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Evidence Based Practice

Research to Practice: Developing an Integrated Anaphylaxis Education Curriculum for School Nurses

Rebecca Cavanaugh, MN, RN, NCSN, and C. June Strickland, PhD, RN

The numbers of school-aged children with life-threatening allergies that cause anaphylaxis continues to increase. Many states, including Washington, have responded to this by developing specific guidelines for school districts to follow in order to provide a safe learning environment for children with medical conditions that put them at risk for anaphylaxis. School nurses require resources to assist them in providing health training for school staff on how to manage potentially life-threatening health conditions for children in their school, however, resources to address this training are limited. A search for and content analysis of currently available literature and resources about anaphylaxis and anaphylaxis training curricula revealed a lack of an integrated curriculum to train school staff. This article presents a discussion of the development of a train-the-trainer anaphylaxis education program providing school nurses with curriculum, lesson plans, teaching-learning activities, and resources for anaphylaxis education of all school staff.

Keywords: allergies; anaphylaxis; education; integrated curriculum; school nurses to train school staff

INTRODUCTION

The incidence of anaphylaxis is growing in the community (Simons, 2007). The top eight most common food allergies, where food allergens constitute as the most common inducer of anaphylaxis in school are milk, eggs, peanuts, tree nuts (such as pecans and walnuts), shellfish, fish, wheat, and soy (Food Allergy and Anaphylaxis Network [FAAN], 2008); although an individual can have an allergy to any food. The American Academy of Allergy, Asthma and Immunology (AAAAI, 1998) estimates that 1–2% of the general population is at risk for anaphylaxis from food allergies and insect stings; there is a lower reported prevalence for drugs and latex allergies.

Increasing numbers of school-aged children have severe allergies that cause an anaphylactic response

in the body and require emergency care to prevent death (Lieberman et al., 2005; Murphy et al., 2006; Sicherer & Simons, 2005). Children many times experience their first allergic reaction in school (Selekman, 2005). Schools are required to provide a safe learning environment for all children and many states have developed new guidelines for care of students with life-threatening allergies. Within these guidelines (Arizona Department of Health Services, 2007; Connecticut State Department

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of Education, 2006; Massachusetts Department of Education, 2002; New Jersey Department of Education, 2008; New York State Department of Health, Education Department, & Statewide School Health Services Center, 2008; Tennessee Department of Education & Tennessee Department of Health, 2007; Washington State Office of the Superintendent of Public Instruction [OSPI] Guidelines for Care of Students with Life-Threatening Food Allergies, 2008) are general information about allergies, anaphylaxis, and information about the specific types of allergies that can cause anaphylaxis, and the roles and responsibilities of students, parents, school administrators, school nurse, teachers, dietary, custodial, and transportation staff. There are also guidelines for each area of activity during the school day including school-sponsored activities that occur outside of the school day. In order to provide a safe school environment, school nurses must collaborate with school administrators to provide training for school personnel according to the state government guidelines.

In 2008, legislation was passed in Washington State that directed "the office of the superintendent of public instruction, in consultation with the department of health, shall develop anaphylactic policy guidelines for school, to prevent anaphylaxis and deal with medical emergencies resulting from it" (Anaphylaxis—policy guidelines—procedures—reports. Revised Code Washington RCW 28A.210.380, 2008). One component of the guidelines is to include the "content of a training course for appropriate school personnel for preventing and responding to a student who may be experiencing anaphylaxis" (Revised Code Washington 28A.210.380 (b), 2008).

It has been established that the components of anaphylaxis training should include the use of individual emergency action plans for students, prevention of exposure to allergens, and implementation of anaphylaxis guidelines in the event a child experiences an exposure to an allergen. The implementation includes training and delegation of duties in the care of children with severe allergies including administering epinephrine (AAAAI, 2008; FAAN, 2001). While resources are available, no curricula or specific lesson plans are available to guide a school nurse in training staff for their responsibilities.

