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Addressing Pediatric Asthma in Northern Colorado

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Abstract

Addressing Pediatric Asthma in Northern Colorado: Increase Knowledge Related to Pediatric Asthma

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Research Question: The question for this project is two-fold. Will the participants in the study gain increased knowledge about management of pediatric asthma and will the participants gain confidence in their ability to recognize asthma symptoms and respond appropriately? **Purpose**: The purpose of this project was to explore the impact of an educational intervention for parents and caretakers of children with asthma which includes the use of a low fidelity manikin simulation session on the outcomes of the families who participate in the project. **Methods:** The project was a quasi-experimental pre-test post-test quantitative design conducted at a church in Northern Colorado with parents and care takers utilizing a simulation educational modality. The primary outcome measures for the project included results of the pre-test post-test comparison and demonstration of skills utilizing a low fidelity manikin. **Outcomes and Results**: The paired samples t-test revealed statistical significance supporting that the educational intervention increased the knowledge base of the participant as measured by the comparison of the aggregate scores of the pre-test to the post-test, $t\ (-3.651)$, $p<0.022$. This project provides a framework for future studies involving the use of technology based educational offerings with parents and caretakers. Enhanced health knowledge should provide better child health management.

Keywords: Asthma, pediatric asthma, asthma flare ups, simulation education for the lay public

Executive Summary

Comparisons of pre-test and post-test results were used to determine the effectiveness of an educational intervention for parents and caretakers of children with asthma following a simulation experience.

Problem

According to the Center for Disease Control (CDC) as of 2015 there were 6.3 million children diagnosed with asthma with 9.8% of those between the ages of five and 14 years of age ("Asthma's impact on the nation," 2017). This data suggests that 47.5% of this population had one or more asthma flare ups with 18.3% of this resulting in a hospital stay and 3% resulted in death. Asthma flare ups are costly not only in reference to resources utilized and lives lost but they are also preventable.

Purpose

Based on this identified problem, the PICO (P, population, I, intervention, C, comparison, O, outcome) question served to focus the Capstone Project to improve outcomes in the parents' asthma knowledge in order to improve the patients' health status and promote future healthy behaviors utilizing education sessions and simulation.

Goals

The goals of the project were to see immediate evidence of increased knowledge in parents and caretakers. The long-term goal is not within the scope of the current project.

Objectives

The outcomes objectives were demonstrated increase in knowledge related to asthma, and how to maintain a healthy home by the parents who attended the interventional education program.

Plan

The project was a quasi-experimental pre-test post-test quantitative design. The primary outcome measures for the project included better understanding of asthma symptom and treatment and demonstration of skills utilizing a low fidelity manikin.

Outcomes and Results

The paired samples t-test revealed there was a significantly higher average knowledge score on the post-test than the pre-test, $t=-3.651$, $p<0.022$. This project provides a framework for future studies involving the use of low fidelity manikin technology based educational offerings for parents and caretakers.

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The purpose of this project was to explore the impact of an educational intervention for parents and caretakers of children with asthma including the use of a low fidelity manikin simulation session on the outcomes of the families who participated in the project. Undermanaged asthma results in an increase of utilization of the healthcare system, missed days of school, and missed days of work for the parent to tend to their ill child. The hypothesis for this study was that with increased knowledge about asthma on the part of the parent through the education provided and the increased confidence level of the parent through use of simulation there would have a positive outcome for the child with asthma. By working through the various simulation scenarios (3), the parent would experience how serious an asthma flare-up can be and thus be more motivated to provide a healthy home and advocate for healthy schools.

Problem Recognition and Definition

Asthma is a leading chronic illness for children in the United States (U.S.), and asthma flare ups are a burden on the medical system, school systems, and workforce (Asthmas impact on the nation, 2017). Asthma in this population has historically been undermanaged with an identified issue of excessive emergency department visits for asthma flare ups (T.Unrein, FNP, RN, personal communication, February 3, 2014). With changes in health care it is imperative the health care systems provide interventions to greatly reduce the use of the emergency departments and assist patients and families in managing their health care needs. A market analysis revealed there were no such offerings in the area that include the use of simulation in their education of pediatric asthma thus there is a gap in the literature.

