Crow, is involved in Staff Education that will be conducted under the auspices of our organization. The student is approved to collect formative and summative evaluation data via anonymous staff questionnaires, and is also approved to analyze internal, de-identified site records that I deem appropriate to release for the student's doctoral project. This approval to use our organization's data pertains only to this doctoral project and not to the student's future scholarly projects or research (which would need a separate request for approval).

I understand that, as per DNP program requirements, the student will publish a scholarly report of this Staff Development Project in Proquest as a doctoral capstone (with site and individual identifiers withheld), as per the following ethical standards:

- a. In all reports (including drafts shared with peers and faculty members), the student is required to maintain confidentiality by removing names and key pieces of evidence/data that might disclose the organization's identity or an individual's identity or inappropriately divulge proprietary details. If the organization itself wishes to publicize the findings of this project, that will be the organization's judgment call.
- b. The student will be responsible for complying with our organization's policies and requirements regarding data collection (including the need for the site IRB review/approval, if applicable).
- c. Via a Consent Form for Anonymous Questionnaires, the student will describe to staff members how the data will be used in the doctoral project and how the stakeholders' autonomy and privacy will be protected.

I confirm that I am authorized to approve these activities in this setting.

Signed,



Kim Huggins  
Mother's Day Out Director

## Appendix b

**Reducing the Risk of Exposure**

## Reducing the Risk of Exposure to Food Allergens

Recommendations from the Centers for Disease Control and Prevention (CDC)

On October 30, 2013, the CDC published national guidelines for food allergy management in schools. The recommended practices below can be found on p.41-43 of the CDC Guidelines.

### Classroom

- Avoid the use of identified allergens in class projects, parties, holidays and celebrations, arts, crafts, science experiments, cooking, snacks, or rewards. Modify class materials as needed.
- Use non-food incentives for prizes, gifts, and awards.
- Avoid ordering food from restaurants because food allergens may be present, but unrecognized.
- Encourage children to wash hands before and after handling or consuming food.
- Have rapid access to epinephrine auto-injectors in cases of food allergy emergency and train staff to use them.
- Help students with food allergies read labels of foods provided by others so they can avoid ingesting hidden food allergens.
- Consider methods (such as assigned cubicles) to prevent cross-contact of food allergens from lunches and snacks stored in the classroom.
- Consider designated allergy-friendly seating arrangements.
- Support parents of children with food allergies who wish to provide safe snack items for their child in the event of unexpected circumstances.
- Include information about children with special needs, including those with known food allergies, in instructions to substitute teachers.

### Cafeteria

- Encourage children, school staff, and volunteers to wash hands before and after handling or consuming food.
- Wash all tables and chairs with soap and water or all-purpose cleaning agents before each meal period.
- Consider **designated allergy-friendly seating during meals (open to any child eating foods free of identified allergens)**.
- With parental cooperation, create standard procedures for identifying children with food allergies. For example, a recent picture of each child could be kept in a location that is not visible to other children or the public. Procedures must follow the requirements in FERPA. (See Section 5 for more information about FERPA.)
- Make reasonable meal accommodations after receiving approval from a doctor or allergist through dietary orders or as stated in the child's Emergency Care Plan (ECP). For more information, see the USDA Web site.\*
- Provide advanced copies of menus for parents to use in planning.
- Be prepared to share food labels, recipes, or ingredient lists used to prepare meals and snacks with others.
- Keep current contact information for vendors and suppliers so you can get food ingredient information.
- Read all food labels and re-check with each purchase for potential food allergens.
- Designate an allergen-safe food preparation area.
- Keep food labels from all foods served to children with allergies for at least 24 hours after serving the food in case the child has a reaction.
- Report mistakes such as cross-contact with an allergen or errors in the ingredient list or menu immediately to administrators and parents.
- Have rapid access to epinephrine auto-injectors in cases of food allergy emergency and train staff to use them.

## Reducing the Risk of Exposure to Food Allergens



### Transportation

- Train transportation staff in how to respond to food allergy emergencies.
- Have rapid access to epinephrine auto-injectors in cases of food allergy emergency and train staff to use them.
- Encourage children to wash hands before and after handling or consuming food.
- Do not allow food to be eaten on buses except by children with special needs such as those with diabetes.

