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Laura Hunt
laurakatherine1011@yahoo.com

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Laura Hunt, Student

Dr. Leslie Scott, Advisor

Effectiveness of a School-based Asthma Education Program for 8-10-Year-Old Children

Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Nursing
Practice at the University of Kentucky

By

Laura Hunt, BSN, RN

Lexington, KY

2020

Abstract

Background: Asthma is the most common chronic condition to affect children in the United States. Five million children throughout the United States and approximately 112,000 children in Kentucky are living with the diagnosis of asthma (CDC, 2017; CHFS, 2017). Based on current rates, 1 out of 10 elementary school-age students will likely have asthma (CDC, 2019). Educating elementary-age students about asthma and symptoms of an asthma exacerbation is very important and could save a life.

Methods: A school-based asthma education program targeting children in third and fourth grades was implemented at two elementary schools in Central Kentucky. The asthma education was conducted during student's physical education/health classes. Program effectiveness was measured with the use of the Asthma Knowledge Test for 8-10-year-olds pre-intervention and post-intervention.

Results: A total of 71 students participated in the program. A paired t-test was used to compare pre-test scores on the Asthma Knowledge Test for 8-10-year-olds with the post-test scores. There was a statistically significant difference in pre-test/post-test scores ($p < 0.001$).

Discussion: Asthma affects many school-age children. It is important for classmates to have a basic understanding of asthma exacerbation symptoms to help ensure a safe school-environment for children with asthma. The school-based asthma education program was a useful tool to increase overall asthma knowledge in children ages 8-10-years-old.

Conclusion: The school-based asthma education program was effective in increasing overall asthma knowledge among 8-10-year-olds. This study can be used to help schools develop their own asthma education programs to provide information for students to quickly recognize symptoms of an acute asthma exacerbation in a peer and get them the help they need as soon as possible.

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Effectiveness of a School-based Asthma Education Program for 8-10-Year-Old Children

Background and Significance of Proposed Project

Problem identification

Asthma is the most common chronic condition to affecting children and adolescents in the United States (Center for Disease Control and Prevention (CDC), 2017). In 2018, 5.5 million children under the age of 18 of age in the United States, and approximately 112,000 children in Kentucky are currently diagnosed with asthma (CDC, 2018; Kentucky Cabinet for Health and Family Services (CHFS), 2017). Also, it is reported that 3 children among a class of 30 elementary school-age students will likely have asthma (CDC, 2019)

Context of Problem

The American Academy of Allergy, Asthma, and Immunology (AAAAI) defines asthma as experiencing coughing, wheezing, difficulty breathing, chest pain or tightness, and feelings of fatigue or tiredness after being exposed to a certain trigger (AAAAI, 2019). Triggers are exposures that cause individuals with asthma to experience signs and symptoms. Common triggers include dust, pet dander, mold, pollen from plants, smoke, cold temperatures, exercise, and viral and bacterial infections (Nazario, 2018). When exposed to one or more of these triggers, a cascade of events leading to a tightening, or a narrowing, of the airway develops. In addition to tightening of the airway, cells in the lungs react with the trigger leading to an increase in mucous production in the lungs. The narrowing of the airways and the increase in mucous production cause difficulty breathing and the classic symptoms associated with asthma including coughing, wheezing, rapid respiratory rate, and reported chest tightness (American College of Allergy, Asthma, and Immunology, 2014).

Unfortunately, there is no cure for asthma, but it can be well controlled with adherence to the correct treatment plan (AAAAI, 2019). The National Heart, Lung, and Blood Institute (2012) developed a stepwise approach to treating asthma based on age, severity of disease/symptoms, and level of disease control. Management with medication administration is one portion of this stepwise approach. Several medications are available to help prevent and treat asthma symptoms in children.

The most important aspect of asthma care is asthma education. Asthma education, as discussed by The National Heart, Lung, and Blood Institute, is the cornerstone of asthma care and focuses on many aspects of the disease and treatment. Many educational programs have been

created for the general public, individuals with asthma and parents/caretakers of those individuals with asthma (NHLBI, 2012). For example, the NHLBI created a specific program for people with asthma called the National Asthma Education and Prevention Program (NAEPP). The CDC has been instrumental in developing many online resources about asthma, asthma facts, and asthma management. Most of these educational programs have been geared toward parents of children with asthma and older children with asthma. The NAEPP and the CDC have worked together on many projects as well. For example, the NAEPP created an asthma presentation resource for schools, Asthma Basics for Schools, explaining different aspects of asthma (CDC, 2008). In this two-part presentation, it emphasizes asthma education for all school officials, teachers, and students. Whereas this program is very useful, it is focused on teaching adult school officials and teachers.

Educating children about asthma is also part of the goals set by the NAEPP as presented in Asthma Basics for Schools Part 1 (CDC, 2008). Many tools have been created to assess asthma knowledge in school officials, teachers, and parents, however, no such tool had been created for school aged children until 2010 (Al-Motlaq & Sellick, 2011). The Asthma Knowledge Test for Children ages 8-10-years-old is the only tool of its kind developed to assess the knowledge of asthma in children who have asthma and children who do not have asthma (Al-Motlaq & Sellick, 2011). Educating students about asthma is very important because children are peer-centered and spend most of their time around other students their age. It is important for children to learn at an early age the seriousness asthma. Children also need to know that asthma is not a disease which they can “catch”. Most importantly, children need to understand how to get help for a friend experiencing an asthma exacerbation. For example, if a child during recess starts to demonstrate signs and symptoms of an asthma exacerbation, one of their friends will likely notice the symptoms before a teacher. If all children are educated on asthma exacerbation signs and symptoms, early recognition and reporting to an adult may lessen the possibility of an adverse event.

Scope of Problem

According to the Asthma and Allergy Foundation of America (AAFA) (2019) nearly 50% of children age 18 and younger who had asthma reported having one or more asthma exacerbations per year in 2015. This high number of asthma exacerbations leads to a high number of emergency department visits and hospitalizations. In fact, asthma related visits are the

third highest reason for hospitalizations in children (AAFA, 2019). In addition, the AAFA states, “asthma accounts for 9.8 million doctor’s office visits, 188,968 discharges from hospital inpatient care and 1.8 million emergency department visits each year” (2019).

Consequences of Problem

Asthma exacerbations are serious, and they may require emergency medical evaluation and treatment depending on severity of signs and symptoms. In addition to asthma exacerbations, the chronic condition causes children to be susceptible to additional adverse outcomes. Asthma accounts for an average of 13 missed school days per student with asthma per year (CDC, 2013). Missing school leads to lower academic excellence, to delayed mental and emotional development, and to lower self-esteem (Eaton, 2012).

Unfortunately, research shows that a high percentage of children diagnosed with asthma use emergency care versus primary care as a frequent place of health services (CDC, 2016). This can contribute to the overuse of emergency department resources. It also increases the economical cost for families with children with asthma. According to the AAFA (2019), a total of \$81.9 billion was spent on healthcare costs related to asthma during the years 2008-2013.