Asthma is a chronic respiratory disease that impacts both the health and the economics of societies worldwide ("Global strategy," 2017). Asthma is a disease that has been around for many centuries, Egyptian Ebers Papyrus were found in the 1870’s containing hieroglyphics

depicting prescriptions for the treatment of asthma ("Global strategy," 2017). Asthma remains today one of the leading health care concerns globally for children ("Healthy People 2020," 2017). Although some countries have experienced a decline in hospitalization and deaths related to asthma there has been an increase in the prevalence of the disease in many other countries ("Global strategy," 2017). The impact on the health of the asthmatic as well as the impact on the economy related to increased health care costs as seen by emergency department visits, hospitalizations, unscheduled provider visits, and the impact on society related to missed days of school as well as the parents missed days of work to stay home with a sick child related to asthma flare ups must be addressed.

Children are among our most vulnerable of all populations, they depend on adults to meet their needs and to protect them, according to the Centers for Disease Control (CDC). Asthma is the leading cause of school absenteeism in the United States. Nearly one in two children miss at least one day of school each year because of asthma ("Asthma's impact on the nation," 2014). The statistics are staggering when one considers that asthma costs the U.S. an estimated $56 billion in direct healthcare costs annually ("Global strategy," 2017).

According to Brozek, Farnik, Lawson, and Zejda, (2013), asthma is under diagnosed often times referred to as reactive airway disease or not diagnosed at all. Asthma can be very difficult to diagnose, as many as 80% of children with asthma present with symptoms before the age of five (Brozek, Farnik, Lawson, & Zejda, 2013). Studies indicate the importance of the promising outcomes of implementing an asthma program within the school systems, (Green, Wendland, Carver, Rinker, & Mun, 2012; "Open Airways"; "Respiratory disease," 2014). Utilizing an asthma action plan, an individualized management plan for any person with asthma formulated by their primary care provider, providing education to the students, their parents,

teachers, school bus drivers, and teacher's aides are an important element in assuring the success of an asthma program. This project author hoped to identify the barriers related to proper management of pediatric asthma flare ups amongst the study population.

Population, Intervention, Compare, Outcome (PICO)

PICO is an acronym utilized in formulating a patient-centered question, "what is the *P*atient, *P*opulation, or *P*roblem? Which *I*ntervention is being considered? What *C*omparator is this intervention will be used? What *O*utcome will be measured?" (PICO, 2014). The PICO for this project is delineated in Table I.

Table I PICO

Addressing Pediatric Asthma in Northern Colorado PICO	
P	Parents and caretakers of children ages five-12 years with an active diagnosis of asthma in Northern CO
I	Educational workshop to address the topics of what is asthma, triggers of asthma, appropriate treatment and management of asthma, how to maintain a healthy home and how to advocate for a healthy school environment. Use of a low fidelity manikin for simulation training will be utilized for a randomly selected group within the sample population
C	Outcome results will determined by comparison of pre/post-test results and observed demonstration of skills on a low fidelity simulation manikin
O	Anticipated outcomes include demonstrated increase in knowledge related to pediatric asthma

The PICO question for this project was two-fold. Will the participants in this study gain knowledge about management of pediatric asthma and will the participants gain confidence in their ability to recognize asthma symptoms and appropriately respond?

Project Significance

The impact on society by asthma not only from a financial aspect but also from a loss of life drove this study project. The effects of environmental factors (triggers) on asthma flare-ups are a theme utilized in the development of the project's educational content. The significance of

the project to explore the impact of an educational intervention that includes simulation for the lay public could be a catalyst for future course offerings and improved pediatric asthma recognition, treatment, and control. This project could be used to encourage parents to lobby for schools to offer such a class for the staff who care for children with asthma.

Theoretical Foundation

For this project three theories were utilized, nurse theorist Imogene King's Goal Attainment Theory (1981), Bandura's self-efficacy theory (1997), and Knowles theory of adult learning.

