

Nurse-Led Allergy Education for Non-Medical School Staff

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Article

Abstract

Food allergies can significantly impact school-age children and the teachers and staff who interact with children. A nurse educator used materials from the Food Allergy Research & Education ([FARE, 2019](#)) to provide an educational intervention at a parochial urban school to help school staff and administrators become better prepared to manage students with food allergies. Academic training on allergy knowledge, attitudes, and beliefs was provided to non-medical staff at the school. The educational intervention impacted participants' knowledge and understanding of food-related policy development. As food allergies continue to rise in school-age children, coupled with the decrease in school nurses, the need for this type of intervention will expand. A nurse educator-led food allergy intervention could ensure informed staff caring for school children with allergies.

Key Words: nurse educators, nurse-led interventions, food, food allergies, school, school-age children, school nurses

Over the past decades, there has been a significant increase in food allergies in the United States population ([Centers for Disease Control \[CDC\], 2016](#); [Gupta et al., 2020](#)). A specific characteristic of food allergies is that they are particularly prevalent in children and adolescents. Eighty-four percent of food-allergic children experience an allergic reaction in school ([Behrmann, 2010](#)). Approximately twenty-five percent of children with undiagnosed food allergies experience their first allergic reaction in school ([Murphy, 2014](#)). Effective food allergy management is always necessary in all situations. The pillars of food allergy management are prevention and emergency preparedness ([Pistiner et al., 2015](#)).

Guidelines have been published on preventative strategies for food allergen exposure and anaphylaxis. Behrmann (2010) notes that policies have been broken down into emergency action plans, templates for allergic students' medical information, and decreased risk of accidental ingestion. There is a need for guidelines to be in place for all those who work with children in a school setting because, as Pumphrey (2000) found when examining a series of 164 fatalities due to anaphylaxis, the median time interval between onset of symptoms and respiratory or cardiac arrest was 30 minutes in food-induced anaphylaxis. The proper assessment, prevention of exposure, and treatment are essential to save a life from accidental ingestion ([Bedolla-Barajas et al., 2014](#)).

In the past, prevention and response to food allergies have fallen upon school nurses. However, some limitations of the school nurse's response to anaphylaxis were present in the literature. Carlisle et al. (2010) noted there should be increased training requirements for registered nurses in response to anaphylaxis. Even with increased training, it was found that the school nurse's ability to prevent and respond was limited due to a ratio of one nurse to 650 students. Even with licensed personnel, a learning curve was present to respond appropriately ([Carlisle, 2010](#); [Pistiner, 2015](#)). Other researchers found that even when school nurses were trained and competent in preventing and treating food allergies, only 53.6% of schools had a full-time nurse ([Hogue et al., 2018](#); [Triggiani et al., 2008](#)).

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These factors undermine guidelines by the American Academy of Allergy Asthma and Immunology, which recommends that all schools have a solid administration and prevention plan for each child diagnosed with an allergy and the ability to respond to anaphylaxis appropriately ([LeBrovidence et al., 2015](#)). Further research has noted multiple deficiencies in response to emergent planning and response to an allergic reaction ([Carlisle et al., 2010](#)).

Evidence-based food allergy policy and implementation gaps were found within schools with unique food allergy needs populations ([Eldredge, 2014](#); [Sicherer & Sampson, 2018](#)). The allergy guidelines and policy were in place but lacked an emergency response plan. Most schools surveyed (90%) requested additional training, and 80% reported a registered nurse present only 10 hours weekly ([Eldredge et al., 2014](#)). These trends are concerning as children spend up to 50% of their waking hours attending school. There is a high risk of allergy exposure during school hours ([Carlisle et al., 2010](#)). Not all children at-risk for allergic reactions will have a registered nurse present during a reaction. Even then, Carlisle et al. ([2010](#)) found that self-reported proficiency among school nurses for critical areas of food allergy knowledge and management varied and found a weakness in staff education, delegation, developing guidelines for banning specific foods, and planning school trips. This is especially concerning as nurses are often absent on school and sports trips. Despite potential obstacles, the school environment can provide an opportunity to increase awareness, prevention, and treatment of food-allergic children outside the home ([Illinois Dept of Ed, 2010](#); [Sicherer & Sampson, 2018](#); [Wang et al., 2017](#)).

The opportunity to reinforce established training with the school personnel and staff will decrease anxiety, potentially reduce exposure, and improve response in an anaphylactic event.

