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School nurse perspectives on school policies for food allergy and anaphylaxis

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ABSTRACT

Background: Although school health care professionals are integral to the management of students with food allergy, their views on school food allergy policies have not yet been reported.
Objective: To characterize food allergy policies currently being used in schools and their utility and potential barriers to implementation from the perspective of school health care professionals.
Methods: An electronic survey was disseminated to school nurses at the 2016 National Association of School Nurses meeting and through the Allergy and Asthma Network listserv. Frequencies were calculated to describe participant characteristics and responses. Unadjusted associations were examined using χ^2 tests; adjusted associations were examined using multiple logistic regression models.
Results: A total of 242 completed surveys were included in the analysis. Thirty-two percent of nurses reported an allergic reaction in their school in the past year. Most schools used a variety of policies, including anaphylaxis training for staff (96.7%), stock epinephrine availability (81.7%), designated lunch areas (62.2%), and food guidelines for classrooms (61.8%). Barriers to implementation included financial, time, and attitudinal considerations. Schools with pre-K or kindergarten students had higher odds of having designated lunch areas (adjusted odds ratio [OR], 2.1; 95% confidence interval [CI], 1.0–4.1; $P < .05$). The odds of having emergency epinephrine available were higher in schools with a full-time nurse (OR, 2.6; 95% CI, 1.1–6.3; $P < .05$) and in schools reporting at least 1 severe reaction in the past year (OR, 3.2; 95% CI, 1.2–8.5; $P < .05$).
Conclusion: With one-third of school nurses reporting an allergic reaction in the past year, schools use many strategies to minimize allergen exposures and increase anaphylaxis preparedness. Most school nurses favor these policies and acknowledge barriers to implementation.

Introduction

IgE-mediated food allergy affects up to 8% of children in the United States.[1] Up to 2 students in every classroom may be affected, and these students are at risk for allergic reactions, including anaphylaxis, during the school day.[2–5] In addition, up to 25% of students may experience their first allergic reaction while at school.[3,4,6] Thus, schools must be prepared to care for students with both known and unknown risk of food allergy.

The safety of students with food allergy while at school is a significant concern among families and school staff. Meals, including breakfast, lunch, and snacks, are a regular part of the school day. Food may also be used as a part of classroom lesson plans, celebrations, and rewards and in school-wide activities, such as fundraisers, bake sales, and concession stands at athletic events. Additional food allergens may be found in common nonfood products, including craft and science materials.[3] Given the variety of ways in which food may be used during the school day, schools can represent high-risk settings for inadvertent exposures.

To promote a safe learning environment for students, schools develop and implement policies to prevent unintentional allergen exposures and respond to any reactions that may occur. Although few evidence-based resources such as the *CDC Voluntary Guidelines for Managing Food Allergies in Schools and Early Care and*

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Education Programs and the online toolkit from the National Association of School Nurses (NASN) are available to assist schools with development of food allergy policies and staff education,[7,8] no standardized food allergy protocols currently exist for schools. Therefore, wide variability in food allergy policies may be seen nationwide.

School nurses are leaders in the development, implementation, and evaluation of school health-related policies[9] and often work with students' health care practitioners to promote student health and safety while at school. Although school nurses play an integral role in school food allergy management, little is known about their perspectives on school food allergy policies. The goal of this study was to describe the policies currently used by schools and to characterize the perceptions of school nurses regarding the effectiveness, need, and barriers to implementation of these policies.

Methods

Survey Development and Dissemination

An initial survey was developed by pediatricians, allergists, survey researchers, and school nurses with the goal of characterizing school policies related to food allergy. The survey domains included school characteristics (size, grade levels, nursing staff); current food allergy policies; acceptability, effectiveness, and feasibility of current policies; and desired food allergy policies. After initial survey development, cognitive interviews were conducted with a subset of school nurses and administrators (n = 5) to refine the survey questions. The final survey tool consisted of 125 multiple-part, multiple-choice, and open-ended response questions with skip logic and required approximately 15 minutes to complete. The final survey was administered electronically. REDCap (Research Electronic Data Capture,[10] Vanderbilt University) was used to administer the online survey, which was hosted at Northwestern University.