A curriculum to train all school staff about anaphylaxis needed to be developed for use by school

nurses in Washington State. It was recognized that such a curriculum would serve the needs of Washington State and also serve as a model for other states. The purpose of this article is to present the existing anaphylaxis resources that led to the design and development of a train-the-trainer anaphylaxis education program. This anaphylaxis education program provides Washington State school nurses with curriculum, lesson plans, teaching-learning activities, and resources to provide anaphylaxis education for school staff.

"The purpose of this article is to present the existing anaphylaxis resources that led to the design and development of a train-the-trainer anaphylaxis education program."

BACKGROUND

School districts across the country have experienced additional legislation over the past 8 years aimed at providing school health services to children with illnesses and diseases that impact their daily life. Many states now have laws and regulations in place for students coming to school with life-threatening illnesses, diabetes, asthma, and severe allergies and anaphylaxis (Arizona Department of Health Services, 2007; Connecticut State Department of Education, 2006; Massachusetts Department of Education, 2002; New Jersey Department of Education, 2008; New York State Department of Health, Education Department, & Statewide School Health Services Center, 2008; Tennessee Department of Education & Tennessee Department of Health, 2007; OSPI, 2005, 2008a; OSPI Guidelines for Care of Students with Life-Threatening Food Allergies, 2008). These laws and regulations include requirements that school staff receive training to enable them to implement the guidelines to care for students with potentially life-threatening health conditions. The school nurse is recognized as the district expert in health information and is responsible for the training of unlicensed assistive personnel, teachers, and school staff in the health issues that affect the school-age child. Since the school nurse's caseload can include multiple schools, unlicensed assistive personnel and teachers are administering

medication and caring for ill and injured children during the school day in the absence of the school nurse (Telljohann, Price, Dake, & Durgin, 2004).

School nurses require resources to assist them in providing health training for school staff on how to manage potentially life-threatening health conditions for children in their school, but resources to address this training are limited. Behrmann (2010) identified gaps in the implementation of guidelines for food allergic students in schools and child care facilities. He notes specifically the need to "eliminate gaps in emergency preparedness and allergen avoidance policies" (Behrmann, 2010, p. 187). The author identifies the role of the school nurse to collaborate with administrators using ethical principles in order to address these gaps. Literature and Internet resources provide the general overview of information that should be included in anaphylaxis education for school staff, but more specific curricula are needed (Forster & Bryant, 2004; Murphy et al., 2006; Simons, 2007). It was recognized that an integrated toolkit was needed to provide school nurses with uniform training guidelines and materials in order to undertake the task of preparing all school staff to address anaphylaxis.

LITERATURE REVIEW

There has been increasing literature since the 1990s about food allergies and anaphylaxis as physicians and researchers work together to clarify the definition of anaphylaxis and the clinical criteria for diagnosing anaphylaxis. The current clinical definition of anaphylaxis is "a serious allergic reaction that is rapid in onset and may cause death" (Sampson et al., 2005). The AAAAI (1998) position statement notes that "all individuals entrusted with the care of children need to have familiarity with basic first-aid and resuscitative techniques. This should include additional formal training on how to use epinephrine devices."

The literature is rich with articles describing the information to include in training programs. There is a lack of resources that offer specific tools to engage school staff in the learning process of anaphylaxis awareness, prevention, and the recognition of anaphylaxis symptoms and the implementation of an emergency action plan for a student experiencing an anaphylactic reaction.

Vicker, Maynard, and Ewan (1997) describe a training package for school staff that includes general didactic information including the components of an emergency action plan, though they identify that the background work for their training sessions is time consuming. The training sessions are designed as student-specific training and the time to prepare materials includes the development of an emergency action plan with the student, parent, healthcare provider, and the school nurse.

A study done by Weiss, Muñoz-Furlong, Furlong, and Arbit (2004) looked at the impact of food allergies on school nurse practice in elementary schools. In this study, staff training was identified as a management strategy for avoiding food allergy reactions and 78% of the 400 school nurses who responded used this strategy. Nearly three quarters of those reported using guidelines for training developed by their school; 58% used guidelines developed by their school district or school board; 47% indicated that the parents of students with food allergies conduct the trainings; 43% use training guidelines developed at the state level (i.e., Department of Education and Department of Health); and almost 32% used guidelines developed by an outside organization (Weiss et al., 2004, p. 5, 6). The authors note these results suggest a potential lack of consistency in the training of school personnel about food allergies.