### School or ECE Program Events (Field Trips, Activities Before or After School)

- Do not exclude children with food allergies from field trips, events, or extra-curricular activities.
- When planning a field trip, find out if the location is safe for children with food allergies.
- Identify special needs before field trips or events.
- Invite, but do not require, parents of children with food allergies to accompany their child in addition to the regular chaperons.
- Make sure that events and field trips are consistent with food allergy policies.
- Package meals and snacks appropriately to prevent cross-contact.
- Encourage children to wash hands before and after handling or consuming food.
- Have rapid access to epinephrine auto-injectors in cases of food allergy emergency and train staff to use them.

### Physical Education and Recess

- Do not exclude children with food allergies from physical education or recess activities.
- Encourage hand washing before and after handling or consuming food.
- Have rapid access to epinephrine auto-injectors in cases of food allergy emergency and train staff to use them.

We encourage you to learn more about food allergy management in schools by reviewing the entire CDC Guidelines document at: [www.foodallergy.org/cdc](http://www.foodallergy.org/cdc).



[www.foodallergy.org](http://www.foodallergy.org)

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## Appendix C

## FARE PowerPoint Presentation



## Food Allergies: Keeping Students Safe and Included

FARE Education Network



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### Objectives

1. Improve understanding of food allergies and anaphylaxis.
2. Identify laws that protect individuals with food allergies.
3. Identify ways that school staff can create a safer and more inclusive school environment for students with food allergies.
4. Learn how to PLAN for, RECOGNIZE, and RESPOND to a food allergy reaction.

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### About this Presentation

- This presentation was developed by Food Allergy Research & Education (FARE).
- For more information, visit [www.foodallergy.org](http://www.foodallergy.org).

The FARE Education Network and training materials are made possible by an unrestricted sponsorship from Mylan Specialty L.P.



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## Food Allergy by the Numbers



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### Disclaimer/Liability

- This presentation is for food allergy education, information and training purposes only. While every effort has been made to ensure the information in this presentation is accurate and up to date for school food allergy management, this presentation is not intended to be a substitute for professional legal advice, medical advice, or diagnosis or treatment, and the information in this presentation does not supersede or replace existing state or federal laws and regulations.
- FOOD ALLERGY RESEARCH & EDUCATION ("FARE"), ITS REPRESENTATIVES, PARTNERS, EMPLOYEES AND VOLUNTEERS CANNOT GUARANTEE ABSOLUTE PREVENTION OF A FOOD ALLERGY REACTION OR EMERGENCY IN YOUR FACILITY AND HEREBY DISCLAIM ANY AND ALL LIABILITY ASSOCIATED WITH ANY FOOD ALLERGY REACTION ON YOUR PREMISES OR IN CONJUNCTION WITH FOLLOWING THE GUIDELINES SET FORTH IN THIS PRESENTATION OR ANY ADVICE BY FARE.

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### Food Allergy is a Serious Public Health Issue...



# 15 million

## Americans with food allergies

Food Allergy Research & Education [www.foodallergy.org](http://www.foodallergy.org)

## Affecting a Growing Number of Children

includes

# 5.9 million

children (1 in 13)



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## Food Allergy Is On the Rise

- According to a 2013 report by the Centers for Disease Control and Prevention, there was a 50 percent increase in food allergy between 1997 and 2011.<sup>1</sup>
- In addition, almost 1 in 3 children with a food allergy have multiple food allergies.<sup>2</sup>



<sup>1</sup> Jackson, K., Howe, L., Akiba, L. Trends in Allergic Conditions Among Children - United States, 1997-2011. National Center for Health Statistics Data Brief. 2013. Retrieved from [www.cdc.gov/nchs/data/databriefs/db121.pdf](http://www.cdc.gov/nchs/data/databriefs/db121.pdf)

<sup>2</sup> Gupta RS, Springston MR, Warner BS, Rajesh K, Pongroic J, Holl JL. The prevalence, severity, and distribution of childhood food allergy in the United States. J Pediatr. 2011; 118:doi: 10.1016/j.jpeds.2011.02.04

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## Understanding Food Allergies and Reactions



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## What is a food allergy?

- A food allergy occurs when the immune system mistakenly targets a harmless food protein – an allergen – as a threat and attacks it.
- Food allergies can be life-threatening.
- There is no cure for food allergy.



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## Food Intolerance vs. Food Allergy

### Food Intolerance

- A reaction to food that does not involve the immune system and is not life-threatening.
  - Example: Lactose intolerance – trouble digesting lactose, a natural sugar found in milk, resulting in gas, bloating, stomach cramps, diarrhea.