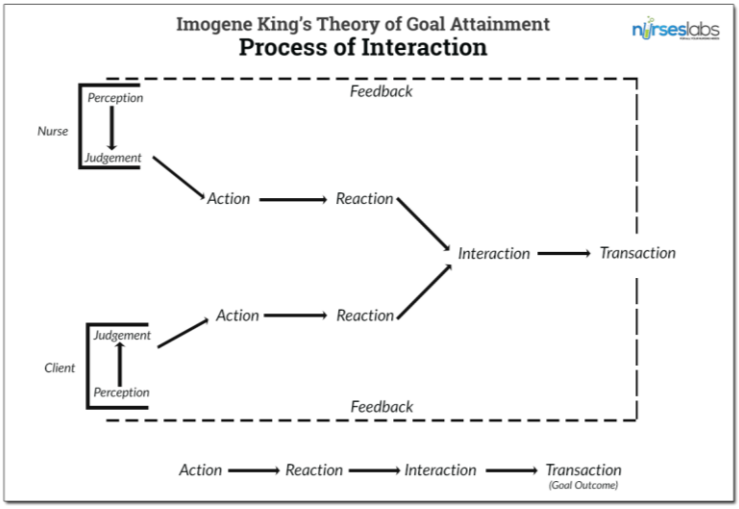
Goal Attainment

Imogene King's Goal Attainment Theory (1981) is a mid-range theory that focuses on the patient's desired outcomes (Alligood & Tomey, 2010). Based on this theory it is imperative to establish a nurse-patient relationship assessing the patients concerns as well as their desired health outcomes. This project sought parents of children with asthma who volunteered to participate in an educational intervention. One can argue the participants are motivated to learn and to make changes for a positive health outcome for their child by agreeing to participate in the study project. The nurse-patient relationship is one of sharing information, mutual goal setting and developing tools to successfully obtain those goals. Figure I illustrates a process of human interactions that lead to transactions (Alligood & Tomey, 2010, p 291).

This theory was selected to provide guidance on goal attainment, the goal being increased knowledge of pediatric asthma for the parents who participated. This theory assisted the investigator to acknowledge any preconceived perceptions while formulating the measurement tools. The investigator was able to establish trust with the participants based on her previous role

as a neonatal/pediatric flight nurse with extensive experience caring for children having life threatening asthma flare ups and her role as a simulation specialist.

Figure I. Goal Attainment



Self-Efficacy Theory

Bandura's self-efficacy theory (1997) derived from social learning theory provides a foundation for this study project. Bandura proposes that two types of expectations influence behavior: outcome expectations and self-efficacy expectations (Kasikci, 2010). Outcome expectations are a person's belief that certain behaviors will result in certain outcomes whereas the self-efficacy expectations are the person's confidence to carry out specific behaviors. The stronger the individuals perceived self-efficacy expectations the better the results. This theory was helpful in relation to the use of simulation to demonstrate the skills learned in the class.

Adult Learning Theory

Knowles theory of adult learning, revised in 1984 from his original work in 1968 called andragogy meaning "the art and science of helping adults learn" (Clapper, 2010, pg. e7). After receiving criticism for assuming all adults learn the same while ignoring systems of oppression and the effects of culture he revised his theory to address motivation as a form of internal

discipline, (Clapper, 2010). The theory of adult learning was the inspiration to include simulation as a portion of the course. This investigator utilized auditory, visual, and tactical learning techniques to provide the participants a variety of learning modalities.

Utilizing a combination of these theories as the framework addressed the needs of the adult learner, what motivated them to learn, what motivated them to make changes in their homes and lifestyles to improve the health of their child. Providing the participants the ability to respond to various simulation scenarios to replicate as close as possible an asthma flare up and how their responses affected the outcome for the simulated child increased the participant's motivation to avoid an asthma flare up for their child.

Literature Review

Search engines utilized were Google Scholar and PubMed. The initial time frame was from 2000 to 2015 later adding to 2017. The key words asthma, pediatric asthma, simulation in healthcare, simulation with lay public, environment and asthma, and patient centered medical home (PCMH) model were utilized. Table II illustrates the results from the search engines for the indicated keywords.