There are many organizations with websites that contain information and resources about allergies and anaphylaxis for the general public and schools (i.e., AAAAI, FAAN, Allergy in Schools [UK], Asthma and Allergy Foundation of America, Allergy Safe Communities—Canadian Society of Allergy and Clinical Immunology, National Association of School Nurses, American School Health Association, School Nurse News, and <http://safe@schoolpartners/foodallergysmart.org>). In reviewing these Internet resources, it was noted that the components of anaphylaxis school plans like those listed in state school guidelines were included, but there was no inclusion of training curriculum or there was no public access provided to the anaphylaxis training curriculum for the education of employees.

In 2004, the FAAN published the School Allergy Training Program (2001) and distributed it for free to all states through a grant. The FAAN website offers a Food Allergy and Anaphylaxis

Comprehending the basic medical facts.
Avoiding the Allergen.
Recognizing a Reaction.
Enacting Emergency Action Plan!

safe@schoolpartners/foodallergysmart.org
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Figure 1.

Fact Sheet for Emergency Responders that can be downloaded and used as a handout for school staff as part of an awareness training program.

In 2002, AAAAI offered a School Nurse Toolkit for managing allergies and anaphylaxis in schools (Selekman, 2005). This toolkit is no longer available "because ... a portion of the medical information became out of date" (A. Rodman, AAAAI, personal communication, October 7, 2008). Amanda Rodman advised that it had been recently decided to restructure and update the toolkit and rerelease within 2009.

Safe@School®Partners has a recommended school training entitled *How to CARE™ for Kids with Food Allergies* (2006). This one page curriculum provides the acronym of CARE and the key points to address each area (Figure 1).

New York's Statewide School Health Services Center provides a PowerPoint® presentation: "Faculty Overview of Managing Allergies and Anaphylaxis in Schools," which includes the information in the "Caring for Students with Life-Threatening Allergies developed by New York State Department of Health, New York State Education Department, and New York Statewide School Health Services Center."

Prevention First (2008), an online teaching resource in Ontario, Canada is a website developed "to assist school boards, principal, teachers, staff and others who play an important role in helping to create safer environments for pupils with anaphylaxis." (<http://www.eworkshop.on.ca/edu/anaphylaxis/index.cfm>). This website contains vital information on how to develop strategies to help reduce the risk of exposure to triggers of anaphylaxis and how to respond in the event of an emergency.

Weiss et al. (2004) suggests that school nurses are charged with the responsibility to "reinvent

the wheel" in developing staff education and training programs for food allergy management. They suggest that there is a need for state and/or national guidelines and training program development. On April 8, 2008, the US House of Representatives passed the Food Allergy and Anaphylaxis Management Act (2008). This act directs the creation of a uniform document to provide schools with guidance in the care and management of students with food allergies.

In Washington State, *Guidelines for Care of Students with Life-Threatening Allergies* (2008) was disseminated to school districts March 19, 2008, by the OSPI. These guidelines direct school districts to provide training for all school staff in awareness of food allergies and anaphylaxis and suggest the use of OSPI's Food Allergy Kit that was prepared by the OSPI Child Nutrition Services. This kit is available through a School Nurse Corps supervisor at each of the state's educational service districts (Figure 2). The guidelines include a sample training program aimed at school staff who will have responsibility for implementing a student's emergency care plan. The sample training program includes learner objectives, methods of delivery and time frame, and instructional media from the Food Allergy Training Kit. This curriculum is primarily composed of self-study by the individual learner, with a preassessment and postassessment meeting with the learner and the school nurse trainer. The training program includes a Likert scale preassessment tool, a post-assessment multiple choice test, and a Likert scale course evaluation tool.

"This curriculum is primarily composed of self-study by the individual learner, with a preassessment and postassessment meeting with the learner and the school nurse trainer."