### Food Allergy

- A potentially serious reaction to food that DOES involve the immune system.
- Can be life-threatening.
  - Example: Milk allergy – an immune response to milk protein, ingestion of milk can result in hives, wheezing, low blood pressure, and potentially death.

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## Common Food Allergens

- Eight foods are responsible for the majority of food allergy reactions in the United States:<sup>1</sup>



Peanut



Tree nuts



Milk



Egg



Wheat



Soy



Fish



Shellfish (Crustacean – crab, lobster, etc.)

- A person can be allergic to virtually ANY food
- ALL food allergies need to be taken seriously

<sup>1</sup> U.S. Food and Drug Administration (FDA). Food Allergies: What You Need to Know. U.S. Department of Health & Human Services. 2014. [www.fda.gov/food/resourcesforyou/consumers/gum073111.htm](http://www.fda.gov/food/resourcesforyou/consumers/gum073111.htm). Accessed Oct. 20, 2014.

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## What is anaphylaxis?

- Anaphylaxis is a severe allergic reaction that is rapid in onset, and may cause death.
- It is a medical emergency and time is of the essence.
- Studies show fatal reactions are associated with a delay in receiving epinephrine.<sup>1, 2</sup>
- Food allergy is the leading cause of anaphylaxis outside of the hospital setting.

<sup>1</sup> Bock SA, Muñoz-Furlong A, Sampson H. Further fatalities caused by anaphylactic reactions to food, 2001-2006. *J Allergy Clin Immunol*. 2007; 119(4): 1015-8.

<sup>2</sup> Bock SA, Muñoz-Furlong A, Sampson HA. Fatalities due to anaphylactic reactions to foods. *J Allergy Clin Immunol*. 2001; 107(1): 191-3.

## How is anaphylaxis treated?

- Immediate treatment with an epinephrine auto-injector is critical and may mean the difference between life and death.
- Antihistamines will NOT help with a severe reaction.
- A SECOND DOSE of epinephrine may need to be administered if symptoms are not improving in 5-10 minutes.

## How common is anaphylaxis?

- 40 percent of children with food allergies have experienced a severe or life-threatening reaction.<sup>1</sup>
- A food allergy reaction sends someone to the emergency room every 3 minutes, resulting in 210,000 visits each year.<sup>2</sup>



<sup>1</sup> Gupta RS, Springston MR, Warner BS, Rajesh K, Pongracic J, Hill JL. The prevalence, severity, and distribution of childhood food allergy in the United States. *J Pediatr*. 2011; 128 doi: 10.1016/j.jpeds.2011.02.044.

<sup>2</sup> Clark S, Espinola JA, Rudders SA, Banerji A, and Camargo CA. Favorable trends in the frequency of U.S. emergency department visits for food allergy, 2001-2009. *Allergy Asthma Proc*. 2013 Sep-Oct;34(5):439-46.

## Laws, Regulations, and Food Allergies



## How common are reactions at school?

- One in six children with food allergies has had an allergic reaction while at school.<sup>1</sup>
- About 25 percent of severe reactions at school happened to individuals with no previous diagnosis of a food allergy.<sup>2</sup>

**REMEMBER!** It's important for everyone teaching or caring for students to understand how to recognize and treat a severe allergic reaction.

<sup>1</sup> Centers for Disease Control and Prevention (CDC). *Voluntary Guidelines for Managing Food Allergies in Schools and Early Care and Education Programs*. Washington, DC: US Department of Health and Human Services; 2013.

<sup>2</sup> Scherer S, Mahi T, & the Section on Allergy and Immunology (2010). Clinical Report - Management of Food Allergy in the School Setting. *Journal of the American Academy of Pediatrics*. doi: 10.1094/peds.2010.2575.

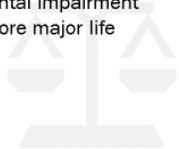
## Food Allergy and Federal Law

- There are several laws and regulations that may govern food allergies in schools and early care and education programs including, but not limited to:
  - Section 504 of the Rehabilitation Act
  - Americans with Disabilities Act (ADA)
  - Individuals with Disabilities Education Act (IDEA)
  - Family Educational Rights and Privacy Act (FERPA)

Learn more about federal laws and other legal regulations on pages 92-95 of the CDC's *Voluntary Guidelines for Managing Food Allergies in Schools and Early Care and Education Programs* at [www.foodallergy.gov/cdc](http://www.foodallergy.gov/cdc).