Table II Literature Review

Keywords	Google Scholar	PubMed
Asthma	1,840,000	147,309
Pediatric Asthma	530,000	12,892
Simulation in healthcare	135,000	13,362
Simulation with lay public	0	0
Environment and asthma	795,000	7,564
PCMH	6,600	434

Research in Nursing	1,790,000	163,311

Google Scholar provided the majority of articles for review. Any articles that reflected information on the impact of pediatric asthma, environmental factors that impact asthma, the PCMH group visit model, and simulation were reviewed. Articles were narrowed to 45 based on the level of evidence and study design relevancy to the PICO question using the seven tiered levels of evidence from Houser and Oman (2011), illustrated in table III. According to Oman lower forms of evidence may be useful when the clinical decision carries less of a risk, (Houser, 2011).

Table III Levels of Evidence

Level of Evidence	Number of articles
I	4
II	2
III	0
IV	2
V	1
VI	1
VII	35

The literature review provided basic information on asthma and the impact asthma has on our nation (American Lung Association, 2012; Asthma, 2017; Asthma's impact on the nation, 2017; CDC, 2014; Global initiative for asthma, 2017; Healthy people 2020, 2017; Indiana Chronic Disease Management Program, 2013; Jones & Bartlett, 2012; Ortiz, 2008). This

information provided a foundation to identify the problem. Asthma literature was drilled down to focus on pediatric asthma which included the following articles (Allergy & Asthma Network, 2011; Brozek et al, 2013; CDC, 2014, 2017; Chen et al, 2004; Cicutto et al, 2013; Clark et al, 2009; Clevelan, 2007; Colorado Department Public Health and Environment, 2014; Hester et al, 2013; Jones & Wheeler, 2004; Navaie-Waliser, 2004; Oermann et al, 2003; Open airways for schools, 2014; Portwood & Nelson, 2012; Rodriguez et al, 2012; Toelle et al, 2000; Turcotte et al, 2014). The information gleaned from these articles helped to identify the need for asthma education for parents and caretakers of children with asthma plus the content formulation for the course created and presented. The literature search yielded no articles related to using simulation for the lay public. Articles were reviewed in reference to the use of simulation in healthcare (Dunnington, 2013; Foss, 2011; Gaba, 2013; Kantz et al, 2010; Kuehster, Hall, 2010; Palaganas et al, 2014; Simington, 2011). Review of these articles assisted in formulating meaningful simulation scenarios to enhance the learning experience at the same time avoiding excessive stress levels for the participants. Articles were reviewed in reference to the group visit model of the Patient Centered Medical Home (PCMH) format (Banner Health, 2014; Delivery System Reform, 2014; Green et al, 2012; PCMH, 2011; Radzyminski, 2014). After reviewing of the literature on asthma it was identified that environmental factors impact asthma flare ups, this investigator reviewed articles to identify environmental implications for Northern Colorado (Haveman-Niles, 2005; Knowlton, 2015; Lopez et al, 2001; Resnik, 2006). Review of these articles assisted the investigator during the creation of the course content to address specific environmental factors specific to Norther Colorado such as smog pollution, pollen content and the effects of wildfires and flooding.

With healthcare changes and the focus shifting from pay for service to pay for performance the healthcare industry must find ways to provide preventative measures to become successful at keeping patients out of the emergency rooms and hospitals and assist them in becoming active and engaged participants in their healthcare needs. This project was a combination of education and hands on application of skills learned with the use of a low fidelity simulation manikin supported by the current literature.

Market Analysis

A market analysis was conducted by first completing an analysis of the ***P***olitical, ***E***nvironmental, ***S***ocial and ***T***echnology (PEST analysis, Table IV) of Northern Colorado in reference to influences on asthma intervention. Findings from the PEST analysis revealed a need for intervention related to pediatric asthma, (table IV).

Political influences primarily centered on the Affordable Care Act (Anderson, 2014). The health care crisis and lack of adequate or equitable health care insurance coverage as well as limited and unequal access to health care forced this agenda. The transition from pay for service to pay for performance continues to be a challenge for the health care industry ("Delivery system reform," 2017). School systems are stretched and most share one Registered Nurse (RN) for multiple school sites. Teachers, coaches, school bus drivers etc. do not receive training on how to respond to an asthma flare up ("Open airways," 2017).