From this literature review, it was determined that while many programs and resources exist, an integrated curriculum and lesson plans that a school nurse might use to implement staff training was not available for free access. To address the needs for Washington State, such an effort was deemed important to meet the legislative directives. The goal of this effort was to develop a training program that school nurses can use to prepare

Washington State Office of the Superintendent of Public Instruction Food Allergy Kit:

Epipen® Jr. Trainer This is a duplicate of the actual Epipen® Jr. used to treat food allergy reactions and anaphylaxis. It does not contain a needle or epinephrine, and can be reset and used repeatedly for instruction and demonstration.

Videos

1. It Only Takes One Bite: Food Allergy and Anaphylaxis Video
2. Alexander, The Elephant Who Couldn't Eat Peanuts Video

Books

1. Getting Started with Food Allergies: A Guide for Parents
2. Just One Little Bite Can Hurt! Important Facts About Anaphylaxis
3. Off to School with Food Allergies, Parent/Teacher Set
4. Students With Food Allergies: What Do the Laws Say?
5. Nutrition Guide to Food Allergies
6. A Special Day at School
7. Andrew and Maya Learn About Food Allergies
8. Food Allergy Network Ordering Brochure
9. Miss Roben's Catalog

Printed References

This is a collection of physician's orders, articles, resources, and Web sites from various sources including newspapers, magazines, and the World Wide Web. The Emergency Allergy Treatment Plan (IHP/ECP) is written by the student's LHCP and updated yearly. It is the actual treatment orders to be given to personnel such as emergency medical technicians or emergency room staff. A copy of the IHP/ECP is also kept with the medical kit, which contains the Epipen® Jr. and Benadryl®.

Guidelines for Care of Students with Food Allergies (2008)

Figure 2.

all school district staff in the *Guidelines for Care of Students with Anaphylaxis* (OSPI, 2009) and their responsibilities and to develop a procedure for school nurses to implement the training program. This discussion illustrates the process and offers a much needed integrated approach to ensuring the implementation of the *Guidelines for Care of Students with Anaphylaxis* (OSPI, 2009) for all school staff.

METHOD

To design an education program, it is important to determine what has been done and materials that have been found to be appropriate; it is also important to determine, what experts think should be included in the curriculum, the most appropriate approach for instruction and what those who will be the recipients of the education want to know. In this work, an extensive literature review was undertaken from July 2008 through February 2009. After which from February 2009 to May 2009 school nurses in Washington State

and the OSPI were engaged in reviewing and providing feedback about the content, teaching approaches, and implementation.

In order to develop an anaphylaxis training resource that school nurses can use to train school staff, a search of the bookshelf resources in the Health Services Program at the OSPI and e-mail communication with School Nurse Corps supervisors and other key school nurse leaders in Washington State was conducted for copies of the School Allergy Training Program published by FAAN and the School Nurse Toolkit for managing allergies and anaphylaxis in schools offered in 2002 by AAAAI. A content analysis of the bookshelf resources focused on the inclusion of educational materials including lesson plans and teaching strategies.

Adult learning theory (Knowles, 1984) was the theoretical orientation for the curriculum design in this work. The adult learning theory of andragogy (Knowles, 1984) is defined as "the art and science of helping adults learn" (p. 6). In this framework Knowles (1984) describes the learner

as self-directed, the learner's experiences provide a resource for future learning, the learner's readiness to learn can be developed from life tasks and problems, the learning is oriented to the learner's life tasks or problems that need to be solved, and the learning is internally motivated by the learner toward self-actualization (Maslow, 1970). The role of the educator within this framework is as facilitator of the learning process.

Adult learners are motivated to learn by external influences especially related to employment expectations (Knowles, Holton, & Swanson, 2005). The adult learner is a potential adopter of new information (innovation) and the diffusion of this "occurs through a combination of (a) the need for individuals to reduce personally uncertainty when presented with new information, (b) the need for individuals to respond to their perceptions of what specific credible others are thinking and doing, and (c) general felt social pressure to do as others have done" (Dearing, 2008, p. 100).