Selection of Participants

School nurses and administrators were recruited for participation through the 2016 NASN meeting and the Allergy and Asthma Network listserv. Eligible participants were invited to participate via an e-mail that contained a link to the survey, and consent was implied if they completed the survey through this link. The process of obtaining informed consent followed all applicable requirements. The survey was conducted from June 2016 through October 2016. No identifying information was collected, and all responses were kept confidential on secure servers at Northwestern University. The study was deemed exempt by Northwestern University's Institutional Review Board.

Statistical Analysis

All statistical analyses were performed in Stata 14.0 statistical software (Stata Corp, College Station, Texas). Frequencies were calculated to describe respondent characteristics and responses. To examine the association between report of a particular practice and respondent characteristics, outcomes were dichotomized into 2 categories: yes and no/don't know. Missing responses were coded with no/don't know. Unadjusted associations were examined using χ^2 tests; adjusted associations were examined using multiple logistic regression models that were estimated for each outcome.

Results

Survey Respondents

Of 307 completed surveys, 242 were included in the final analysis. Sixty-five were excluded because of missing data or responses having been provided for a larger system (eg, district instead of school). Most respondents were school nurses (95.9%), worked at a public school (88%), and worked at an elementary and/or middle school (90.9%) (Table 1). School size was most frequently between 500 and 999 students (45.9%). All regions of the United States were represented, with the highest percentage being from the Northeast (33.9%) and Midwest (33.2%). A nurse was reported to be on site 5 days a week in 88% of schools.

Table 1
Demographic Characteristics of Survey Respondents and the Schools They Represent

Characteristic	Finding[a] (N = 242)
Respondent type	
Nurse	232 (95.9)
Administrative staff	3 (1.2)
Other	7 (2.9)
Mean (SD) No. of days a nurse is available at school	4.6 (1.10) (n = 233)
Type of school	
Public	213 (88.0)
Private and other	29 (12.0)
Grades included (not mutually exclusive)	
Any Pre-K or Kindergarten	183 (75.6)
Any elementary (fifth grade or less)	197 (81.4)
Any elementary or middle (less than ninth grade)	220 (90.9)
Region	
Northeast	82 (33.9)
Midwest	80 (33.1)
South	59 (24.4)
West	21 (8.7)
Student population	
0–499	88 (36.4)
500–999	111 (45.9)
1,000–1,999	29 (12.0)
2,000–4,000	14 (5.8)
No. of students with a food allergy reported (n = 234)	
0–14	64 (37.4)
15–29	80 (34.2)
30–44	38 (16.2)
≥45	52 (22.2)
Mean No. of severe allergic reactions to have occurred in the past year reported	
0	165 (68.2)
1	51 (21.1)
>1	26 (10.7)
Common allergens reported:	
Peanut	228 (94.2)
Tree nut	200 (82.6)
Milk	94 (38.8)
Egg	91 (37.6)
Shellfish	81 (33.5)
Fin fish	17 (7.0)
Wheat	49 (20.3)
Soy	28 (11.6)
Other	21 (8.7)

[a]Data are presented as number (percentage) unless otherwise indicated.

All except 2 respondents reported at least 1 student with known food allergy in their school. Peanut was the most frequently reported allergen (94.2%). A total of 31.8% of respondents indicated that at least one severe allergic reaction occurred at their school in the previous academic year, with 34% of these reporting more than one severe reaction.

Food Allergy and Anaphylaxis Policies

Most schools used a variety of policies to mitigate the risk of food allergen exposure, including policies for allergen containment and policies to increase preparedness to manage an allergic reaction (Table 2). The polices most frequently reported to be in place were training of school staff on allergic reactions and anaphylaxis (96.7%) and the use of an epinephrine autoinjector (EAI) (96.7%), training of lunchroom staff about food allergies (88.4%), clear cleaning procedures for the lunchroom (84.3%), availability of emergency (stock)