Environmental factors play a large role in triggering asthma flares ups for example pollution and allergens as well as changes in temperature (Climate, 2017). There are 13 counties in the state of Colorado that have ragweed pollution and five counties in Colorado have unhealthy smog pollution, increased carbon dioxide levels cause plants to produce more pollen (Knowlton, 2015). One county in Northern Colorado where this study was conducted had both

of these risk factors (Climate, 2017). Changing climate has resulted in higher temperatures which worsen smog pollution along with the drier climate of Colorado there is an increased risk of wildfires which adds to smoke pollution to the mix (Climate, 2017) .

The social implications of unmanaged asthma have a direct impact on the financials of a health care system related to costly emergency room visits, increased hospitalizations and insurance dollars spent. Other factors include missed days of school for the child with asthma flare ups, resulting in a lag in their educational process, lost federal dollars to the schools related to school absenteeism, and increased risk potential for bullying of these children ("Open airways," 2017). Parents who must miss work to stay home with a sick child have a direct impact on the United States (U.S.) workforce thus costing millions of dollars each year ("Asthma's impact on the nation," 2017).

African Americans are at greater risk of acquiring asthma, Caucasians are next, mixed races and then Hispanics ("Asthma's impact on the nation," 2017). As children boys have a higher incidence of acquiring asthma while in the adult population it is females who develop asthma more than males ("Asthma's impact on the nation," 2017).

Studies indicated the use of simulation enhances the learning process, a market analysis of asthma education offerings in Northern Colorado at the time of this study project did not include simulation. The successful utilization of simulation training has been utilized by the aviation industry and the military for decades is clearly documented (Palaganas, Epps, & Raemer, 2014). We now see it becoming more common in healthcare education not only in schools of medicine and nursing but also in aiding the training and education of healthcare professionals in the hospital settings. This new technology increased positive patient outcomes

(Simington, 2011). Simulation as an educational tool for the lay public with the exception of manikins used in Basic Life Support courses are lacking in the literature creating a gap in the literature.

Table IV PEST Analysis

Addressing Pediatric Asthma in Northern Colorado PEST Analysis	
Political • The Affordable Care Act • Health care crisis • Lack of adequate or equitable health care insurance coverage • Limited and unequal access to health care • Transition from pay for service to pay for performance (Anderson, 2014) • Migration towards the Patient Centered Medical Home model of care their own health care to improve or maintain their desired state of health. • One RN school nurse to cover multiple sites	**Social** • Financial impact; healthcare costs, school absenteeism, impact on workforce ("Asthma's impact on the nation," 2017) • African Americans are at greater risk of acquiring asthma, Caucasians are next, mixed races and then Hispanics ("Asthma's impact on the nation," 2017) • As children boys have a higher incidence of acquiring asthma ("Asthma's impact on the nation," 2017) • In the adult population it is females that develop asthma more than males ("Asthma's impact on the nation," 2017)
Environment • 13 counties in Colorado have ragweed pollution (Climate 2017) • 5 counties in Colorado have unhealthy smog pollution (Climate 2017) • Smoke pollution from wildfires • Drier climate increases the risk of wildfires (Climate 2017) • Higher temperatures result in worsening of smog pollution (Climate 2017) • Increased carbon dioxide levels cause plants to produce more pollen (Climate 2017)	**Technology** • Simulation training first utilized by the aviation industry, and the military (Simington, 2011) • Now used in healthcare (Simington, 2011) • New technology with high fidelity manikins • Proven to aid in the training and education of healthcare professionals (Simington, 2011) • Increased positive patient outcomes (Simington, 2011) • Use of simulation as an educational tool for the lay public was found only in Basic Life Support courses

This gap in the literature lead to an analysis of the Strengths, Weaknesses, Outcomes and Threats (SWOT analysis), see Table V, of the intended intervention in Northern Colorado

pertaining to addressing pediatric asthma. The driving forces for this project were the increase in the number of Emergency Department (ED) visits, school absenteeism, and missed days of work for the parent related to asthma flare ups. Restraining forces for this project were identified as lack of funding of schools to support offering this course to the teachers and staff in the school setting and limited professional development time allotted to schools in which this course could be provided. Although school teachers interviewed indicated a lack of knowledge related to asthma and a desire to learn school administrators reported they were already hard pressed to provide the required training and lacked the funds to pay the salaries of employees to attend this course (personal communication David, 2014). Examples of required training at the time of this study are Basic Life Support, First Aide, and Blood Borne Pathogen training. The cost of purchasing a low fidelity manikin for use in educational training for the lay public is a restraining factor. The sustaining factors for this project were the willingness of a church in Northern CO to provide the space to offer this course to parents of children with asthma within their congregation.