Lastly, and most importantly, ten Americans die each day as a result of having asthma (AAFA, 2019).

Evidence-based intervention

Throughout the years, many strategies for improving asthma outcomes have been researched and tested. Asthma education is one strategy showing vast improvement in a variety of outcomes among children living with the diagnosis. Asthma education has been shown to improve asthma knowledge, asthma symptoms, decrease asthma exacerbations, and asthma-related emergencies (Coffman, Cabana, Haplin, & Yelin, 2008, Ahmad & Grimes, 2011). The Centers for Disease Control and Prevention have created online programs for families such as America Breathing Easier and the CDC’s Healthy Use (CDC, n.d.). Whereas these programs are readily available, factors such as internet access, health literacy, and time management can decrease the effectiveness. School-based educational programs have been used to help bypass many of these factors and reach a more diverse population of students and adults (Coffman, Cabana, Haplin, & Yelin, 2008, Mickel, Shanovich, Evans, & Jackson, 2017). More research is needed to find the best school-based asthma educational program for children ages 8-10-years-old.

Purpose

The purpose of this project was to evaluate the effectiveness of age-related information about asthma presented to school-age children. This project consisted of creating a school-based asthma education program for students ages 8-10-years using a combination of several previously developed educational programs. The purpose of this program was to improve asthma understanding and improve recognition of asthma signs and symptoms among elementary school-aged children. The program consisted of a cross-sectional pre-test/post-test intervention design. Whole School Whole Community Whole Child, a framework created by the CDC and the Association for Supervision and Curriculum Development (ASCD), was the framework after which this program was modeled. This modeled framework focused on the child as the center of the practice and incorporated many environmental elements to ensure the overall health of children in schools. As stated by the CDC (2014), “The WSCC Model responds to the call for greater alignment, integration, and collaboration between health and education to improve each child’s cognitive, physical, social, and emotional development.”

Baseline asthma knowledge was evaluated before the start of the intervention program using the Asthma Knowledge Test (Appendix C). The intervention consisted of using age appropriate activities to educate students ages 8-10-years (3rd-4th grade) about important asthma. Topics included defining asthma, asthma triggers, asthma symptoms, physical activity with asthma, and what to do if a classmate displays signs and symptoms of an asthma exacerbation. Outcomes expected from this educational program included the following:

- Students ages 8-10-years will be able to state three signs of an asthma exacerbation
- Students ages 8-10-years will be able to state what to do if a classmate exhibits signs and symptoms of an asthma exacerbation
- Students ages 8-10-years will have an increased overall knowledge about asthma information

Outcomes were evaluated by using the Asthma Knowledge Test following the completion of the program.

Theoretical Framework

Many theoretical frameworks were reviewed when designing this project. The Whole School Whole Community Whole Child, a framework created by the CDC and Association for

Supervision and Curriculum Development (ASCD), was chosen to be the framework for which this program is modeled after. This model focuses on the child as the center of the practice and incorporates many environmental elements to ensure the overall health of children in schools. As stated by the CDC (2014), “The WSCC Model responds to the call for greater alignment, integration, and collaboration between health and education to improve each child’s cognitive, physical, social, and emotional development.”



Figure 1: Whole School. Whole Community. Whole Child:
<http://www.ascd.org/programs/learning-and-health/wsc-model.aspx>

Review of Literature

5.5 million children under the age of 18 of age in the United States, and approximately 112,000 children in Kentucky are currently diagnosed with asthma (CDC, 2018; Kentucky Cabinet for Health and Family Services (CHFS), 2017). Several strategies aimed to improve asthma outcomes in children have been developed and evaluated. Asthma education has been found to be one strategy showing vast improvements in a variety of outcomes among children living with asthma. Asthma education is the cornerstone of asthma management and has been shown to improve general asthma knowledge, asthma symptoms, decrease asthma exacerbations, and asthma-related emergencies (Coffman, Cabana, Haplin, & Yelin, 2008, Ahmad & Grimes, 2011). Because asthma education has shown to be such an asset to asthma treatment and

management, the National Asthma Education and Prevention Program (NAEPP) set goals for asthma education, including education to be provided for children, family members (especially parents), as well as school officials, teachers and fellow students (NAEPP, 2008). To fulfill these goals, many education programs have been created. The Centers for Disease Control and Prevention have created online programs for families such as America Breathing Easier and the CDC's Healthy Use (CDC, n.d.). Whereas these programs are readily available, factors such as internet access, health literacy, and time management can decrease their effectiveness. School-based educational programs have been used to help bypass many of these obstacles to reach a more diverse population of students and adults (Coffman, Cabana, Halpin, & Yelin, 2008, Mickel, Shanovich, Evans, & Jackson, 2017).

School-based asthma education programs have been utilized for many years, and each program varies in its approach. Programs have taken place during school hours (Mickel, Shanovich, Evans, & Jackson, 2017, Mosnaim, 2011, Kintner, 2015, [Liptzin](#), et. al., 2016, Levy, 2006, Chini, et. al., 2011), after school (Horner, 2016), and on weekends at the school (Horner, 2016). Programs also differ in whether they occur over time (Mosnaim, 2011, Kintner, 2015, Liptzin, et. al, 2016, & Levy, 2006) or simply once (Mickel, Shanovich, Evans, & Jackson, 2017 & Horner, 2016). Current school-based asthma educational programs incorporate a wide variety of ages, ranging from elementary-age students (Chini et. al., 2011; Levy, 2006; Horner, 2016; Kintner, 2015; Al-Motlaq & Sellick, 2011; Vasishta et. al, 2018; Mickel, Shanovich, Evans, & Jackson, 2017) to adolescents (Liptzin et. al. 2016) or both (Ahmad, & Grimes, 2011; Coffman, Cabana, Halpin, & Yelin, 2008). In a meta-analysis conducted by Coffman, Cabana, Halpin, & Yelin (2008), it was found that the more educational encounters achieved with children, the more statistically significant the increase of asthma education understanding. However, as Mickel, Shanovich, Evans, & Jackson (2017) highlight, this may be difficult to achieve as guidelines recommending the decrease in classroom interference or interruptions increase.

The use of a school-based asthma educational program has shown positive health outcomes for students with asthma. These outcomes include decreases in asthma exacerbations, decreases in number of school days missed (Liptzin et al., 2016; Ahmed & Grimes, 2011), decreases in emergency room visits (Ahmed & Grimes, 2011; Chini et. al., 2011; Coffman, Cabana, Halpin, & Yelin, 2008; Levy, 2006; Liptzin et. al., 2016), decreases in asthma

symptoms and severity of symptoms (Liptzin et al., 2016, Horner, 2016 and decrease use of asthma rescue drugs (Liptzin et al., 2016).