## Food Allergy and Federal Law (cont'd)

- Food allergies may constitute a disability under federal laws such as Section 504 of the Rehabilitation Act and the Americans with Disabilities Act (ADA).
- The ADA defines a person with a disability as a person who has a physical or mental impairment that substantially limits one or more major life activities.



## Avoid the Allergen

- Read every label, every time
  - If a food does not have an ingredient label, it shouldn't be eaten
  - Be aware of "may contain" and other precautionary statements
- Avoid home-baked goods because they are at a higher risk for cross-contact
- Restrict identified allergens from the classroom. (including projects, crafts, science experiments, etc.).
  - Unexpected sources of food allergens such as: birdhouse feeders, empty egg and milk cartons, planting seeds, finger paint, etc.
- Use non-edible treats for celebrations

## Safe Participation in School Activities

- When a student's food allergy is a disability and the student needs accommodations or services, the student should be evaluated for a Section 504 plan.
- A 504 plan should include:
  - The accommodations or services needed for the student to be safely included in school activities
  - The emergency care plan (or health care plan) that explains how to treat an allergic reaction
  - Procedural safeguards

An individual health care plan is *not* the same as a Section 504 plan.

## Prevent a Reaction

- Encourage hand washing for students and staff before and after handling or consuming food.
  - Hand sanitizers are not effective in removing food allergens.
- Wash all tables and chairs with soap and water or all-purpose cleaning agents.
- Offer allergy-friendly seating arrangements in the cafeteria so that students with food allergies are safe, but not eating alone.
- Ensure that students with food allergies are safely included in school events and celebrations

A complete list of the CDC's recommended practices and accommodations are included in the *Food Allergies: Keeping Students Safe and Included* Companion Guide, as well as on pages 41-43 of the *CDC's Voluntary Guidelines for Managing Food Allergies in Schools and Early Care and Education Programs*.

## Avoidance and Prevention



## Protecting a Student's Physical Health



## PLAN, RECOGNIZE, RESPOND

1. **PLAN** for food allergy reactions.
2. Know how to **RECOGNIZE** a reaction.
3. Know how to **RESPOND** to a reaction.



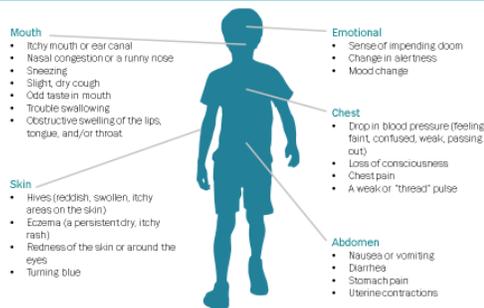
## RECOGNIZE: What will a reaction look like?

- Severity of reactions can vary.
- Once a reaction starts, there is no way to predict how it will go.
- A seemingly mild reaction can turn life-threatening within minutes.
- It is possible to have anaphylaxis, including severe and fatal anaphylaxis, without skin symptoms. Do not discount an allergic reaction or anaphylaxis because you do not see hives.

## PLAN: Emergency Care Plan

- Every student with a diagnosed food allergy should have an Emergency Care Plan (ECP).
- The ECP will let you know when to use the epinephrine auto-injector or other medication for an individual student.
- Make sure students have quick access to an epinephrine auto-injector, both at school and during school-related events.

## RECOGNIZE: Symptoms of an Allergic Reaction



## PLAN: FARE's Food Allergy & Anaphylaxis Emergency Care Plan

## RESPOND: Act Fast, Seconds Count

- For serious reactions, **act quickly**:
  - Give epinephrine.
  - Call **911** and tell the operator that a student is having an anaphylactic reaction.
  - Ask for an ambulance equipped with epinephrine and staff trained to use it.
  - Lay person flat, raise legs and keep warm. If breathing is difficult or they are vomiting, let them sit up or lie on their side.
- Second dose of epinephrine may be necessary if symptoms have not subsided in 5-10 minutes.

## RESPOND: Symptoms can return!

- All students having a reaction must receive follow-up treatment and be monitored closely.
- In some food allergy reactions, after the first symptoms go away, a second wave of symptoms can start several hours later.
- This is called a **biphasic reaction**.

## Create a Positive School Environment

Children with food allergies need an environment where they feel secure and can interact with caring people they trust.