Table V SWOT Analysis

SWOT Analysis for Northern Colorado	
Strengths • Multiple hospitals, emergency departments, urgent care centers and clinics available • Two major health care systems • Both large health care systems currently offer simulation training for their professional staff • Established asthma education courses available the County	**Opportunities** • Need for asthma education for parents and caretakers of children with asthma • An educational workshop to measure the outcomes to determine if the knowledge deficit related to asthma and the management of asthma symptoms is a barrier. • Healthy home/school campaign

Weaknesses	**Threats**
• Limited offerings of asthma education courses in Northern Colorado • No use of simulation as a tool in education of the lay public	• Financial

The strengths of this target area include multiple hospitals, emergency departments, urgent care centers and clinics owned or managed by two major established health care systems. Both healthcare systems currently offer simulation training for their professional staff only. There were four asthma education programs found in the target area located in cities in Northern Colorado. Three of the four programs were free of charge with the fourth requiring a $10.00 fee to cover supplies which include an inhaler with spacer, workbook, and peak flow meter. One program is offered by a National health company/corporation, two by the University of Colorado, and one by the American Lung Association. This is an example of where collaboration amongst all persons involved could benefit the community. Rather than replicating programs they could work together to offer the program in other areas of Northern Colorado and potentially save money by combining services.

The weaknesses of this target area noted that none of the programs offered simulation as a method of providing hands on application of information obtained in the program. The opportunities for this project are abundant, an educational workshop is an opportunity to measure the outcomes to determine if the knowledge deficit related to asthma and the management of asthma symptoms are the primary barriers to managing their child's asthma.

A healthy home and school campaign could be an additional approach to providing education to parents and school personal about triggers of asthma, and how to maintain a healthy home and school environment. Although these additional approaches are outside the realm of this project the results found in this study may be used as a foundation for future projects.

Threats to this project were financial related to the cost of the educational materials including the use of the low fidelity simulation manikin. Sample size was also identified as a threat to the reliability of study.

Stakeholders and Project Team

The identified internal stakeholders for this study project included the children and their families. The identified external stakeholders for the study project included the schools, and the health care system. The project team consisted of the DNP Capstone Project Chair, Dr. Cris Finn; the Capstone Project Mentor, Clara Richardson MSN, RN, Clinical Development Professional; and the DNP candidate/investigator.

Cost-Benefit Analysis

There are approximately 17 million Americans have asthma with over 6.3 million of these being children; there are approximately 108,266 children in Colorado with asthma ("Asthma," 2017). In 2009, 3,388 deaths were attributed to asthma; asthma is also the leading chronic illness among children and the number one cause of school absenteeism due to chronic illness, accounting for 10.5 million lost school days annually ("Asthma's impact on the nation," 2014). Parents must miss work in order to stay home and care for their child resulting in missed days of work for the adult population, estimated at a cost of $227 million per year ("Asthma's impact on the nation," 2017). On average children with asthma visit the ED three times per year, the annual cost in the U.S. of treating asthma is estimated to be $20.7 billion ("Asthma's impact on the nation," 2017).