Food allergy training is essential in schools with few or no school-based nurses, such as parochial schools. Many parochial schools do not employ full-time registered nurses. Thus, a trusted adult may or may not have extensive allergy training and policies related to allergy interventions. Guidelines exist to assist school administrators and personnel in developing local procedures to manage students with severe allergies. Benchmark training programs are available to help the public and private school systems ([Wang et al., 2017](#)). The Illinois Department of Education ([2010](#)) provides a detailed emergency action plan, but additional allergy awareness training is necessary

for parochial schools. A pilot allergy awareness and training program could enhance and support the allergy response policy. The opportunity to reinforce established training with the school personnel and staff will decrease anxiety, potentially reduce exposure, and improve response in an anaphylactic event. Focused training could also facilitate adherence to CDC guidelines to ensure all schools can administer, prevent, and respond to emergency allergy plans ([CDC, 2016](#)). This article describes the impact of a nurse-led allergy awareness and training program for non-medical personnel on increasing knowledge, attitudes, beliefs, and support for an allergy response policy at a parochial school.

Methods

This study occurred at an inner-city parochial school serving 672 students with 79 known allergies. The location did not have a full or part-time school nurse on site, and even if there was a food allergy, administrators or other adults responded to the child. Previous training or certification in food allergies was not required, and no specific person was designated as the primary responsible adult. The educational intervention was delivered by qualified nurse educators using materials from the Food Allergy Research & Education (FARE) "Keeping Students Safe and Included" program ([FARE, 2019](#)). FARE is a free, nationwide, and validated online training course designed to help school staff and administrators better manage students with food allergies and respond to anaphylaxis appropriately ([FARE, 2019](#)). FARE measures and assists schools in implementing the CDC's best practices for food allergies ([FARE, 2019](#)). This training course is encouraged and offered to the public and school systems upon inquiry.

Procedures

Due to the lack of a designated allergy-related person and school nurse on site, the educational interventions were made available and given to each faculty, staff, and volunteer adult who consented to participate in the study at the location. Participation was voluntary. Participating in the allergy education was free of charge and aligned with existing policies and programs (See [Appendix A](#)). The data retrieved from the surveys was encrypted and stored on a hard drive to which only the researchers had access. Due to the use of Survey Monkey, all responses recorded in the pre and post-test survey could be matched to each participant and remain anonymous to the researchers. The educational training for allergy knowledge, attitude, and beliefs was provided via one Zoom session (due to the Department of Public Health directives during COVID-19). The session was recorded and made available to individuals who could not attend the training. This study was approved by the Resurrection University IRB.

Survey Monkey was used to provide anonymity for online pre- and post-surveys. The participants had computer access at the parochial school if they did not have home access to complete the survey. In October 2020, before the intervention, a 35-question survey was sent via Survey

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Monkey to all faculty, staff, and volunteer adults at the location who consented to participate in the study (n=44). The survey included questions about knowledge (1-19), attitudes (20-30), and beliefs (31-35). The same survey was administered post-intervention to 44 participants in December 2020.

volunteer adult who consented to participate in the study at the location.

The pre- and post-survey results were analyzed using SPSS software. The analyses focused on the impact of the nurse-led educational anaphylaxis educational intervention on the non-medical personnel participants' overall knowledge, attitudes, and beliefs. After the intervention, the participants were expected to increase their knowledge level in each domain.

Results

A total of 44 participants consented to participate in the study and were sent the pre-intervention survey in October 2020. There was a 100% response rate with 44 responses, and no question was left blank. There was variation in the number of years taught. Half of the respondents taught K-4, with the remaining teaching 5-8 grades. Most participants (61%) had some previous training on allergy and allergy-related policies.

Most of the respondents in the pretest survey had a high general knowledge of food allergies. The overwhelming majority (95%) knew an allergy is when food harms the body. Eighty-four percent knew the difference between milk allergy and lactose intolerance. Ninety-seven percent knew someone could die from a food allergy. Everyone knew that someone could have an allergic reaction to just touching food. Just under 75% knew a person with a milk allergy could not have low-fat milk, and 88% knew food from mom could be passed via breast milk.

Respondents knew the top food allergies were peanuts, tree nuts, eggs, and milk but did not know about seafood. Respondents also stated that food allergies have increased (90%), there is no cure for food allergies (81%), and that food allergies do not go away with age (86%).