### Promote and reinforce a supportive environment

- Avoid using language and activities that isolate children with food allergies
- Encourage everyone's help in keeping the classroom safe from food allergens
  - Children can help develop classroom rules, rewards, and activities
- Develop rules and policies against bullying behavior
  - Post in buildings, publish in school handbooks, discuss with staff, students, and families
  - Encourage staff and students to report bullying and harassment

### Provide food allergy education and awareness

- Improve social interactions
- Reduce peer pressure
- Decrease risk-taking behaviors that expose students to food allergens
- Promote safety, respect, and acceptance of difference

## Protecting a Student's Emotional Health



## Getting Started



## The Emotional Impact

About one-third of kids with food allergies report that they have been bullied specifically because of their allergies.<sup>1</sup>

### Bullying

- Students with food allergies may be teased, taunted and harassed.
  - Waving the allergen in front of the student.
  - Being forced to touch the food they are allergic to.
  - Having the food they are allergic to rubbed on them or thrown at them.

### Social Isolation

- When students with food allergies cannot participate and are not included in classroom and school activities, it can cause emotional distress.

<sup>1</sup> Shenkell E, Ammendato RA, Ambrose MA, Ravid NL, Mullarkey C, Rubes M, Chuang K, Sicherer M, Sicherer SH. Child and parental reports of bullying in a consecutive sample of children with food allergy. *Pediatrics*. 2015 Jan;135(1):e10-7. doi: 10.1542/peds.2012-1180.

## A Team Approach

- At the core of managing students with food allergies is a strong partnership and shared responsibility among school staff, children and their families, and the family's allergist or other physician.



### Where can schools start?

- Review the CDC's *Voluntary Guidelines for Managing Food Allergies at School and Early Care and Education Programs*, available at [www.foodallergy.org/CDC](http://www.foodallergy.org/CDC).
- Establish and carry out a plan to identify every student with a food allergy.
- Have immediate access to medication.
- Become familiar with federal and state laws.
- Develop a school-wide or district-wide food allergy policy.
- Offer annual food allergy training and professional development to ensure staff are familiar with policies and are able to recognize and treat an allergic reaction.

### For More Information

- Food Allergy Research & Education (FARE)
  - Website: [www.foodallergy.org](http://www.foodallergy.org)
  - Email: [education@foodallergy.org](mailto:education@foodallergy.org)
- FARE Education Network
  - Website: [www.foodallergy.org/education-network](http://www.foodallergy.org/education-network)
  - Additional Documents: Companion Guide , Quiz
- Centers for Disease Control and Prevention (CDC) Adolescent and School Health page
  - Website: [www.cdc.gov/healthyyouth/foodallergies/](http://www.cdc.gov/healthyyouth/foodallergies/)

# Thank you!

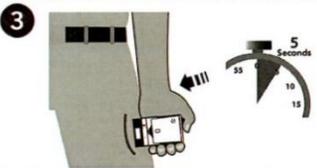
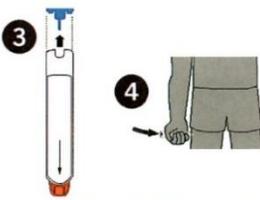
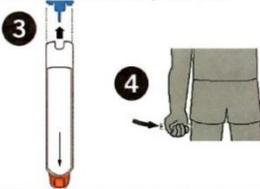
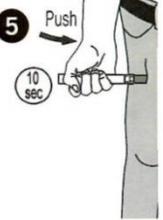
## Appendix D