However, traditional school-based asthma educational programs have focused on students with a diagnosis of asthma or include the school officials or teachers as learners. According to the American Academy of Pediatrics, new studies are focusing on the important role of peers as it relates to a school's "asthma-friendliness" (Vasishta, et. al., 2018). Including children who do not have asthma in asthma education activities is beneficial by increasing overall awareness of asthma, increasing general knowledge among peers, and potentially improving the overall moral and quality of life of children with asthma (Al-Motlaq & Sellick, 2011, Vasishta, et. al., 2018). Although, it is unclear if including children without asthma in the education activities impacts the attitude associated with children with asthma (Vasishta, et. al, 2018).

Overall, studies have shown that school-based asthma education programs significantly increase asthma knowledge in both students with asthma, and without asthma. The use of these programs can affect the quality of life of children with asthma by possibly improving their overall symptoms thus decreasing adverse events. Including peers who do not experience asthma symptoms may be very useful in increasing awareness, and potentially helping students with asthma feel more included and comfortable around their non-asthmatic counterparts. This project, which will test the significance of a school-based asthma education program in both children with asthma and those without asthma, addressed this gap in the literature.

Agency Description

Setting

This school-based asthma program took place during the physical education classes at two local elementary schools- Morgantown Elementary School and North Butler Elementary School. Both Morgantown Elementary School (MES) and North Butler Elementary School (NB) are rural schools are located in the Butler County School District. MES has approximately 600-700 students consisting of primarily a Caucasian student population, but a growing percentage of Hispanic students. NB has about 400-500 students consisting of primarily a Caucasian student population. As part of the Strategic Plan for Butler County School Systems for the year 2016-2017, one of the main goals was to increase help to students who are struggling (Comprehensive District, 2016). Students with asthma often have trouble in school related to missing a higher number of school days as compared to the students without asthma.

Target Population

The program is intended for ages 8-10-years. Students in the 3rd and 4th grades attended. This age group was chosen because the measuring tool, Asthma Knowledge Test, is written for children ages 8-10 years. All 3rd and 4th grade students who participated in the physical education classes during the months of August and September were recruited to participate in the educational program. At MES, each PE class/educational meeting will have approximately 50 to 60 students. At NBES, each PE class/educational meeting will have approximately 30-40 students. Total recruited was between 200-300 students. In both schools, the physical education class also serves as the health class, so this class was chosen since asthma is a health-related issue in elementary school age children.

Congruence of DNP Project to Schools' Mission, Goals, and Strategic Plan

Asthma education and the safety of each student within the school system are very closely related. Unfortunately, this school system has seen firsthand the horrendous effects that asthma can have on students and their families. In recent years, Kentucky has proposed a plan, Kentucky State Plan for Addressing Asthma 2016-2018, to increase asthma awareness and better education and treatment for all involved (CHSF, 2016). Within this plan, school safety, air quality, and better access to education are three important factors being addressed. This project brings access to asthma education to those who might need it the most. It also helps the school system follow the Practical Guidance for Schools and School Districts to Protect Student Lung Health, which states that all school systems should provide access to asthma education to all students (American Lung Association, 2018). In addition, as part of the Strategic Plan for Butler County School Systems for the year 2016-2017, one of the main goals was increasing help for students who are struggling (Comprehensive District, 2016). Students with asthma often have trouble in school related to missing a higher number of school days as compared to the students without asthma.

Stakeholders

Many stakeholders are involved in assisting this project's success. The first and most important stakeholder is the children who will be participating in the program. The goal of the program is for the children to learn about asthma and learn what to do if a friend has an asthma attack. To accomplish this goal, the children must attend and participate in the lessons and

activities and take the pre and posttest. Next, the teachers, especially the physical education teachers, are another stakeholder. Important tasks they are responsible for include collaborating with the project coordinator to help teach the children, help keep the children engaged in the activities, and learn strategies to help children identify asthma symptoms and what to do if they witness an exacerbation. The teachers will also be helpful in organizing the pre and posttest information. Other school officials, including teachers, principals, school board members, and other school officials are important stakeholders. Roles they will play include collaborating with nurse practitioner student to set up meetings (times, area in the school that can be used, etc.), collaborating with nurse practitioner student about budgeting and helping with supplies, and encouraging participation in the program throughout the school system. Lastly, the school nurse is a stakeholder that will help educate students and teachers about asthma, as well as help when a student has an exacerbation.

Facilitators and Barriers to Implementation

As with any project, barriers exist that could affect the outcome of this project. Implementing the project during the physical education class makes the most sense in relation to topic, but this could also be an issue. Children have high expectations to have fun and play in P.E. and could potentially be interruptive. To combat this, fun activities were implemented to keep the children's focus on the project. Another barrier included parents not wanting their children to participate. The educational letter distributed prior to the program implementation worked to decrease this barrier. Other barriers were addressed as planning continued.

Although there were many barriers to this project, there were many facilitators which helped it work well. The most influential facilitators for this project included the school nurse, the health department, and the PE/Health teacher. These influential people helped promote the importance of a project such as this in their schools, as well as encouraged students to participate. Another facilitator was the need for life saving asthma knowledge in the community. As previously mentioned, this school system had experienced a worst-case scenario when an asthma attack went unrecognized and untreated. Because of this tragedy, community members were seeking the knowledge of asthma in children.

Project Design

The purpose of this program was to improve asthma understanding and improve recognition of asthma exacerbation signs and symptoms among elementary school-aged children. The design of this project was a cross-sectional pre-test/post-test quasi-experimental study. It was cross-sectional because all data will be collected at one point in time, and quasi-experimental because it used a convenience sample without randomization (Melnyk & Fineout-Overholt, 2015).

Project Methods

To carry out this project design many methods were used. This was a school-based asthma education program meaning that it was conducted during school hours with the help and permission of school officials. In order to be compliant with public school rules and policies, the help of the county super intendent and principals was enlisted. Permission to use the school system was first received from the super intendent and the individual principals at the elementary schools being used. Next, recruitment methods included discussing details of the project with the physical education and health teachers and requested permission to use the 3rd and 4th grade class time for the project. Parental permission for the children to participate in the program was sought via letters sent home to parents explaining the intervention and asking permission for participation and use of the child's pre-test/post-test results to be used in the study. All children in the 3rd grade and 4th grade that participate in the physical education class during the month of August at Morgantown Elementary School and North Butler Elementary School were recruited for this program. Exclusion criteria involve children under the age of 8 years and above the age of 10 years and students who do not have permission from their parents to participate in the program. Students not participating in the program will participate in an alternative activity during this time per the physical education teachers' specifications.

Educational methods included age-appropriate video presentations on common asthma topics, brief health provider lecture, interactive activity with health care provider and children, and a brief skit for volunteers to demonstrate what to do if a friend has an asthma exacerbation. Brief video presentations have shown to be an effective teaching strategy for asthma (Carpenter et. al., 2015). Using a handout to help them follow along with the presentation helped them to pay attention and pull out the most important topics to better understand the presentation. To evaluate outcomes all participating students will answer the questions on the Asthma Knowledge

Test for ages 8-10 years old at the beginning of the program and the end of the program.

