

ASTHMA MANAGEMENT IN ELEMENTARY SCHOOLS

by

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### **Abstract**

Asthma is one of the most prevalent chronic illnesses of childhood, affecting 6.8 million children in the US, and being a major cause of school absenteeism (American Lung Association, 2014). The total number of school days missed because of asthma related issues has increased to 13.8 million days in 2013 as compared to 12.4 million in 2003 (The Center for Disease Control and Prevention [CDC], 2015). If asthma is not managed in children at school it can reduce academic performance rates. Because of the need for asthma to be controlled in the school setting to decrease absenteeism and promote the health and academic success of children diagnosed with asthma, it is important for school nurses to coordinate an effective asthma management program for children diagnosed with asthma. A program evaluation was conducted to assess the asthma management program in place at an elementary school in eastern North Carolina compared to best practices for management of asthma in schools. Data collected from key informants revealed that school staff is well educated on policies and procedures to manage students' asthma, but some students still have unmanaged asthma. Data was collected through observation and participation in the school nurse's role. Policies on medication administration were read and data was gathered about asthma medications, action plans, and adherence. When compared to best practices, the school's asthma management program was determined effective. Recommendations included continued education towards students and their caregivers, which can be done by calling home and educating caregivers when they come into the health office to drop off medications.

*Keywords:* Asthma management program; best practice; elementary school

### Asthma Management in Elementary Schools

Asthma is one of the most prevalent chronic illnesses in children and currently affects 6.8 million US children under age 18. This chronic disorder is one of the main causes of school absenteeism and is the third leading cause of hospitalization for children under age 15 (American Lung Association, 2014). In 2013 there were approximately 13.8 million school days missed because of asthma related health issues. Boys, non-Hispanic black children, and children from poor families are at increased risk for having asthma (U.S. Department of Health and Human Services, 2012). If asthma is not managed in children at school it can disrupt them and their classmates and reduce academic performance rates. Because of the need for asthma to be controlled in the school setting to decrease absenteeism and improve academic success, it is important for school nurses to coordinate an individualized action plan for children diagnosed with asthma to manage asthma at school. This project is a program evaluation of an asthma management program already in place at an elementary school in eastern North Carolina. The purpose is to compare the components of the asthma management program at the school to evidence based practices to ensure effective management of childhood asthma. I worked directly with a school nurse over seven weeks observing and participating in collaboration with her to gather data about the asthma management program in place at the school.

#### **Background and Significance**

Between the years 2006 and 2010, an average of 38.4% of children with asthma in the U.S. reported having uncontrolled asthma. The Centers for Disease Control and Prevention (CDC) reported that there was no geographic pattern to the level of asthma control or the severity of children's asthma symptoms. The total percent of children with asthma in the U.S. who reported at least one missed school day because of asthma related issues has declined to 49.0% in

2013 as compared to 61.4% in 2003. However, the total number of days missed because of asthma related issues has increased to 13.8 million days in 2013 as compared to 12.4 million in 2003. In 2013 there were over 3,500 children under age 18 with asthma that reported having one or more asthma attacks that year (CDC, 2015).

Although more children have health insurance coverage than adults, there are still cost barriers to health care reported by children's parents, including not being able to afford to go see a primary care doctor, an asthma specialist, or to afford asthma medication. As a result, fewer than 50% of children with asthma receive an asthma action plan, although, children are more likely to learn to manage their own asthma compared to adults with over 80% of children being taught how to recognize symptoms of their disease (CDC, 2015).

There have been several initiatives developed in an attempt to overcome the challenge of managing children's asthma at school, including school nurses educating teachers and parents. Although some asthma management programs that focus on school-based treatment are successful, there is limited progress in encouraging schools to provide asthma action plans to the students (Maa, et al., 2010). School-based interventions can help students with asthma to better control their illness, improve quality of life, and improve academic success. Many successful school programs include a variety of interventions including controlling the environment, educating school employees, and implementing policies and procedures in case of an asthma attack (Aloola, et al., 2014). School nurses play a vital role in organizing and implementing these interventions in efforts to manage asthma in children at school.

### **Literature Review**

The literature showed important components in asthma management programs for children in elementary schools. Three common themes were found in successful asthma

management programs that lead to better asthma related health outcomes for children and less hospitalizations because of asthma attacks. These themes are healthcare coordination, education, and parent involvement.

