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Improving Asthma Management in the Elementary School Setting: An Education and Self-management Pilot Project

Natasha McClure, DNP, RN, CPNP [a,*], Mackenzie Seibert, MSN, RN [b], Taylor Johnson, MSN, RN, CPNP [b], Leslie Kannenberg, MSN, RN [b], Trey Brown, MSN, RN, FNP-C [b], Melanie Lutenbacher, PhD, MSN, RN, FAAN [c]

[a] Vanderbilt University School of Nursing, 315 Godchaux Hall, 461 21st Avenue South, Nashville, TN 37240, United States
[b] Vanderbilt University School of Nursing, 461 21st Avenue South, Nashville, TN 37240, United States
[c] Vanderbilt University School of Nursing, 524 Godchaux Hall, 461 21st Avenue South, Nashville, TN 37240, United States

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ABSTRACT

Purpose: To increase daily asthma symptom self-assessments of elementary school students using Green Means Go, an asthma education and self-assessment program, via a partnership between an elementary school and a school of nursing.
Methods: Over four months, accelerated MSN nursing students provided small group education sessions to teach students and teachers to identify asthma symptoms by Asthma Action Plan (AAP) zones and actions for each zone. To promote continuity of care between school and home, a teacher-parent communication log during yellow zone days was encouraged.
Results: Students with asthma (n = 90), teachers (n = 12) and parents (n = 1) participated. Previously no students performed daily self-assessments and at program end, all students accurately identified symptoms, AAP zones, and action steps. A total of 789 symptom self-assessments were recorded. Teachers reported increased asthma knowledge. One parent attended an education session and one home visit was completed. No communication logs were returned.
Conclusions: Partnerships between elementary and nursing schools may be an effective strategy for delivery of health programs to high-risk children with chronic diseases. Self-assessment of symptoms and taking appropriate actions at school are critical components of early asthma intervention, particularly when a school nurse is not always available. Training teachers to follow a child's AAP within school policies is a critical second step. Home visits showed potential as a strategy for engaging parents.
Practice implications: In the current climate of school nurse shortages, management of asthma-related episodes in school can be improved with similar partnerships and programs that promote health education and self-management.

Background

Over 8% of children in the United States (US) under the age of 15 have a diagnosis of asthma (Centers for Disease Control and Prevention [CDC], 2016). Childhood asthma prevalence in Tennessee (TN) is 9.5% (Brantley, 2018). National asthma management guidelines recommend that every patient with asthma have an asthma action plan (AAP) provided by a clinician (National Heart, Lung, & Blood Institute [NHLBI], 2007a, 2007b). Asthma management guidelines specifically developed for schools outline the minimum standard for every child with asthma. To meet this standard, each child must have a written AAP, update it regularly, share it with all teachers and school staff that provide educational support to the child with asthma, and ensure access to assistance from trained personnel is provided (NHLBI, 2014). However, many schools do not comply with this recommendation. State and school district policies determine a school's mandate for having such a plan in place, as well as allocating resources to schools to care for children with asthma.

Written AAPs serve as a guide to patients and families for symptom self-management. They include a description for when and how to adjust medications and when to seek emergency medical care (Edwards, 2013). A commonly used AAP model is the "traffic light" with green, yellow, and red zones. Each color zone corresponds to a symptom level (i.e., green = symptom free; yellow = asthma symptoms present; red = severe symptoms present) (NHLBI, 2007a, 2007b). The yellow zone indicates loss of asthma control and is a trigger for the use of quick relief medications to manage immediate symptoms in a setting outside of a medical care facility (Dinakar et al., 2014). If symptoms are unrelieved after a period of time in the yellow zone, parents are

* Corresponding author.
E-mail address: Natasha.j.mcclure@vanderbilt.edu (N. McClure).

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instructed to consult their healthcare provider to reduce the risk of further exacerbation requiring emergency (ED) care or hospitalization. If severe symptoms are present and unrelieved by quick relief medications, such as in the red zone, caretakers are instructed to seek ED/urgent care immediately (NHLBI, 2007a).

School nurses have a key role in asthma management in this setting. They are responsible for coordinating all essential components of asthma management, such as ensuring each student has an AAP and a quick-relief inhaler, recognizing asthma symptoms, and implementing the AAP (American Lung Association [ALA], 2009). Most importantly, nurses are equipped with the assessment skills required to monitor a child's condition over time and provide asthma management education to school staff and teachers (ALA, 2009).

School-based asthma education programs, particularly those that include teachers and parents, can improve health and asthma knowledge, self-efficacy and self-management (Coffman, Cabana, & Yelin, 2009; Findley et al., 2011). Significant challenges associated with such efforts include the part-time nature of many school nurses and multi-school responsibilities. At least 30% of public schools have a nurse who works part-time in one or more schools. Only 45% of schools have a nurse present throughout the entire school day every day (Robert Wood Johnson Foundation [RWJF], 2013). These time constraints are a significant barrier to a school nurse's ability to provide asthma education or perform routine asthma symptom assessments and challenge the school to provide effective support to the children with asthma.