Permission to use the Asthma Knowledge Test was given via email from the author, Mohammad Al-Motlaq. This tool has high content validity ranging from CV 0.86-1.00 for 23 of 24 items (Al-Motlaq, & Sellick, 2011).

Description of Evidence-based Intervention

The program will take place during the PE/Health class for all 3rd and 4th grade students, using a convenience sample of approximately 200 students. Before beginning the program, the PE teacher will number all pre-tests and write a list of which student receives each number so that each student gets the same number of pre-test and post-test. The PE teacher will keep this list so that the DNP student never sees it. Once numbered, each student will answer the questions on the pre-test version of the Asthma Knowledge Test for ages 8-10.

Once all students have taken the pre-test, the program will begin with an introduction of the DNP student and asking students if they know what asthma is. The education will begin with an introduction to asthma video. This video is part of the series Huff and Puff created by Health Nut Media. Permission to use this video series was given via email from Dr. Gregg Alexander, CEO and Chief Medical Officer of Health Nut Media. The series explains what asthma is, the signs and symptoms, and the treatment for asthma using characters from the children's story, The Three Little Pigs (Health Nut Media, 2018). After watching this first video, a brief PowerPoint using information from the CDC's Asthma Basics for Schools program (NAEPP, 2008) will be presented following up on what asthma is and what happens in the body to cause the signs and symptoms of asthma. Next, the children will participate in an activity where they practice breathing through a straw to help simulate how it feels to breath when you have asthma. After this activity, students will watch another Huff and Puff video about signs and symptoms followed with a video about triggers for asthma exacerbations. Each Huff and Puff video lasts approximately 3 minutes. After this video, the DNP student will briefly discuss asthma treatment before showing the last video about rescue treatments versus maintenance medications. Lastly, the DNP student will discuss what to do if one of the students witnesses another student exhibiting signs of an asthma exacerbation. This discussion will focus on recognizing the signs and finding a reliable adult close by to call 911 or to get the nurse. After this discussion, and to finish the education, students who volunteer will participate in a skit where one child will act as if he or she is having an exacerbation and the other students will find a close by adult to help

them. After the skit, the DNP student will leave the room again and the PE teacher will hand out the post-tests. The pretests and post-tests for the students who have parental permission for this information to be used in the study will be handed to the primary investigator to be graded and used in the study. This educational program will be completed in every 3rd and 4th grade PE class at two different elementary schools. Each session will follow the same format and present the same information.

Procedure

IRB Approval

School district support was obtained by meeting with the Butler County, Board of Education Superintendent and the physical education teachers at each enrolled elementary school. IRB approval was received from the University of Kentucky Institutional Review Board on October 3rd, 2019.

Sample

Students enrolled in the 3rd and 4th grades at either Morgantown Elementary School or North Butler Elementary School were eligible for inclusion into the study. The students were to be between the ages of 8-years and 10-years of age and be present in physical education class or health class in their respective elementary school at the time of project implementation. Eligibility information was obtained by the physical education teacher at each school. Once eligible students were identified by the physical education teacher at each school, parental consent form (Appendix A) was sent to the parents of eligible students through their weekly homework folders by the physical education teachers. A sample of 265 elementary school age students were first approached to be a part of this research project. These students were all in the 3rd and 4th grades and currently enrolled in the physical education classes at either Morgantown Elementary School or North Butler Elementary School. Of the 265 consent forms sent home, the principal investigator received 71 signed consent forms. All students participated in the asthma education activity, but only the information from the students whose parents signed the consent forms were used in the data analysis.

Measures and Instruments

The 'Asthma Knowledge Test' (Appendix C) was used as the pre-test and post-test form to measure the students' asthma knowledge. This tool was found through a data search on the CINAHL database through the University of Kentucky's library website. It was created by

Mohammad Al-Motlaq and Ken Sellick at Monash University, School of Nursing and Midwifery in Australia (Al-Motlaq and Sellick, 2011). Email consent was obtained by Mohammad Al-Motlaq to use the tool in this study. The Asthma Knowledge Test allowed the opportunity to obtain measurable information about the students' asthma knowledge prior to program implementation, as well knowledge gained from the program.

The Huff and Puff video series (Alexander, 2019; Appendix D) was used during the program implantation to describe basic information about asthma, asthma triggers, and asthma management. The Huff and Puff video series were created by Health Nut's Media, a medical information company that makes videos for different medical related events and campaigns. Consent to use these videos was obtained by the companies Chief Medical Officer, Dr. Gregg Alexander.

A supplemental PowerPoint presentation (Appendix E) was used to help reiterate main points from the Huff and Puff video series, as well as to further explain what is happening in the body during an asthma exacerbation demonstrating the potential danger of asthma to help further explain why asthma has the potential to be so dangerous in a way that 8-10-year-old children can understand. Information used in the presentation was obtained from the American Academy of Allergy, Asthma, and Immunology (2014), the Centers of Disease Control and Prevention (2019), and the National Asthma Education and Prevention Program's Asthma Basics for Schools campaign (NAEPP, 2008). See appendices C, D, and E.

Implementation

Project implementation began once IRB approval was obtained, parental consent forms were returned to the schools, and a schedule was reached between the PI and the physical education teachers at the enrolled schools. The program was conducted at North Butler Elementary school for the first 4 weeks, then the next 4 weeks the program was conducted at Morgantown Elementary school. One program day for Morgantown Elementary school had to be rescheduled due to snow days and other conflicts with the school schedule.

The asthma education program at North Butler Elementary was provided during the physical education class in the gym. Combined groups including one third grade class and one fourth grade class were scheduled together for the asthma program offering. The program was performed a total of 4 times to ensure program content was provided to all students. The program was performed a total of 4 times to present the program to all students. The program at

Morgantown Elementary was provided during the health education time that took place in different classrooms each day. The program was offered to each class independently for a total of 8 sessions to reach each of the third and fourth grade students. Each school session was scheduled was made to fit easily into each school's daily schedule with minimal disruptions.

Student assent was obtained at the beginning of each program offering. At the beginning of each session, the PI read the assent script to the students while the physical education teacher distributed the Asthma Knowledge pre-test forms. Each student then stated whether they would participate in program by watching the presentation and completing the Asthma Knowledge pre-test and post-test. Students that declined participation were moved to another part of the classroom and were provided supplemental schoolwork by the Physical Education teacher.

The Asthma Knowledge pre-test and post-test documents were printed front and back to conserve the amount of paper the schools had to use. The students circled the pretest or the post-test classification at the top of the paper depending on which document was being completed. The students were given approximately 10 minutes to complete the Asthma Knowledge pre-test.