The respondents were less knowledgeable about specific beliefs concerning food allergies. About a quarter of respondents did not know if food allergies were hereditary, more common in children, if daily medication prevents an allergy, if staying away from allergic foods was difficult, or if children were treated differently or teased for having a food allergy.

The respondents did know specific policies and plans related to food allergies. The majority (81%) knew there were federal laws that required food labels, that those with food allergies should have epi-pens (79%), and that schools should have plans to address food allergies (77%). The policies to prevent exposure to potential food allergies were less supported as over half (65%) disagreed with banning nuts in schools, including not wanting to ban peanut butter sandwiches (43%). They did support having special tables that were nut, milk, and egg-free (85%).

The educational intervention also impacted participants' knowledge and policy despite the majority having some previous food allergy training. The difference was around knowledge about food allergies. The understanding of whether acidic food was a common allergy significantly changed ($p = .03$) from pre-not knowing (38%) and stating false (39%) to post-intervention, with only 3% not knowing and 60% stating false. Heritability was the second significant change ($p = .04$) in knowledge. Responses in the pretest had 24% not knowing, 46% stating true compared to the post-test stating true (53%).

Other significant changes were observed in responding to school policies and procedures regarding food allergies. The first significant finding ($p = .01$) regarded how to prevent food allergies with the policy that "people must stay away from the food that caused their allergies." The pretest had 18% not knowing and 27% stating false. After the intervention, there were no known facts, and fewer reported false (4%), with the majority supporting the avoidance of food policy (59%). The last significant change ($p = .03$) in terms of policy was whether schools should ban all nut products based on the potential of a child having a nut allergy. Once again, 6% strongly disagreed before the intervention, and 52% disagreed with this policy. Post-intervention, there was some change from the pretest strongly agreed (24%) to the post strongly agreed/agreed (60%).

Discussion

Food allergy awareness in schools remains a significant problem for students and those working there. This study found a significant impact on providing non-medical personnel with a nurse-led allergy awareness and training program. It increased knowledge and changed some attitudes, beliefs, policies, and support for allergy response policies. These changes enable what the CDC states in its best practices for volunteer school allergy practices: to ensure that schools can administer and respond to emergency allergy plans ([CDC, 2016](#)). Furthermore, these results help improve understanding of primary food allergies and develop school policies to respond to them appropriately. This could help address what Eldredge et al. (2014) found were gaps in evidence-based food allergy policies and implementation within schools with special needs populations.

The fact that the study participants were not nurses but adults working within the school setting also illustrates how this nurse-led educational intervention could be used within multiple school settings beyond the parochial system. This short, focused training for non-medical educators is needed as Eldredge et al. (2014) found that up to 80% of U.S. schools only had a registered nurse present 10 hours weekly.

The lack of a full-time or any registered nurse on-site with extensive food allergy training means that a non-medical person must know about allergies, policies, and policy compliance (Eldredge, et al. 2014; Wang et al., 2017), given a child's elevated risk of allergy exposure during school hours compared to home (Carlisle et al., 2010). This short educational intervention by a nurse educator illustrated it could increase non-medical staff competency in food allergy knowledge and policies that assist with managing those allergies in the school setting. As Carlisle et al. (2010) and Wang et al. (2017) have shown, there is a need for this type of non-medical staff training to develop guidelines for identifying, isolating, or banning specific foods outside the school setting for sports and educational trips (Sicherer & Sampson, 2018; Triggiani et al., 2008). The study results showed that the school environment could provide and support a one-time nurse-led educational intervention, which provided an opportunity to increase awareness, prevention, and treatment of food-allergic children outside the home in a school setting without a full or part-time school nurse on-site. Results should be interpreted with caution, given its limitations. The study was a one-time, single-site educational intervention with one post-test analysis of its impact. A more extended series of interventions with multiple post-test results may offer differing results. A multiple-site study might produce different results, especially if it included schools with more or fewer students with food allergies.

A nurse educator-led food allergy intervention could help to ensure that children with allergies in school settings are safer with more informed staff.

Conclusion

A food allergy educational intervention by a nurse educator increased knowledge and understanding and supported food allergy policies for non-medical school personnel. As the increase in food allergies continues to be seen in school-age children, coupled with the decrease in school nurses, the need for this type of nurse-led intervention will expand. A nurse educator-led food allergy intervention could help to ensure that children with allergies in school settings are safer with more informed staff.