Health promotion and patient education interventions delivered through academic partnerships with schools of nursing and a partner organization may be a mutually beneficial solution to address this problem (Smith, Lutenbacher, & McClure, 2015). When the partner organization is a high need, low resource school with a gap in nursing coverage, nursing students are able to provide a needed service and potentially alleviate the healthcare delivery burden for the school (McClure, Lutenbacher, O'Kelley, & Dietrich, 2017). Such partnerships also provide a means for bridging the practice preparation gap in regard to nurses caring for vulnerable populations in the primary care setting (Kreulen, Bednarz, Wehrwein, & Davis, 2008).

School aged children spend most of their wakeful time at school, however, schools may not have processes in place to notify healthcare providers or parents when a child has a yellow zone day or uses quick relief medication. If symptoms are unreported during this key time, opportunities to continue the AAP at home or arrange primary care appointments to manage asthma symptoms before they worsen are lost. This may result in a potentially avoidable school absence, ED visit or hospital admission.

Measuring the frequency of asthma symptoms, such as wheezing or use of a quick relief medication, is recommended. Clinicians are able to use this data to evaluate how well asthma is controlled, determine the frequency for follow up care required to achieve good asthma control, or establish the need for referral to specialists (NHLBI, 2007a). Stepping up or down on recommended medications may be indicated based on symptom frequency (NHLBI, 2007b).

Local Problem

In the state of Tennessee, the current full-time school nurse to student ratio is 1:3000 (Tennessee Department of Education, 2017). In one large metropolitan school district in Tennessee, the staffing ratio and procedure-driven model of care require that the nurse's time be primarily used to perform skilled nursing procedures that may not be delegated, such as administration of tube feeding, according to the Tennessee Board of Nursing (TN BON) standards (TN BON, 2016). Tasks such as medication administration and supervision of medication self-administration may be delegated to trained school personnel (TN Dept. of Education and TN Dept. of Health, 2014). In this staffing model, nurses are often assigned to multiple schools in order to maintain compliance with state laws and school policies. The school in the pilot site for this project is responsible for multiple schools and is on site monthly and routinely available by phone to school staff and teachers.

The local public school district uses parental report to identify diagnoses for chronic diseases, such as asthma, through routine collection of health history forms each academic year. Through this process, it was determined that approximately 5000 students districtwide reported a diagnosis of asthma. An audit of the pilot elementary school was conducted to determine the scope of the problem at the school level. This revealed that 60 students (18%) reported having a diagnosis of asthma. Of those, only 23 diagnoses had been confirmed by a healthcare provider and had an AAP in place that reflected the provider's orders for medications the child should use when experiencing asthma symptoms. Of all students identified, only 9 (15%) had access to a quick relief inhaler (albuterol) at school. No existing asthma resources were identified within the school. These findings supported the need for asthma resources at this particular school and underscored the significance of undertaking this project.

School office staff are trained by the school nurse to identify asthma symptoms and to oversee medication administration, including asthma inhalers. School administrators indicated that staff could potentially implement three asthma interventions. These included administering asthma medication (albuterol) if available, contacting a parent if medication was unavailable, or if medication did not alleviate symptoms, contacting emergency medical personnel if the child was in distress. Children in no apparent distress, whose parents could not be reached, returned to class.

Aim

The primary aim of this project was to pilot test the implementation of Green Means Go (GMG), an asthma education, self-assessment, and self-reporting program developed by nursing students and faculty. The goals of the project were to: 1) increase the number of children who perform daily asthma symptom self-assessments and increase knowledge of appropriate symptom identification and initiation of a child's asthma action plan (AAP) among children, parents and teachers, 2) increase communication between parents and the school when a child was in the yellow zone and the AAP should be initiated and, 3) provide nursing students with a relevant community health clinical experience to learn about chronic disease management in the school setting.

Methods

This project was implemented in one elementary school within a large, urban public school district in Middle Tennessee with approximately 84,000 students enrolled. The pilot school reported enrollment of 349 pre-K through fourth grade students with an average daily enrollment of 318. The student body was comprised of 89.7% African American, 5% Hispanic and 2% white students. Almost all students (96.9%) were economically disadvantaged (Tennessee Department of Education, n.d.).

Developing the Partnership and Planning the Intervention.

The academic community partnership (ACP) emerged through an outreach effort by the school of nursing faculty member, who approached the school principal with a proposal to provide a school-based asthma management program. Key school system stakeholders were identified and included school staff in a supervisory capacity at the district level, principals, teachers, and support staff. High interest in a possible program emerged and a subsequent meeting at the proposed site school was organized. During the meeting, elementary school staff and the principal expressed multiple concerns related to students with asthma at their school. These included the large number of students with asthma, lack of resources for these children within the school, knowledge deficits of teachers and school staff about asthma symptom identification and management, limited school nurse