Once all students had completed The Asthma Knowledge, the program began with an interactive dialogue about student's experience with asthma. The program continued with the introduction to asthma video from the Huff and Puff series. Following the introductory video, the PI presented a brief PowerPoint using information from the CDC's Asthma Basics for Schools program (NAEPP, 2008) to describe what happens in the body to cause the signs and symptoms of asthma. This PowerPoint presented a visual representation of the inflammation and increased mucous production in the airways of individuals with asthma. Following the descriptive presentation, students watched two additional Huff and Puff video describing the signs and symptoms of asthma and common asthma exacerbation triggers. Each Huff and Puff video lasted approximately 3 minutes. Following each video, the PI briefly discussed typical asthma management treatment before showing the last video describing rescue treatments versus maintenance medications. At the conclusion of the video series, the PI discussed what students should do if a student is exhibiting signs of an asthma exacerbation. The discussion focused on recognizing the signs of an exacerbation and finding a reliable adult close by to call 911, or to get the nurse. After class discussion, and to conclude the education component, students from each class volunteered to participate in a skit demonstrating how they could help a classmate having exacerbation symptoms. At the conclusion of program presentation, the PI left the room.

The Asthma Knowledge post-test was distributed by the physical education teacher. The physical education teacher separated the pre-test and post-tests documents for students who had parental consent for me to use of their child's responses from the students who did not have written consent. The pre-test and post-tests documents for the students who did not have parental consent were shredded on site. All sessions at both Morgantown Elementary School and North Butler Elementary School followed the same format and included the same information.

Results

A total of 265 students received the asthma education program content at their respective elementary schools. Parental consent to use data collected during the education program offering was received for 71 students enrolled in either elementary school. Demographic data was analyzed for frequencies (Table 1).

Data from the pre-tests and post-tests were analyzed for statistical significance using a paired t-test to compare the student's responses at two different moments in time (Goldstein, 2015). Success of the educational program was based upon whether the post-test scores were higher than the pre-test scores (Table 2). The average pre-test score was 15.2 out of a possible score of 25 (standard deviation 4.005). The average post-test score was 19.3 out of a possible score of 25 (standard deviation 2.630). Statistical significance was verified using a t-test with $p < 0.001$. Eighty percent of students had an increase in the post-test score compared to the pre-test score. Over 30% of students correctly identified three common signs and symptoms of an asthma exacerbation; 32% of students correctly identified two common signs and symptoms of an asthma exacerbation; 21% of students correctly identified one common sign or symptom of an asthma exacerbation. Only 15% of students either skipped this question or answered it incorrectly. Lastly, 87% of students answered what to do if a peer exhibits signs and symptoms of an asthma exacerbation correctly on the post-test.

Discussion

Asthma in children is a common health problem in children. Delayed treatment with an acute exacerbation can lead to tragic outcomes. School-based asthma programs historically have targeted teachers, school personnel, or children with asthma specifically. Having an age-appropriate, school-based asthma education program for all children can result in a positive and safer school experience for children with asthma. The study, Effectiveness of a School-based Asthma Education Program for 8-10-Year-Old Children, was effective in improving asthma

knowledge test scores in children with or without asthma, 8-10 years of age. Data analysis on almost 27% of the students who received the school-based asthma education showed a statistically significant improvement in The Asthma Knowledge Test scores following the program implementation. Nearly 85% of students were able to identify at least one common sign or symptom of an asthma exacerbation and more than 87% of students were able to correctly describe what to do if they witness a peer exhibiting signs or symptoms of an asthma exacerbation.

The sample group was homogenous (~96% identified Caucasian) and not diverse, yet consistent with the ethnic make-up of the community. It is unknown whether demographic information had an impact on the pre-test or post-test scores as student scores were not analyzed according to race/ethnicity, grade, or age. The pre-test scores were compared to the post-test scores overall. It would be very interesting to compare individual pre-test/post-test items to determine if there was a difference related to gender, race/ethnicity, or grade scores based upon academic level.

The location where the asthma education program was conducted could have influenced the scores as well. Classroom setting may have offered fewer distractions compared to the offering in the school gymnasium. The data were aggregate and were not analyzed between the schools.

Despite these potential influences on the Asthma Knowledge Test scores, overall, there was a statistically significant difference in post-test scores from the pre-test scores. This school-based asthma education program was effective in increasing overall asthma knowledge in children ages 8-10-years-old.

Implications for Practice, Education, Policy, and Future Research

Considering the statistical significance of the data results, this study shows that using the Huff and Puff Videos in addition to the PowerPoint information from the CDC's Asthma Basics for Schools program (NAEPP, 2008) presents adequate information to children ages 8-10 years old for them to have enough important information about asthma as a disease, as well as the signs and symptoms of asthma to know that it is a dangerous disease process that needs quick attention when a child presents with signs of an asthma attack.

The length of the educational activity could easily be incorporated into any elementary physical education or health class. Collaboration between the school nurse and the physical education teacher could also ease the implementation of the program. The information from the

PowerPoint is easily found and could easily be replicated by a physical education or health teacher in the future. This is a very important topic and implementing an educational activity such as this could improve the safety and school environment for the child with asthma.

In terms of future research, it would be interesting to see if just using the Huff and Puff video series would result in similar learning outcomes. It would also be interesting to evaluate the use of the Huff and Puff videos with newly diagnosed children with asthma to determine if its use helps them to adhere to their Asthma Action Plan and their medication regimen. Lastly, it would be interesting to compare and contrast the Huff and Puff videos to the Iggy and the Inhalers videos, which is another video series, created in 1993, used in many settings to teach children and their families about asthma treatment (Iggy and the Inhalers, 2020). Many useful research studies could be constructed using the Huff and Puff videos as the basis.

Limitations

Several limitations existed with this study. First, the study was only constructed at two different elementary schools, both of which were in the same town. This decreases the variety in demographics such as ethnicity, background, and previous exposures to the disease. Over 95% of the student population in the study identified as Caucasian. It would be interesting to determine if there were any differences in findings with a larger variety of ethnic backgrounds. Second, the location of the presentation was not consistent between the two schools. Unfortunately, this was unavoidable considering the differing schedules of both schools, but it could have greatly impacted the results and it will not be known if some students did not perform to the best of their abilities due to distractions in a gym setting. Lastly, only 27% of students eligible for enrollment in the study were able to be included in the data analysis. It would have been interesting to see if the results would have been different if all data could have been included in the analysis.

Conclusion

In conclusion, the purpose of this study was to evaluate the use of a school-based asthma education program in increasing overall asthma knowledge in elementary age students ages 8-10-years-old. The educational resources used in the program included Health Nuts Media's Huff and Puff series, as well as information from the CDC's Asthma Basics for Schools program (NAEPP, 2008). A pre-test and post-test known as the Asthma Knowledge Test for 8-10-year-olds was used to evaluate the students before the program and after. Pretest scores were compared to the posttest scores in order to reveal if the program increased the childrens' asthma knowledge.