The teaching strategies that will engage the adult learner in self-directed learning is to use problem-based learning (PBL). PBL uses real-life scenarios where students work in small groups to identify problems, compare and evaluate solutions, and decide how to handle the actual or hypothetical situation (Distler, 2007; Ozturk, Muslu, & Dicle, 2007; Tomey, 2003; Worrell & Profetto-McGrath, 2007). Diversity of audience, differing learning styles, and learner motivation will be addressed. The objectives of the curriculum have been guided by the *Guidelines for Care of Students with Life-Threatening Allergies* (2008) and the *Guidelines for Care of Students with Anaphylaxis* (OSPI, 2009). The curriculum was reviewed by the OSPI Health Services Program Assistant, key school nurse leaders, school nurses, and nurse educators for accuracy of content and ease of use in educating school staff.

RESULTS

In this effort, a train-the-trainer education program to prepare school nurses to educate staff about anaphylaxis was designed, as well as the curriculum for the training of staff. The results presented here focuses on the content analysis of the OSPI resources and on the curriculum that was designed for nurses to teach staff, not the training that was designed for them as teachers about this

curriculum. A literature review was conducted and Washington State nurses were engaged in reviewing and providing feedback about the content, teaching approaches, and implementation.

Upon investigation of the OSPI bookshelf resources the Health Services Specialist provided the contents of the OSPI's anaphylaxis resources that included copies of the following:

- The School Food Allergy Program published by FAAN (1995/2001).
- FAAN videos "Action Plan for Nurses-Keeping Our Kids Safe" (1995/1999) and "It Only Takes One Bite" (1993).
- Food Allergy and Anaphylaxis—A Training Program for Unlicensed Personnel by California School Nurse Organization Bay Coast Section (Bevins-Johnson & Vanderidder-Kremer, 2002) compact disk.
- Food Allergy and Anaphylaxis—A Training Program, a training presentation for nurses by California School Nurse Organization Bay Coast Section (Bevins-Johnson & Vanderidder-Kremer, 2003) compact disk.
- New York Statewide School Health Services Power Tools: Making the difference—School Nurses Impact Student Achievement! (2008) compact disk.
- School Health Services Programs: Missouri Department of Health and Senior Services (2006) compact disk.

The AAAAI's School Nurse Toolkit (2002) was not available in the OSPI resources and the Health Services Specialist was not aware of any School Nurse Corp supervisors who had a copy in their office. E-mail communication was received from the School Nurse Specialist in Spokane Valley and President of the School Nurse Organization of Washington (SNOW, 2008–2010) that she did not have a copy of this toolkit and was not aware of its use by other school nurses in SNOW. In discussions with other school nurse colleagues, it became apparent that among many school nurses there was no knowledge of this toolkit. The content of the OSPI's anaphylaxis resources did not include teaching strategies or lesson plans. Each resource is aimed at educating school staff in food allergies and anaphylaxis response to allergens. The resources from California School Nurse Organization, New York Statewide School Health Services, and Missouri Department of Health and Senior Services had not previously been made available for use by school nurses in Washington State. The School Food Allergy Program (FAAN, 1995/2001) includes a notebook with written materials and a video "Action Plan for

Nurses-Keeping our Children Safe" (1995/1999). The content of this program has become the framework for food allergy and anaphylaxis guidelines developed in the United States and for all other resources and materials found at the OSPI and in the literature review previously discussed.

The written materials include an overview of the stakeholders and research that led to the development of the program, what a food allergy is and how the body reacts to a food allergen, the causes of food allergies, the signs and symptoms, and treatment for a food allergy reaction. Anaphylaxis is defined, the symptoms are identified and the treatment with an epinephrine autoinjector is discussed. There is a section that describes the mechanism of giving the epinephrine autoinjector using the brand Epipen®. The program includes guidelines for schools to develop policies and procedures including the development of emergency action plans for students with life-threatening food allergies and how to read and follow the plan.

"The program includes guidelines for schools to develop policies and procedures including the development of emergency action plans for students with life-threatening food allergies and how to read and follow the plan."

The video "Action Plan for Nurses-Keeping our Children Safe" (FAAN, 1995/1999) chronicles one school nurse's development of procedures in the care of students with life-threatening food allergies. These procedures followed the recommendations included in the written materials of The School Food Allergy Program (FAAN, 1995/2001) and demonstrated an anaphylaxis drill carried out by school staff beginning in the classroom of a student with a life-threatening food allergy.