### **Healthcare Coordination**

In a study by Findley et al. (2011) including a sample of 724 children with asthma, findings were that effective asthma management programs involve collaboration between the student with asthma, families, medical providers, and the school nurse. Communication between these groups improves asthma management behaviors by allowing the multiple influences to guide asthma care plans for the child and promote consistent adherence to the care plan at home and at school. Healthcare providers can provide the child with an individualized asthma action plan, information on management strategies to control asthma, and provide community resources for the child for support (Findley et al., 2011). Engelke et al. (2014) found that by collaborating with health care providers, school nurses can help create an asthma action plan for the child at school. School nurses can then communicate the plan with other school staff to create a safe environment for the child. Basing care on the treatment plan from the healthcare provider, the school nurse and other staff can ensure proper medical equipment is available and working, emergency contact information is available, accommodations are provided, triggers are reduced, signs and symptoms can be identified, and other management strategies to control the children's asthma (Engelke et al., 2014).

Garwick et al. (2015) focused their study on school nurses and found that school nurses are central to communication because they see the child at school, are in contact with the family, and can interpret provider's asthma action plans. School nurses are responsible for gathering information, assessing risk for asthma episodes, prioritizing needs, and planning for the needs in

the school. This allows for individualized care for each child diagnosed with asthma and better asthma control (Garwick et al., 2015). The healthcare provider gives the child an asthma action plan for the child to be able to self-manage his or her asthma at home and at school. Parents are able to monitor compliance with the individualized plan at home and communicate with school staff about barriers and facilitators towards compliance at school, and vice versa. To promote compliance, the nurse can educate school staff and families about the action plan and the importance of adhering to the course of treatment (Maa et al., 2010). Flores et al. (2009) found that when families are properly educated and are able to communicate between the school and healthcare providers, asthma care is improved because caregivers can advocate and act as a resource for their child to enhance asthma management through collaborating with a clinical team.

### **Education**

Kawfha et al. (2015) found that in order to properly manage asthma in elementary schools, parents or caregivers, teachers, and other school employees must receive information and education about asthma and how to manage it in children. It is important for caregivers to be aware of their child's disease and management strategies at home to prevent worsening symptoms and exacerbations at school. Information such as asthma signs and symptoms, triggers, medications, and what to do if an asthma attack occurs improve caregiver's knowledge and understanding of how to manage their child's asthma (Kawfha et al., 2015). Turyk et al. (2013) provided a sample of 218 children with an education intervention including information on general asthma knowledge, asthma triggers, and medications. Turyk found that education about the risks associated with stopping or running low on asthma medication during school promotes medication adherence and improves asthma control. Education about how to reduce

asthma triggers at home has shown to reduce the number of asthma attacks a child has, decrease hospitalizations because of asthma related problems, and decrease missed school days because of asthma issues (Turyk et al., 2013).

Kawafha et al. sampled 80 teachers and found that they benefited from education interventions to improve knowledge about asthma management of children at school, which resulted in improved health statuses in children with asthma. Teachers were able to provide a safer school environment for children with asthma after receiving education about asthma management. Reducing triggers in the classroom, identifying signs and symptoms, and knowing how to control worsening symptoms improved children's asthma related health outcomes during the school day (Kawafha et al., 2015).

Horner and Brown (2013) conducted a study in which they provided multiple modes of education to a sample of children in rural areas and found that education is best given in multiple formats. Successful asthma education interventions included booklets, home visits, feedback letters, and informational sessions held at the school. A combination of home asthma plan booklets and home visits decreased school absenteeism from asthma related health issues and improved health outcomes of asthma by providing caregivers and children with information on management strategies at home, as well as a chance to ask individualized questions about asthma control (Horner & Brown, 2013). Butz et al. (2014) found that feedback letters improved both students' and caregivers' knowledge about asthma by explaining tips for trigger remediation, how to keep up with asthma medications, proper inhaler technique, and other recommendations for preventative care. Through a systematic review of 23 articles, Aloola et al. (2014) were able to conclude that although educational interventions have been shown to be successful in improving asthma management in children, additional interventions are needed in an asthma

management program to have a significant effect on the improvement of a child's asthma related health outcomes. Examples of additional interventions needed are parent involvement, community focus, and actions to promote a safe environment for the child with asthma (Aloola et al., 2014).