## FARE Emergency Action Plan

<b>FARE</b> FOOD ALLERGY & ANAPHYLAXIS EMERGENCY CARE PLAN <small>Food Allergy Research &amp; Education</small>		PLACE PICTURE HERE																							
Name: _____ D.O.B.: _____																									
Allergy to: _____																									
Weight: _____ lbs. Asthma: <input type="checkbox"/> Yes (higher risk for a severe reaction) <input type="checkbox"/> No																									
NOTE: Do not depend on antihistamines or inhalers (bronchodilators) to treat a severe reaction. USE EPINEPHRINE.																									
Extremely reactive to the following allergens: _____ THEREFORE: <input type="checkbox"/> If checked, give epinephrine immediately if the allergen was LIKELY eaten, for ANY symptoms. <input type="checkbox"/> If checked, give epinephrine immediately if the allergen was DEFINITELY eaten, even if no symptoms are apparent.																									
<p style="text-align: center;"><b>FOR ANY OF THE FOLLOWING: SEVERE SYMPTOMS</b></p> <table style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> </tr> <tr> <td><b>LUNG</b> Shortness of breath, wheezing, repetitive cough</td> <td><b>HEART</b> Pale or bluish skin, faintness, weak pulse, dizziness</td> <td><b>THROAT</b> Tight or hoarse throat, trouble breathing or swallowing</td> <td><b>MOUTH</b> Significant swelling of the tongue or lips</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>SKIN</b> Many hives over body, widespread redness</td> <td><b>GUT</b> Repetitive vomiting, severe diarrhea</td> <td><b>OTHER</b> Feeling something bad is about to happen, anxiety, confusion</td> <td><b>OR A COMBINATION</b> of symptoms from different body areas.</td> </tr> </table> <p style="text-align: center;">↓      ↓      ↓</p> <ol style="list-style-type: none"> <li>1. <b>INJECT EPINEPHRINE IMMEDIATELY.</b></li> <li>2. <b>Call 911.</b> Tell emergency dispatcher the person is having anaphylaxis and may need epinephrine when emergency responders arrive.             <ul style="list-style-type: none"> <li>• Consider giving additional medications following epinephrine:                 <ul style="list-style-type: none"> <li>» Antihistamine</li> <li>» Inhaler (bronchodilator) if wheezing</li> </ul> </li> <li>• <b>Lay the person flat, raise legs and keep warm. If breathing is difficult or they are vomiting, let them sit up or lie on their side.</b></li> <li>• If symptoms do not improve, or symptoms return, more doses of epinephrine can be given about 5 minutes or more after the last dose.</li> <li>• Alert emergency contacts.</li> <li>• Transport patient to ER, even if symptoms resolve. Patient should remain in ER for at least 4 hours because symptoms may return.</li> </ul> </li> </ol>					<b>LUNG</b> Shortness of breath, wheezing, repetitive cough	<b>HEART</b> Pale or bluish skin, faintness, weak pulse, dizziness	<b>THROAT</b> Tight or hoarse throat, trouble breathing or swallowing	<b>MOUTH</b> Significant swelling of the tongue or lips					<b>SKIN</b> Many hives over body, widespread redness	<b>GUT</b> Repetitive vomiting, severe diarrhea	<b>OTHER</b> Feeling something bad is about to happen, anxiety, confusion	<b>OR A COMBINATION</b> of symptoms from different body areas.	<p style="text-align: center;"><b>MILD SYMPTOMS</b></p> <table style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> </tr> <tr> <td><b>NOSE</b> Itchy or runny nose, sneezing</td> <td><b>MOUTH</b> Itchy mouth</td> <td><b>SKIN</b> A few hives, mild itch</td> <td><b>GUT</b> Mild nausea or discomfort</td> </tr> </table> <hr/> <p style="text-align: center;"><b>FOR MILD SYMPTOMS FROM MORE THAN ONE SYSTEM AREA, GIVE EPINEPHRINE.</b></p> <hr/> <p style="text-align: center;"><b>FOR MILD SYMPTOMS FROM A SINGLE SYSTEM AREA, FOLLOW THE DIRECTIONS BELOW:</b></p> <ol style="list-style-type: none"> <li>1. Antihistamines may be given, if ordered by a healthcare provider.</li> <li>2. Stay with the person; alert emergency contacts.</li> <li>3. Watch closely for changes. If symptoms worsen, give epinephrine.</li> </ol>					<b>NOSE</b> Itchy or runny nose, sneezing	<b>MOUTH</b> Itchy mouth	<b>SKIN</b> A few hives, mild itch	<b>GUT</b> Mild nausea or discomfort
<b>LUNG</b> Shortness of breath, wheezing, repetitive cough	<b>HEART</b> Pale or bluish skin, faintness, weak pulse, dizziness	<b>THROAT</b> Tight or hoarse throat, trouble breathing or swallowing	<b>MOUTH</b> Significant swelling of the tongue or lips																						
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<p style="text-align: center;"><b>MEDICATIONS/DOSES</b></p> Epinephrine Brand or Generic: _____ Epinephrine Dose: <input type="checkbox"/> 0.15 mg IM <input type="checkbox"/> 0.3 mg IM Antihistamine Brand or Generic: _____ Antihistamine Dose: _____ Other (e.g., inhaler-bronchodilator if wheezing): _____ _____																									
PATIENT OR PARENT/GUARDIAN AUTHORIZATION SIGNATURE _____		DATE _____																							
PHYSICIAN/HCP AUTHORIZATION SIGNATURE _____		DATE _____																							
FORM PROVIDED COURTESY OF FOOD ALLERGY RESEARCH & EDUCATION (FARE) (FOODALLERGY.ORG) 4/2017																									