Appendix A. Survey Tool

	<u>TRUE</u>	<u>FALSE</u>	<u>I DON'T KNOW</u>
1. An allergic reaction can happen when the body considers a food to be harmful.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Lactose intolerance (trouble digesting dairy products) is the same as having a milk allergy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. A person can die from having a food allergy reaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Hives (red bumps or blotches on the skin that can be itchy) are a <u>common</u> symptom of a food allergy reaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. People with food allergies can have an allergic reaction after touching a food.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. A person with a milk allergy can still drink low-fat milk without having an allergic reaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Foods eaten by a mother can be passed to her child through her breast milk.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Acidic foods (like lemons, oranges, and tomatoes) <u>commonly</u> cause food allergy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Allergic diseases run in families.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Food allergies can go away as a person gets older.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Food allergy is more common in children than adults.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. The number of children in the United States who have a food allergy has been increasing over the past ten years.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. There is a cure for food allergy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. The <u>only</u> way to prevent an allergic reaction is to stay away from the food that causes the allergy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. A person can take a medicine everyday to prevent having food allergy reactions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. There is a law in the United States that requires all foods to be labeled with allergy information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Which of the following are the three most common food allergies in children ? Mark <u>three</u> answers.	<input type="checkbox"/> Egg <input type="checkbox"/> Wheat <input type="checkbox"/> Milk	<input type="checkbox"/> Peanut <input type="checkbox"/> Tree nuts (<i>almonds, walnuts, pecans, cashews</i>) <input type="checkbox"/> Shellfish (<i>shrimp, lobster, crab</i>)	
18. Which of the following is the most common food allergy in adults ? Mark <u>one</u> answer.	<input type="checkbox"/> Milk <input type="checkbox"/> Peanut	<input type="checkbox"/> Shellfish (<i>shrimp, lobster, crab</i>) <input type="checkbox"/> I don't know	
19. A boy with a milk allergy accidentally drank some milk. Please mark which of the following could be a sign of food allergy reaction. Mark <u>all</u> that apply.	<input type="checkbox"/> After 2 days he gets hyperactive and cranky and has headaches <input type="checkbox"/> After 15 minutes he gets hives on his face and chest <input type="checkbox"/> Immediately his tongue swells and he has trouble breathing <input type="checkbox"/> He has a stuffy nose that won't go away for weeks		

Please mark one box for each statement below.

Strongly Disagree

Disagree

Neither Agree nor Disagree

Agree

Strongly Agree

MEASURE

20. Food allergy is a serious health problem in the United States.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. People with food allergies are treated differently because of their food allergy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Children with food allergies have overprotective parents.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Children with food allergies are teased at school.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. For someone who has a food allergy, staying away from the food that he or she is allergic to is difficult.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. People with food allergies worry a lot about their allergy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. It is difficult for people with food allergies to safely eat at restaurants.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Having an EpiPen or Twinject (injectable epinephrine) is important for most children with severe food allergies.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Schools should have plans for keeping children with food allergies safe at school.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Which of the following do you think is the most important to help people with food allergies? Mark <u>one</u> answer.	<input type="checkbox"/> Develop a cure for food allergy <input type="checkbox"/> Improve the treatments of food allergy <input type="checkbox"/> Find the causes of food allergy <input type="checkbox"/> Promote school education programs for food allergy <input type="checkbox"/> Promote public awareness campaigns for food allergy				
30. Which of the following would be the best way to learn about food allergy? Mark <u>one</u> answer.	<input type="checkbox"/> Radio <input type="checkbox"/> Television (TV) <input type="checkbox"/> Handout/Brochure <input type="checkbox"/> Internet/Email <input type="checkbox"/> Newspapers/Magazines <input type="checkbox"/> Other: _____				
	<u>Strongly Disagree</u>	<u>Disagree</u>	<u>Neither Agree nor Disagree</u>	<u>Agree</u>	<u>Strongly Agree</u>
31. Schools should ban all products with nuts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Schools should have special tables where children with food allergies can safely eat lunch.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. It would be unfair if my child could not have a peanut butter sandwich because of another student's peanut allergy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. I would worry about having a child with food allergy play at my house.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. What would be the best way for schools to teach parents about how to protect children with food allergies? Mark <u>one</u> answer.	<input type="checkbox"/> Handouts/brochures in the mail <input type="checkbox"/> Presentation at parent-teacher meetings <input type="checkbox"/> Parents of food-allergic children talking to other parents <input type="checkbox"/> Doctor or nurse talking about food allergies <input type="checkbox"/> Other: _____				

(Gupta et al., 2009)

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