### **Parental Involvement**

Findings from a study by Durrani (2014) included that elementary school children are still dependent upon their caregivers, so parental involvement is key in managing their child's asthma. To control their asthma, parents can be involved in reviewing inhaler technique, filling asthma medications and promoting adherence, identifying environmental triggers, treating comorbid conditions, and helping the child follow an updated asthma action plan if a healthcare provider has provided one (Durrani, 2014). Sweet et al. (2013) conducted a home-based study and found that in order to prevent worsening symptoms at home and at school, parents can take part in reducing triggers around the home and helping the child identify environmental triggers at school. Ways parents can reduce triggers around the home include using allergen-impermeable encasings, preventing smoking allowed in the home, using fragrance-free cleaners, and using a bathroom fan during showers. These trigger control methods have been shown to improve asthma symptoms, decrease night awakenings, and decrease the number of days with activity limitations at school (Sweet et al., 2013). East Carolina is more humid than the central and western side of the state. Additional steps for parents to be aware of when managing triggers in Eastern Carolina are the use of HEPA vacuums to control the moisture level and reduction in the amount of mold, mildew, dust, and pets in the home (Kearney et al., 2014).

In addition to controlling triggers, parents also play a role in setting up appointments for their child to see a pulmonologist or allergist for continued care. Taking a child to an asthma



specialist and following up with care improves asthma management in children and improves asthma health outcomes (Turyk et al., 2013). Burkhart et al. (2012) found that parents were able to promote asthma self-management in their child and intervene early if symptoms are worsening. Parents can monitor peak flow measurements when their child uses the peak flow meter to detect airway obstruction before it worsens so measures can be taken if necessary (Burkhart et al., 2012). Horner and Brown (2013) concluded from their study that educating parents and encouraging them to play a role in their child's asthma management can improve asthma related health outcomes and reduce the number of missed school days because of asthma issues.

## **Methodology**

### **Design**

This project was a program evaluation of an asthma action program already in place at an elementary school. The goal of this program evaluation was to compare the asthma management program in place at the elementary school to best practices to ensure effective management of childhood asthma. The first objective was to identify the major components of the program and to interview key informants about the strengths and weakness of the program. The second objective was to review components of the asthma management program at the school compared to evidence based practice. The third objective was to identify strengths, gaps, or weaknesses in the existing asthma management program by February 24, 2016. Two questions to be used in the program evaluation were developed based on the main findings of the literature review. The first question asked how the components of the asthma management program at the school compared to best practices. The second question asked what the role of the school nurse is in implementing policies and procedures related to asthma management.

**Setting and Sample**

In the eastern North Carolina county where the elementary school is located, 22.8% of the population is under the age of 18 years. The majority of the population is Caucasian at 57.9%, followed by 33.2% African American. Between the years of 2009 and 2013 it was reported that 24.5% of the population in the city fell below the poverty level based on calculated factors such as annual income, age, and number of people living in the household (U.S. Census Bureau, 2015). From 2009 to 2013 the Infant Mortality Rate (IMR) for the county was 8.2 per 1,000 live births for the White non-Hispanic population compared to the minority IMR of 11.1. The calculated disparity ratio for these years was 1.35. Although small, some racial disparity remains in the county with the African American non-Hispanic populations having a higher IMR compared to the White non-Hispanic population. The largest age group is under 18 years old at 22.8% of the county compared to 7.5% being under 5 years old and 17.9% being over 65. In this county the rate of children less than 15 years old admitted to the hospital because of asthma related issues was 78.3 per 100,000 in 2010 compared to the North Carolina state rate at 166 per 100,000 (NC State Center for Health Statistics, 2014).

The target population was school age children diagnosed with asthma who receive asthma management care at the elementary school. The elementary school is located in a low-income neighborhood surrounded by other low-income neighborhoods. The majority of people living in these neighborhoods and attending the school are African American, although there are a small percentage of Caucasians and other ethnicities that also attend the elementary school. The houses around the school are modest, and a few houses in each neighborhood need some renovations such as a new roof. There are various health services concentrated around the regional medical center, as well as a few grocery stores and fast food restaurants also concentrated in one area.

Since the elementary school is located in a low-income area, many children attending the school may not have proper healthcare and may not have the appropriate education regarding asthma management.

The North Carolina Asthma Plan has addressed a few key goals related to asthma management that should be recognized by the school health system. These goals include, “increasing asthma education in schools, ensuring that schools are safe and healthy environments for children with asthma, developing and promoting a standardized asthma education curriculum, and enhancing community-based asthma coalition and workgroup activities” (The North Carolina Asthma Plan, 2012, p. 11). In order to meet these goals it is important for the school nurse to follow policies and procedures about maintaining a safe school environment, as well as educating the school community about asthma management. Almost one third of the population living in New Bern falls below the poverty level, so access to proper healthcare for these children is a major barrier towards living healthy lifestyles. Transportation is another barrier for low-income families. Many families with children diagnosed with asthma may not be able to afford transportation to various educational sessions on asthma management. The social and physical environment and individual behavior are factors that the school nurse must take into account when planning interventions for the school community to reach the goals created by the North Carolina Asthma Plan.