## Appendix E

## Steps for Epinephrine Auto-Injector

 <b>FARE</b> FOOD ALLERGY & ANAPHYLAXIS EMERGENCY CARE PLAN	
<p><b>HOW TO USE AUVI-Q® (EPINEPHRINE INJECTION, USP), KALEO</b></p> <ol style="list-style-type: none"> <li>1. Remove Auvi-Q from the outer case.</li> <li>2. Pull off red safety guard.</li> <li>3. Place black end of Auvi-Q against the middle of the outer thigh.</li> <li>4. <b>Press firmly</b>, and hold in place for 5 seconds.</li> <li>5. Call 911 and get emergency medical help right away.</li> </ol>	
<p><b>HOW TO USE EPIPEN® AND EPIPEN JR® (EPINEPHRINE) AUTO-INJECTOR, MYLAN</b></p> <ol style="list-style-type: none"> <li>1. Remove the EpiPen® or EpiPen Jr® Auto-Injector from the clear carrier tube.</li> <li>2. <b>Grasp the auto-injector in your fist with the orange tip (needle end) pointing downward.</b></li> <li>3. With your other hand, remove the blue safety release by pulling straight up.</li> <li>4. <b>Swing and push the auto-injector firmly into the middle of the outer thigh until it 'clicks'.</b></li> <li>5. <b>Hold firmly in place for 3 seconds (count slowly 1, 2, 3).</b></li> <li>6. Remove and massage the injection area for 10 seconds.</li> <li>7. Call 911 and get emergency medical help right away.</li> </ol>	
<p><b>HOW TO USE EPINEPHRINE INJECTION (AUTHORIZED GENERIC OF EPIPEN®), USP AUTO-INJECTOR, MYLAN</b></p> <ol style="list-style-type: none"> <li>1. Remove the epinephrine auto-injector from the clear carrier tube.</li> <li>2. <b>Grasp the auto-injector in your fist with the orange tip (needle end) pointing downward.</b></li> <li>3. With your other hand, remove the blue safety release by pulling straight up.</li> <li>4. <b>Swing and push the auto-injector firmly into the middle of the outer thigh until it 'clicks'.</b></li> <li>5. <b>Hold firmly in place for 3 seconds (count slowly 1, 2, 3).</b></li> <li>6. Remove and massage the injection area for 10 seconds.</li> <li>7. Call 911 and get emergency medical help right away.</li> </ol>	
<p><b>HOW TO USE IMPAX EPINEPHRINE INJECTION (AUTHORIZED GENERIC OF ADRENALCLICK®), USP AUTO-INJECTOR, IMPAX LABORATORIES</b></p> <ol style="list-style-type: none"> <li>1. Remove epinephrine auto-injector from its protective carrying case.</li> <li>2. Pull off both blue end caps: you will now see a red tip.</li> <li>3. <b>Grasp the auto-injector in your fist with the red tip pointing downward.</b></li> <li>4. Put the red tip against the middle of the outer thigh at a 90-degree angle, perpendicular to the thigh.</li> <li>5. <b>Press down hard and hold firmly against the thigh for approximately 10 seconds.</b></li> <li>6. Remove and massage the area for 10 seconds.</li> <li>7. Call 911 and get emergency medical help right away.</li> </ol>	
<p><b>ADMINISTRATION AND SAFETY INFORMATION FOR ALL AUTO-INJECTORS:</b></p> <ol style="list-style-type: none"> <li>1. <b>Do not put your thumb, fingers or hand over the tip of the auto-injector or inject into any body part other than mid-outer thigh.</b> In case of accidental injection, go immediately to the nearest emergency room.</li> <li>2. <b>If administering to a young child, hold their leg firmly in place before and during injection to prevent injuries.</b></li> <li>3. Epinephrine can be injected through clothing if needed.</li> <li>4. Call 911 immediately after injection.</li> </ol>	
<p><b>OTHER DIRECTIONS/INFORMATION</b> (may self-carry epinephrine, may self-administer epinephrine, etc.):</p>	
<p>Treat the person before calling emergency contacts. The first signs of a reaction can be mild, but symptoms can worsen quickly.</p>	
<p><b>EMERGENCY CONTACTS — CALL 911</b></p> <p>RESCUE SQUAD: _____</p> <p>DOCTOR: _____ PHONE: _____</p> <p>PARENT/GUARDIAN: _____ PHONE: _____</p>	<p><b>OTHER EMERGENCY CONTACTS</b></p> <p>NAME/RELATIONSHIP: _____</p> <p>PHONE: _____</p> <p>NAME/RELATIONSHIP: _____</p> <p>PHONE: _____</p>
<p>FORM PROVIDED COURTESY OF FOOD ALLERGY RESEARCH &amp; EDUCATION (FARE) (FOODALLERGY.ORG) 4/2017</p>	