Overall, the students scored higher on the posttests than the pretests indicating that the information from the videos and PowerPoint did increase their asthma knowledge. There was a statistically significant difference between pre-test and post-test Asthma Knowledge Test scores. More than 85% of the students were able to list at least one symptom of an asthma exacerbation and more than 87% of children were able to state what to do if witnessing a peer having symptoms of an asthma exacerbation. This study can be used to help schools collaboratively develop an asthma education program that could be incorporated into the school curriculum and implemented by the school nurse and teachers during the physical education and health classes. Through these collaborative efforts it is the hope that programs such as this will help students to quickly recognize the signs and symptoms of an acute asthma exacerbation of a peer and get them the help needed as quickly. Increasing awareness of the dangers of asthma in those without asthma can only help children with asthma be healthier and safe at school.

References

- Ahmad, E., & Grimes, D. (2011). The effects of self-management education for school-age children on asthma morbidity: A systematic review. *The Journal of School Nursing*, 27(4), 282-292.
- Al-Motlaq, M., & Sellick, K. (2011). Development and validation of an asthma knowledge test for children 8-10 years of age. *Child: Care, Health & Development*, 37(1), 123–128.
<https://doi-org.ezproxy.uky.edu/10.1111/j.1365-2214.2010.01133.x>
- American Academy of Allergy, Asthma, and Immunology. (2019). Pediatric asthma definition. AAAAI. Retrieved from: <https://www.aaaai.org/conditions-and-treatments/conditions-dictionary/pediatric-asthma>
- American College of Allergy, Asthma, and Immunology. (2014). Asthma attacks. ACAAI Retrieved from: <https://acaai.org/asthma/symptoms/asthma-attack>
- American Lung Association. (2018). Practical guidance for schools and school districts to protect student lung health. Retrieved from:
<https://www.lung.org/assets/documents/asthma/practical-guidance.pdf>
- Asthma awareness month. (2017). *Kentucky Cabinet for Health and Family Services (CHFS)*. Retrieved from: http://chfs.ky.gov/NR/rdonlyres/B0C9DBA7-AB27-43AD-A794-B82B665FFB12/0/Asthma_Proclamation_5162017.pdfLinks to an external site.
- Carpenter, D. M., Lee, C., Blalock, S.J., Weaver, M., Reuland, D., Coyne-Beasley, T., Mooneyham, R., Loughlin, C., Geryk L.L., & B. L., Sleath (2015). Using videos to teach children inhaler technique: a pilot randomized controlled trial, *Journal of Asthma*, 52:1, 81-87, DOI: [10.3109/02770903.2014.944983](https://doi.org/10.3109/02770903.2014.944983)
- CDC. (2013). Asthma-related missed school days among children aged 5–17 years. *U.S. Department of Health and Human Services*. Retrieved from:
https://www.cdc.gov/asthma/asthma_stats/missing_days.htm
- CDC. (n.d.). Asthma. Centers of Disease Control and Prevention. Retrieved from:
<https://www.cdc.gov/asthma/schools.html>
- CDC. (2019). CDC healthy schools: asthma. Centers of Disease Control and Prevention. Retrieved from: <https://www.cdc.gov/HealthySchools/asthma/index.htm>
- CDC. (2017). National center for health statistics: asthma. *U.S. Department of Health and Human Services*. Retrieved from: <https://www.cdc.gov/nchs/fastats/asthma.htm>

- Chini, L., Iannini, R., Chianca, M., Corrente, S., Graziani, S., La Rocca, M., . . . Moschese, V. (2011). Happy air®, a successful school-based asthma educational and interventional program for primary school children. *Journal of Asthma.*, 48(4), 419-426.
- CHSF. (2016). 2016 Kentucky state plan for addressing asthma. Retrieved from: <https://chfs.ky.gov/agencies/dph/dpqi/cdpb/Documents/2016KentuckyStatePlanforAddressingAsthmarevised.pdf>
- Coffman J.M, Cabana M.D., Halpin H.A., & Yelin E.H. (2008). Effects of asthma education on children's use of acute care services: a meta-analysis. *Pediatrics*;121 (3):575– 586
- Comprehensive district improvement plan. (2016). *Butler County School Board*. Retrieved from: <http://www.butlerschools.net/docs/district/2016-17%20cdip.pdf?id=10747>
- Eaton, S. (2012). Addressing the effects of missing school for children with medical needs. *Pediatric Nursing*, 38(5), 271-277.
- Goldstein, E. (2015). Choosing a statistical test. Retrieved from: <https://www.youtube.com/watch?v=UaptUhOushw&feature=youtu.be>
- Health Nut Media. (2018). Huff & puff: an asthma tale. Retrieved from: <https://healthnutsmedia.com/huff-puff/>
- Horner, S. D. (2016). Enhancing Asthma Self-Management in Rural School-Aged Children: A Randomized Controlled Trial. *The Journal of Rural Health : Official Journal of the American Rural Health Association and the National Rural Health Care Association.*, 32(3), 260-268.
- Iggy and the inhalers. (2020). Iggy and the inhalers. Retrieved from: <https://iggyandtheinhalers.com/>
- Kintner, E. (2015). Comparative Effectiveness on Cognitive Asthma Outcomes of the SHARP Academic Asthma Health Education and Counseling Program and a Non-Academic Program. *Research in Nursing & Health.*, 38(6), 423-435.
- Levy M. (2006). The efficacy of asthma case management in an urban school district in reducing school absences and hospitalizations for asthma. *The Journal of School Health.*, 76(6), 320-324.
- [Liptzin, D.R.](#), [Gleason M.C.](#), [Cicutto L.C.](#), [Cleveland C.L.](#), [Shocks D.J.](#), [White M.K.](#), [Faino A.V.](#), [Szeffler S.J.](#)(2016). Developing, implementing, and evaluating a school-Centered

- asthma program: step-up asthma program. *The Journal of Allergy and Clinical Immunology. In Practice.*, 4(5).
- Melnyk, B., & Findholt-Overholt, E. (2015). *Evidence-based Practice in Nursing and Healthcare: A Guide to Best Practice*, (3rd ed.). Philadelphia, PA: Wolters Kluwer.
- Mickel, C. F., Shanovich, K. K., Evans, M. D., & Jackson, D. J. (2017). Evaluation of a School-Based Asthma Education Protocol: Iggy and the Inhalers. *Journal of School Nursing*, 33(3), 189–197. <https://doi-org.ezproxy.uky.edu/10.1177/1059840516659912>
- Mosnaim, G.S. (2011). Evaluation of the Fight Asthma Now (FAN) program to improve asthma knowledge in urban youth and teenagers. *Annals of Allergy, Asthma, & Immunology.*, 107(4), 310-316.
- NAEPP. (2008). Asthma basics for schools parts 1 and 2. *CDC. U.S. Department of Health and Human Services*. Retrieved from: <https://www.cdc.gov/healthyschools/asthma/creatingafs/index.htm>
- Nazario, A. A. N. (2018). Asthma triggers. Retrieved from: <https://kidshealth.org/en/parents/asthma-triggers.html>
- University of Kentucky Office of Research Integrity. (n.d.). IRB review types. *University of Kentucky*. Retrieved from: <https://www.research.uky.edu/office-research-integrity/irb-review-types>
- Vasishtha, S., Hull, A., Ignoffo, S., Henry-Tanner, J., Chisum, G., Dominguez, P., & Volerman, A. (2018). Impact of a novel asthma curriculum on knowledge and attitudes among school children. *Pediatrics*. 142 (741) DOI:10.1542/peds.142.1_MeetingAbstract.741
- Whole school, whole community, whole child: a collaborative approach to learning and health (2014). *CDC and ASCD*. Retrieved from: https://www.cdc.gov/healthyschools/wsc/WSCCmodel_update_508ta