Bevin-Johnson and Vanderidder-Kremer (2002, 2003) are California school nurses who developed PowerPoint® presentations for use in training school nurses and unlicensed assistive personnel in food allergies and anaphylaxis. These PowerPoint® presentations do not include any accompanying training notes. Neither of these presentations is available to the public and no results were found in a search on the California School Nurse Organization website (<http://www.csno.org/>) for these resources.

Both presentations include awareness of food allergy information and avoidance strategies within the classroom, and identify the areas where collaboration and planning are needed for student safety. The nurse training presentation adds slides with specific avoidance strategies listed, the responsibilities of schools, school nurse, parents, and students with a food allergy.

Both of the presentations include anaphylaxis definitions, signs and symptoms, directions for administering epinephrine autoinjector, and instructions activating Emergency Medical Services, for care of the student, communication with parents and school staff, documentation, and disposal of the epinephrine autoinjector. The nurse training presentation has more in-depth information about anaphylaxis, causes, listing of specific school nurse responsibilities for preparation for a student with a life-threatening allergy. There are slides that include federal and state laws that affect students with life-threatening allergies, and the findings of two research articles about use of epinephrine autoinjectors.

The New York Statewide School Health Services Power Tools (2008): *Making the difference—School Nurses Impact Student Achievement!* is a complete set of resources for the school nurse practicing in New York state. There are nine folders with resources and information on health topics that affect school children. The "Food Allergies" folder contains 38 resources in PDF form. There is information from websites and publications about food allergies and anaphylaxis for school nurses to use in their practice. Included is a PowerPoint® presentation "Allergic Reactions in the Schools" developed by Sally Schoessler (2005). This presentation does not directly identify the audience intended to receive the information as in Bevin-Johnson and Vanderidder-Kremer (2002, 2003), however, some of the information leads one to the conclusion that it is a simplified overview for school nurses. The presentation includes basic information on bee sting allergy and peanut and nut allergy causes and avoidance management strategies, localized and generalized symptoms of exposure to an allergen, preparation steps in order to provide emergency care and allergy management at school, and a brief discussion of student health confidentiality. Training notes are not included in the presentation. Prior online searches of The New York Statewide School Health Services

website (<http://www.schoolhealthservicesny.com/>) did not result in finding the information included in this compact disk resource.

The Missouri Department of Health and Senior Services (2006) School Health Services Programs included folders with state guidelines pertaining to communicable diseases, growth screening, hearing screenings, medication administration, school health advisory council, school health, scoliosis screening, and vision screening. Anaphylaxis and food allergy information is not included in this resource.

During the review of the above resources, the websites of AAAAI and FAAN were searched for any updated information. As noted previously, AAAAI planned to post a new toolkit for school nurses in 2009 and School Tools: Allergy & Asthma Resources for Professionals (AAAAI, 2009) was retrieved February 19, 2009. This toolkit contains three documents:

1. What You Should Know About Food Allergy—this page provides information about strategies school staff and parents can use to work toward providing a safe school environment for children with food allergies. There is a list of common foods that are known to cause an allergic reaction and a listing of life-threatening respiratory and cardiovascular symptoms of an allergic reaction. The last section provides four points in the treatment of a food allergy.
2. What You Should Know About Anaphylaxis—this page begins with a definition of anaphylaxis, lists common causes of anaphylaxis, and lists the signs and symptoms of anaphylaxis by body system.
3. Treatment of Anaphylaxis Preparedness and Prevention—the prevention paragraph focuses on school staff awareness of specific students with a history of anaphylaxis to a food allergen, provision for an allergen-free environment at mealtime, and a written response plan to be initiated in the event of a reaction. The preparedness section includes discussion of medications used to treat anaphylaxis, allergies, and asthma and storage of medications, recognition of symptoms, and procedure for responding to an anaphylactic reaction.

All of the resources analyzed include some or all of the recommended information as noted throughout the literature review.