### **Data Collection**

There were 410 children total in the school, and 59 of these children had a known diagnosis of asthma. The CDC reports that 1 out of 10 children in a classroom had a diagnosis of asthma (2015). Of those with asthma, only 39 students had inhalers at the school in the health office, and only 12 students had a written asthma action plan given to them by a healthcare

provider. I compared the asthma management program in place at the elementary school to best practices for management of asthma in schools. I reviewed existing procedures the school nurse takes to manage asthma. This included the process of obtaining necessary asthma medications from caregivers or healthcare providers, and the medication administration process. Data was gathered through interviewing three key informants: the school nurse, the principal, and a fifth grade teacher. The informants were asked three standard questions regarding whether they could identify an asthma exacerbation, if they feel the children at the school have well managed asthma or not, and their specific role in managing asthma. Data was collected through observation and participation in the school nurse's role. Policies on medication administration were read and data was gathered about asthma medications, action plans, and adherence. A table was created with two columns to compare key findings of an asthma management program from evidence-based research to the existing components of the program at the school.

### **Findings**

The management strategies at the school were compared to best practices using a table for side-by-side comparison. Fifty-nine children at the school have a known diagnosis of asthma. Of those with asthma, 39 have inhalers maintained in the health office and most of them routinely come in with asthma symptoms at some point during the year. The principal, teachers, and school nurse all have unique roles in managing asthma at the school. School staff is educated on recognizing asthma exacerbations and the protocol on what to do if one were to occur. Every year school staff must attend various training sessions, including a power point presentation on managing asthma with handouts to reference. The school has policies on getting provider's orders for administering asthma medication, the caregiver's approval for medication administration at school, and documentation of when medications are administered. There is

collaboration between the school nurse, caregivers, and providers from different offices and health departments to provide consistent, individualized care throughout the year.

### **Limitations**

The main limitation of this project is related to the fact that many of the children move and live with different family members throughout the year. This limited the ability to clearly evaluate the effectiveness of the school's collaboration with the primary caregiver.

### **Implications for Practice and Policy**

This project met the goal of evaluating the asthma management program at an elementary school and comparing it to best practice. The program had many strengths including education among school staff to provide a safe school environment for students with asthma and how to appropriately respond to worsening signs of an asthma exacerbation. Teachers actively participated in management strategies in the classroom such as cleaning dusty shelves and ensuring no mold on the windows, both being asthma triggers. Annual education sessions to manage asthma allows school staff to stay up to date with management strategies and encourages them to participate in the child's care. Areas for improvement were identified and recommendations were given based on these gaps in the schools program. Areas for improvement included educating caregivers about reducing asthma triggers at home, caregivers reviewing inhaler technique with the child, caregivers monitoring peak flow measurements, and obtaining individualized asthma action plans from providers to keep at school. During the time spent at the school a poster with pictures was created and is now hanging in the health office at the school showing students appropriate inhaler technique. The health department was contacted and information was exchanged about peak flow meters being covered by Medicaid and the importance of using them to identify early symptoms of an asthma exacerbation. The health

department was also praised for giving their clients with asthma an individualized asthma action plan and requested to continue doing so.

Collaboration between the school nurse, providers, and caregivers was also a strength and provided the students with individualized and consistent care at school. Caregivers were called to remind them of needed appointments, any health status updates, and to follow up on the appointments to coordinate care. Health care provider offices were contacted to receive necessary information regarding patient status and individualized care plans for the student while at home and school. It is important to keep a record of each child, an emergency contact, multiple family members contact information, and their healthcare provider's contact information at school so the school nurse can collaborate and coordinate care.

This project revealed the challenge of coordinating care for the student at home with parents or caregivers. It is important to set goals with the family and work with them to meet these goals. Parental involvement is a major component of asthma management based on best practices and can help the child's symptoms between home and school. The school nurse educates students during the day, but reinforcement by caregivers at home will improve the management strategies and improve the student's ability to participate more in their own care.

The school nurse is the leader in coordinating care for the students. He or she acts as a community health nurse by using multiple public health interventions to improve the health of the school. In this project the school nurse uses collaboration, health teaching, and policy enforcement most frequently to manage students' asthma at school. With the school nurse leading and managing care for students with asthma, an evidence based asthma management program at the school can improve student's health status and thus improve academic success by reducing days missed because of asthma related health issues.

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