Appendices

Appendix A: Parental Informed Consent



Combined Parental Permission/Consent to Participate in a Research Study

KEY INFORMATION FOR ASTHAM EDUCATION 8-10 YEAR OLDS:

When we say “you” in this form, we are referring to you and your child; “we” refers to the researchers and their staff. We are asking you to choose whether or not to allow your child to volunteer for a research study about Asthma. We are asking you because we are conducting a study to test the use of an asthma education program for children ages 8-10 years old and your child is in this age range. This page is to give you key information to help you decide whether to participate. We have included detailed information after this page. Ask the research team questions. If you have questions later, the contact information for the research investigator in charge of the study is below.

WHAT IS THE STUDY ABOUT AND HOW LONG WILL IT LAST?

The purpose of this study is to increase asthma knowledge and awareness in children ages 8-10 years old. During the study the students will watch 4 fun, educational videos using the characters of the Three Little Pigs to explain what asthma is and provides a brief description of how it is treated during their physical educational class. The students will also get to participate in a short skit activity to further explain signs and symptoms. By doing this study, we hope to learn if this educational program using the videos will increase asthma knowledge in this age group, as well as hopefully help these children feel more comfortable to help if an asthma emergency happens with one of their peers. Your child’s participation in this research will only be for one day of their scheduled physical education class. The entire study will last from September 2019 to May 2020.

WHAT ARE KEY REASONS YOU MIGHT CHOOSE TO VOLUNTEER FOR THIS STUDY? The most important reason you might choose to allow your child to volunteer for this study is that they can learn a lot about a very common chronic disease that affects many children their age. As part of the educational program, we go over what to do if your friend starts having an asthma attack. This is a very good opportunity for the students to learn their part in helping their friends with asthma.

WHAT ARE KEY REASONS YOU MIGHT CHOOSE NOT TO VOLUNTEER FOR THIS STUDY?

The study does pose some risks. For example, the students will be participating in a couple interactive activities where they will be acting out an asthma attack and what to do (the what to do is just find a trustworthy adult to get the students medication or call 911). However, this activity does not pose any greater risk to their health than any other physical activity they would otherwise be participating in during PE class. Another risk is associated with their personal information. The only personal information used

for the study will be the students age, gender, and asthma diagnosis status. This personal information will be protected. The students' names will not be used, instead a number will be associated with their information. The information will also be kept in a locked drawer during the length of the program, and then afterwards will be shredded.

DO YOU HAVE TO TAKE PART IN THE STUDY?

If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any services, benefits or rights you would normally have if you choose not to volunteer. As a student, if your child decides not to take part in this study, his or her choice will have no effect on his or her academic status or class grade(s).

WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS OR CONCERNS?

If you have questions, suggestions, or concerns regarding this study or you want to withdraw from the study contact Laura Hunt, BSN, RN, DNP-student of the University of Kentucky, Department of Nursing at (270) 5320786 or laura.hunt@uky.edu. If you have any concerns or questions about your rights as a volunteer in this research, contact staff in the University of Kentucky (UK) Office of Research Integrity (ORI) between the business hours of 8am and 5pm EST, Monday-Friday at 859-257-9428 or toll free at 1-866-400-9428.

DETAILED CONSENT:

WHERE WILL THE STUDY TAKE PLACE AND WHAT IS THE TOTAL AMOUNT OF TIME INVOLVED?

The research procedures will be conducted at Morgantown Elementary School or North Butler Elementary School. Your child will need to come one time during the study. The program will take about 30-45 minutes.

WHAT WILL YOU BE ASKED TO DO?

The student will be asked to agree to participate in the program before each meeting. Then the student will be asked to fill out a questionnaire about his or her current knowledge about asthma, as well as state his or her age, gender, and if he or she has a diagnosis of asthma. After answering the questionnaire, the primary investigator will introduce asthma and provide a definition of what it is and what it causes in the body. Then the students will watch a series of four videos using the characters of The Three Little Pigs to explain the signs and symptoms and treatments for asthma. Each video lasts approximately three to four minutes a piece. After the videos are finished, the students will participate in an activity where they have to breath through a straw to simulate how it feels to breathe when having an asthma attack. The last activity the students will participate in is a skit activity where volunteers act out a student having an

asthma attack and his or her friends acting out finding an adult to help. The adult will act out giving the child medication or calling emergency services. 911 will not actually be called and medication will not actually be given. This activity is just to show the children what they can do to help if they are ever with a peer that has an asthma attack. The only part that will be used in the research will be the results of the pretest and the post-tests.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

There is no drug, biologic, device, or procedure involved in this study. The study does involve an educational activity involving breathing through straws to imitate how difficult it is to breath during an asthma exacerbation. Although rare, this activity could potentially cause harm to a child if the child has undiagnosed lung problems. To minimize risk for the children during this activity, each child will do it one at a time and monitored by the PI closely. Another risk is the risk of breach of confidentiality. However, the pretest and the post-test do not have specific private information other than gender and age. To decrease the risk of breach of confidentiality, all pretests and post-tests, as well as the master key with names and numbers, will be safely locked in separate cabinets that only the PI will have access to. There is always a chance that any medical treatment can harm you. The research treatments/procedures in this study are no different. In addition to risks described in this consent, you may experience a previously unknown risk or side effect.

WILL YOU BENEFIT FROM TAKING PART IN THIS STUDY?

We do not know if you will get any benefit from taking part in this study. However, if you take part in this study, information learned may help others with asthma.

IF YOU DON'T WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?

If you do not want to allow your child to take part in the study, there are other choices such as an alternative activity chosen by the PE teacher.

WHAT WILL IT COST YOU TO PARTICIPATE?

There is no cost to participate in this research.

WHO WILL SEE THE INFORMATION THAT YOU GIVE?

When we write about or share the results from the study, we will write about the combined information. We will keep the names and other identifying information private. We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what that information is. Confidentiality is provided by keeping all information in a locked filing cabinet, all computer information will be kept on an encrypted and password protected laptop. All information will be destroyed

after the study is finished. To ensure the study is conducted properly, officials of the University of Kentucky may look at or copy portions of records that would identify you.

CAN YOU CHOOSE TO WITHDRAW FROM THE STUDY EARLY?

You can choose to leave the study at any time. You will not be treated differently if you decide to stop taking part in the study. If you choose to leave the study early, data collected until that point will remain in the study database and may not be removed. The investigators conducting the study may need to remove you from the study. You may be removed from the study if:

- you are not able to follow the directions,
- we find that your participation in the study is more risk than benefit to you

ARE YOU PARTICIPATING, OR CAN YOU PARTICIPATE, IN ANOTHER RESEARCH STUDY AT THE SAME TIME AS PARTICIPATING IN THIS ONE?