Curriculum Description

Using the Anaphylaxis Policy Guidelines (RCW 28A.210.380), information from the literature review, participation in the development of

OSPI's *Guidelines for Care of Students with Anaphylaxis* (2009), and the content analysis of the findings listed above, the anaphylaxis curriculum was developed. The curriculum was divided into the following sections: (a) awareness, (b) avoidance, (c) recognition, and (d) response to anaphylaxis. The awareness section includes the definition of anaphylaxis and the causes of anaphylaxis. The avoidance section includes prevention measures the school staff needs to take for each cause of anaphylaxis. In this section, we included a review of the roles and responsibilities of school staff and the laws that protect students with life-threatening health conditions. In the recognition section, we included a brief discussion of the pathophysiology of the body's reaction to an allergen and the signs and symptoms of an anaphylactic reaction by affected body system. The response section included the parts of an emergency action plan, discussion of epinephrine as the treatment for anaphylaxis, and the AAAAI's (2009) recommendations regarding use of antihistamines and bronchodilators. Administration of epinephrine using the brand Epipen® is included. The response section allows for a discussion of each school districts emergency action plan and communication plan for school staff to follow when responding to a student with anaphylaxis or other life-threatening health concern. The curriculum concludes with a list of resources for further information and a case study activity where school staff are divided into groups to practice recognizing and responding to a student with an anaphylactic emergency.

The case study activity included in the curriculum utilizes PBL methods of small group discussion and activities that meet the multiple learning styles of active discussion, sharing attitudes, feelings and values, listening to others perspectives, printed materials, and role playing. These activities address the affective, cognitive, and psychomotor learning domains and improve critical thinking self-confidence (Colucciello, 1999). Colucciello (1999) notes the attributes of critical thinking self-confidence is "taking pride in the ability to think with precision, having a reputation for diligence, and being admired for intellectual curiosity and inquisitiveness" (p. 300). Learning experiences in small group work contributes to the learner's development of critical thinking self-confidence. School staff who develop this critical thinking self-confidence about anaphylaxis will feel

confident in fulfilling their responsibilities of providing a safe learning environment and implementing an emergency action plan for a student with a life-threatening allergy. The use of the case study method in the teaching-learning process activates learning through emotional, procedural, and review rehearsal and memory pathways. The use of real-life scenarios within the school day activates the emotional response center of the brain in the amygdala, the use of role play activates muscle memory, and review reinforces the memory to avoid loss of the learning (Altman, 2008).

Evaluation of student learning is accomplished through the introduction of the learning activities, moving about the small groups of learners encouraging the process of learning with each group as needed, and offering feedback to reinforce the learning activity. Providing feedback during teaching-learning process begins the assessment and evaluation of the learners. The observation of students practicing giving themselves and others an Epipen® offers the opportunity to evaluate this competency. Evaluation was designed to occur during the learning process as students participate in the assigned activities and subsequent presentation of their results. In this way students are able to understand, apply, analyze, synthesize, and evaluate their own learning and the educator is able to evaluate and give feedback.

The *Guidelines for Care of Students with Anaphylaxis* (OSPI, 2009) includes an updated student-specific sample training program. The postassessment multiple-choice test can be used for a formal documentation of learning by school staff as it meets the learner objectives of the new anaphylaxis curriculum. The sample training program Likert scale course evaluation tool can be adapted to evaluate each individual school training course. Use of these final evaluations will identify areas of change needed in the teaching-learning process to effectively meet the needs of the learner.

Curriculum Objectives

At the completion of the curriculum presentation school staff will be able to:

1. Define anaphylaxis.
2. List causes of anaphylaxis.

3. List common foods that can cause an anaphylaxis reaction.
4. Describe avoidance prevention measures associated with the causes of anaphylaxis.
5. Describe their individual role and responsibilities to provide avoidance prevention measures for students with life-threatening allergies.
6. Describe allergy symptoms that may require immediate emergency treatment.
7. Demonstrate the ability to implement the emergency action plan for a student with a life-threatening allergy, including the administration of an epinephrine autoinjector and contacting emergency medical services.