## Appendix F

## Assessment of Knowledge: Food Allergies and Anaphylaxis



## Keeping Students Safe and Included

### FARE Education Network

# Quiz

1. A food allergy involves a potentially serious immune-based reaction to a food protein.  
 True    False    I don't know
2. Food allergies are basically the same thing as food intolerances.  
 True    False    I don't know
3. A delay in receiving epinephrine can be fatal.  
 True    False    I don't know
4. Students with a diagnosed food allergy should have an Emergency Care Plan (ECP).  
 True    False    I don't know
5. The severity of an allergic reaction can vary; a seemingly mild reaction can turn life-threatening within minutes.  
 True    False    I don't know
6. Stomach pain may be a symptom of an allergic reaction.  
 True    False    I don't know
7. Hives or skin redness will always occur in cases of anaphylaxis.  
 True    False    I don't know
8. After the first symptoms of an allergic reaction go away, a second wave of symptoms can start several hours later.  
 True    False    I don't know
9. Antihistamines should always be the first medication given when a student is having a food-allergic reaction.  
 True    False    I don't know
10. Epinephrine is a dangerous drug and administering it when you don't need it could hurt a child.  
 True    False    I don't know
11. You should administer a second dose of epinephrine if symptoms have not subsided in 5-10 minutes.  
 True    False    I don't know
12. Transport to an emergency room (ER) is not needed if a student has been given an injection of epinephrine and allergic symptoms have subsided.  
 True    False    I don't know
13. One in 10 children with food allergies report that they have been bullied, teased, taunted or harassed specifically because of their food allergy.  
 True    False    I don't know
14. Food allergies may constitute a disability under federal laws such as Section 504 of the Rehabilitation Act and the Americans with Disabilities Act (ADA).  
 True    False    I don't know
15. Every child at risk for anaphylaxis should have an individual written accommodation plan that should include both the accommodations and services needed for the child to be safely included in school activities, and the emergency care plan (ECP) that explains how to treat an allergic reaction.  
 True    False    I don't know
16. Hand sanitizers are not effective in removing food allergens.  
 True    False    I don't know
17. Home-baked goods are safe as long as the parent shows the teacher that the ingredient list is safe for students with food allergies.  
 True    False    I don't know
18. Packaged foods are safe as long as the allergens are not listed on the ingredient label.  
 True    False    I don't know
19. Schools should develop a school-wide or district-wide food allergy policy to ensure that their students with food allergies are kept both safe and included.  
 True    False    I don't know
20. Annual food allergy training and professional development should be implemented to ensure staff are familiar with policies, and are able to recognize and treat an allergic reaction  
 True    False    I don't know

The FARE Education Network and training materials are made possible by an unrestricted sponsorship from Mylan Specialty L.P.



## Appendix G

**Evaluation of Food Allergy Educational Training Program**

Read each statement and use the scale below.

	1= <i>Strongly Disagree</i>	2= <i>Disagree</i>	3= <i>Neutral</i>	4= <i>Agree</i>	5= <i>Strongly Agree</i>
	<i>Strongly Disagree</i>			<i>Strongly Agree</i>	
1. Instructor demonstrated knowledge about the topic.	1	2	3	4	5
2. The presentation was organized and presented in a logical manner.	1	2	3	4	5
3. The guidelines were clearly defined and explained.	1	2	3	4	5
4. I will be able to understand the signs of an allergic reaction.	1	2	3	4	5
5. I will feel empowered to react should a food allergy reaction occur.	1	2	3	4	5

**If disagree or strongly disagree was marked, please let comment below on how to improve it.**

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