You may take part in this study if you are currently involved in another research study.

WILL YOU RECEIVE ANY REWARDS FOR TAKING PART IN THIS STUDY?

You will not receive rewards for taking part in this study.

WHAT IF NEW INFORMATION IS LEARNED DURING THE STUDY THAT MIGHT AFFECT YOUR DECISION TO PARTICIPATE?

We will tell you if we learn new information that could change your mind about staying in the study. We may ask you to sign a new consent form if the information is provided to you after you have joined the study.

WHAT ELSE DO YOU NEED TO KNOW?

If you volunteer to take part in this study, you will be one of about 300 people to do so.

The Primary Investigator of this study is a doctoral student. She is being guided in this research by Dr. Leslie Scott, DNP, PCP. There may be other people on the research team assisting at different times during the study.

WILL YOUR INFORMATION BE USED FOR FUTURE RESEARCH?

Your information collected for this study will NOT be used or shared for future research studies, even if we remove the identifiable information like your name, medical record number, or date of birth.

FORMED CONSENT SIGNATURES

This consent includes the following:

- Key Information Page
- Detailed Consent

You will receive a copy of this consent form after it has been signed.

Signature of research subject or, if applicable,

Date

*research subject's legal representative

Printed name of research subject

Printed name of [authorized] person obtaining informed consent

Date

Appendix B: ASSENT SCRIPT

You are invited to be in a research study being done by Laura Hunt from the University of Kentucky. Research studies are done when doctors want to find new ways of treating patients. You are invited because you are an elementary school student between the ages 8-10 years old.

If you are in the study, you will participate in an educational program about asthma today during your PE class. The study is only happening today. You will not have to do anything for this study after this class.

Your family will know that you are in the study. If anyone else is given information about you, they will not know your name. A number will be used instead of your name.

There is no payment with this study.

If something makes you feel bad while you are in the study, please tell Laura, your teacher, or your parent. If you decide at any time you do not want to finish the study, you may stop whenever you want.

You can ask Laura questions any time about anything in this study. You can also ask your parent(s) any questions you might have about the study.

Saying you want to participate in this program means that you have read this or had it read to you and that you want to be in the study. If you do not want to be in the study, tell Laura. Being in the study is up to you, and no one will be mad if you do not sign this paper or even if you change your mind later. You will not get a grade for participating in this program. You agree that you have been told about this study, why it is being done, and what to do.

Appendix C: Asthma Knowledge Pre/Post-Test for ages 8-10-years-old

Directions: Please write True or False by each statement. For numbers 24 and 25, please write out your answer.

1. Lots of children have asthma
2. People with asthma worry a lot
3. People with asthma can drink milk and eat yogurt
4. Having the flu can cause an asthma attack
5. Smoking is OK for people with asthma
6. People with asthma become hooked on their asthma drugs (cannot get off them)
7. If you do not have asthma now, you will never get it
8. An asthma attack is caused by redness and swelling in the airways of the lung
9. Most children with asthma are smaller than other children
10. Asthma can be spread from person to person
11. If one child in a family has asthma, then their brothers and sisters will have asthma too
12. People with asthma can die if not treated well
13. Medicines that keep asthma from happening should be taken every day
14. A puffer (inhaler) should be used when a person has an asthma attack
15. Having pet birds is OK for people with asthma
16. Asthma happens more at night
17. It is OK for people with asthma to swim
18. Some asthma medicines can hurt the heart
19. Rest is needed to stop an asthma attack
20. An asthma attack can happen suddenly without warning
21. When asthma is OK, all medicines can be stopped
22. With the right treatment, a child with asthma can live a normal life
23. Children with asthma can play sport
24. Can you list three signs of asthma?
25. What would you do if you saw a classmate start to have an asthma attack?

Total score

Appendix D: Video Link to Huff and Puff Videos

<https://healthnutsmedia.com/ukasthma/>

Appendix E: What is Asthma? PowerPoint



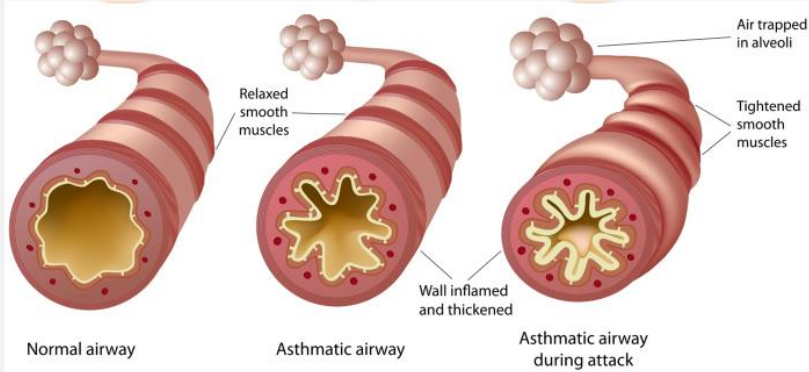
Long-term health problem
No reason why it happens is known
No cure has been found
Very dangerous when it “flares up”
Cannot give it to anyone or get it from anyone

WHAT HAPPENS
IN THE BODY

Airway is irritated by a “trigger” in the environment

Airway swells

Airway makes fluid called mucous



Asthma

Symptoms

- Labored breathing
- Wheezing
- Sleep problems
- Chest pain
- Frequent coughing
- Allergies
- Common cold
- Feeleng tired

Causes and triggers

- Pollution
- Smoking
- Household chemicals
- Genetic
- Fatty food
- Dust
- Pets
- Bacteria and viruses

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WHAT TO DO IF YOUR FRIEND HAS AN ASTHMA ATTACK



Stay with your friend



Call or yell for help from an adult



If your friend has medications with
him/her, hand him or her the inhaler



Adult with call for emergency care

REFERENCES

- American Academy of Allergy, Asthma, and Immunology. (2019). Pediatric asthma definition. AAAAI. Retrieved from: <https://www.aaaai.org/conditions-and-treatments/conditions-dictionary/pediatric-asthma>
- CDC. (n.d.). Asthma. Centers of Disease Control and Prevention. Retrieved from: <https://www.cdc.gov/asthma/schools.html>
- NAEPP. (2008). Asthma basics for schools parts 1 and 2. CDC. U.S. Department of Health and Human Services. Retrieved from: <https://www.cdc.gov/healthyschools/asthma/creatingafs/index.htm>

Tables

Table 1: Student Demographics

Demographic	Number	Percentage
Male	38	54%
Female	33	46%
Caucasian	68	96%
Hispanic	3	4%

Table 2: Asthma Knowledge Test T-Test Results

	Pre-test <i>Mean (SD)</i>	Post-test <i>Mean (SD)</i>	<i>p</i>
Score	15.2 (4.005)	19.3 (2.630)	p<.001