Curriculum Review

The curriculum draft was disseminated to the OSPI Health Services Program Specialist, three school nurses, and an infusion nurse educator for review of content and recommendations for changes or improvement via e-mail. The reviewer's responses of the curriculum content and organization of information were positive with a few recommendations for including additional information and changes in formatting. After considering the recommendations, the curriculum was revised, the learner goals and objectives were added, and the curriculum lesson plan and learner materials were developed. The curriculum was organized into a PowerPoint® presentation and then the completed presentation with lesson plan and materials were shared face-to-face with the nurse team leaders and the health services coordinator of Northshore School District, the infusion nurse educator, and sent via e-mail to the OSPI Health Services Program Specialist. The curriculum presentation materials were well received by all of the nurses with no recommendations for changes. The OSPI Health Services Program Specialist asked to post the curriculum to the School Nurse Corps supervisors as soon as possible.

Training of School Nurses on the Curriculum

The Washington State school nurses learned of the Anaphylaxis Education curriculum during a teleconference introducing the OSPI *Guidelines for Care of Students with Anaphylaxis* (2009). The curriculum was disseminated to the School Nurse Corps supervisors, the toolkit was posted on the SNOW website, and 55-min training sessions were offered to state school nurses. The objective

of this training is to familiarize school nurses with the curriculum, materials needed to teach the curriculum, use of the lesson plan, and the teaching-learning methods to use in providing the instruction to school staff. The curriculum can be presented to school staff in a 50-min session or the didactic portion can be provided electronically to learners and the case study portion presented in a 20-min session at a later date. Additionally, the case study portion can be used in a mid-year training session to reinforce learning and in an emergency preparedness disaster drill. The postdrill debriefing offers school administrators, safety committee members, and the school nurse an opportunity to evaluate the areas of focus needed in future staff trainings.

Implications for School Nurse Practice

To meet the school nurses' training needs a toolkit was developed that provides school nurses with a curriculum, lesson plans, teaching-learning activities, and resources for anaphylaxis education of school staff. The curriculum includes anaphylaxis awareness; avoidance procedures, recognition of symptoms, and the administration of epinephrine; and implementation of a student's emergency care plan in accordance with the Washington State OSPI (2009). The curriculum was included in a toolkit containing a PowerPoint® presentation with presentation notes, handouts, and resources accessible to any school nurse and has been posted on the SNOW website. This toolkit will enable school nurses in Washington State to comply with the *Guidelines for Care of Students with Anaphylaxis* (OSPI, 2009) and the Anaphylaxis Policy Guidelines (RCW 28A.210.380) to collaborate with school administrators in providing school staff training in anaphylaxis and meet the goal of the curriculum which is that: school staff will be able to adopt the knowledge and skills to feel confident in fulfilling their responsibilities of providing a safe learning environment and implementing an emergency action plan for a student with a life-threatening allergy.

The major benefit of this project is the contribution to students with life-threatening allergies and their families. Students with life-threatening allergies benefit because school staff will know how to care for them during an anaphylaxis emergency.

Parents benefit by having the peace of mind that school staff can ensure a safe learning environment for all students. This project is of particular benefit to school nurses in that it provides a no-cost integrated curriculum, lesson plans, and recommendations of materials. School nurses often do not have the expertise or time to develop such a curriculum nor funding to access curricula that are sold. School nurses whether novice or expert, benefit by receiving training and access to curriculum in order to effectively educate school staff in anaphylaxis.

CONCLUSION

This curriculum, designed to prepare school nurses to train staff on anaphylaxis, provides a much needed resource to school nurses and advances school nursing practice. To further advance this project, a plan for evaluation needs to be developed in order to evaluate this curriculum, the implementation, and school nurse use and satisfaction with the new anaphylaxis toolkit. Future work might be directed toward the evaluation of the training effort, consideration of the impact of the policy on the health and safety of the children, and parental perspectives. The data gathered from the summative evaluation will provide information for revisions needed in curriculum information, resources and methods of instruction, and will also determine if the policy is effective in addressing the needs for which it was developed. Research and education about anaphylaxis will need to be periodically monitored to determine if changes are needed in the curriculum to reflect best practice guidelines and as the science progresses, the policy will need to be evaluated for its appropriateness.

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