The reality we find ourselves practicing in is one of constant change, increased use of technology, better informed patients, administrators who struggle with containing costs, and a government that demands high quality outcomes for some the sickest of patients ("Delivery system reform," 2017). As healthcare continues to evolve it is more important than ever that we as nurses find creative ways to meet the demands of our patients, administrators, and profession. Potential benefits from an educational intervention may increase knowledge related to asthma, triggers of asthma, how to maintain a healthy home, and how to manage an asthma flare up resulting in fewer asthma flare-ups. Increased knowledge on the part of the parent and caretaker may result in the reduction of ED visits which would result in a direct cost savings for the healthcare system and medical dollars saved. The results may also reduce the number of missed school days resulting in savings for the school system in the reduction of lost Federal dollars. Parents who currently must miss work to stay home with an ill child related to an asthma flare up have a direct impact on the workforce, this project has the potential to increase knowledge on asthma and reduce the number of asthma flare ups resulting in less missed days of work related to staying home with an ill child. The community at large stands to gain from an informed population on the triggers of asthma, the management of asthma, as well as the cost savings in healthcare, Federal dollars available for the schools and a healthy workforce. Table VI illustrates the costs related to implementing this study project.

Table VI Cost Benefit Analysis

Current Costs	Program Cost	Potential Savings
Typical cost of an ED visit for respiratory problems $595.00, (ED 2014).	A meal was provided for each participant who attended and their children (13 total). Lunch was provided by researcher from Panera's at a total cost of $150.00.	Health care dollars. Reduction of by one ED visit would result in a savings of $595.00 for the Health Care industry.

Typical cost of hospitalization stay for a child ages one-17 years is $8,400.00 (Pfuntner, 2012).	Educational materials @ $1.50 each Class size of 5 adults, cost equals $7.50	The purchase of a low fidelity pediatric manikin from Laredal is approximately $1,700.00. This would be an initial one-time expense. The savings of one hospitalization (over $8,000) would far outweigh the cost

Project Objective

The mission of this project was to shed light on the barriers influencing a parent's ability to manage their child's asthma. The vision was to develop a body of work to positively impact the health and well-being of not only the individual but also the families, as well as the communities in which we reside.

Based on the PICO questions the target outcomes for this study project are:

1. Increased knowledge related to asthma, the triggers of asthma, and how to maintain a healthy home per the parents who attend the interventional education program as measured by comparison of pre-tests and post-tests.
2. Participants will gain increased confidence in their ability to recognize asthma symptoms and the appropriate response as measured by simulation checklist and responses to post course evaluation.

According to Healthy People 2020 one goal is to reduce ED visits for asthma among children and adults aged five to 64 years ("Healthy People 2020," 2017). The objective of this project was to increase the knowledge about asthma for parents of children with asthma, how to maintain a healthy home, avoid triggers for asthma flare ups, how to recognize early signs of an

asthma flare up, and how to respond appropriately to an asthma flare up resulting in fewer visits to the ED.

Evaluation Plan

Logic Model

The logic model (Appendix J) focused on the best method to deliver education on pediatric asthma with the use of simulation to the lay public. The desired outcome was parents who attend the program would demonstrate increased knowledge, increased confidence, and the ability to demonstrate skills learned in the program which would result in improved management of their child's pediatric asthma. The assumption being that improved management of pediatric flare-ups will result in fewer emergency department visits, fewer hospitalizations related to asthma, fewer missed school days and missed work days for parents who have to stay home with an ill child related to asthma.

Resources needed were a suitable location to hold the learning session, the ability to find parents interested in attending an educational session on pediatric asthma, ability to locate a low fidelity pediatric manikin to use in the simulation portion of the program, development of the curriculum and the evaluation tools and money to provide a lunch for those who participated in the program.

The assumption was with the use of simulation as a portion of the learning process the participants would retain the information longer and be motivated to avoid a severe asthma flare-up for their child. This assumption also included that the parents would be motivated to maintain a healthy home and advocate for a healthy school environment resulting in improved asthma management. It was also assumed if a lunch was offered there would be an increase in interest and an increased number of participants.

Methods

Outcome Measures

This was an exempt quantitative quasi-experimental (or empirical) study conducted to estimate the causal impact of the intervention, the workshop (Kane & Radosevich, 2011), on the target population, the parents of children between the ages of five-12 years with an active diagnosis of asthma. The study was conducted at a church in Northern, Colorado. Members of the congregation totaled 60. Flyers were distributed at the church and posted on their bulletin board for one month prior to the course. Members were reminded of the course each Sunday during church service for a total of four consecutive Sundays.

Study Variables, Design, and Data Collection

The identified variables for this study included an independent variable of the educational program provided and a dependent variable of the results of the post-test compared to the pre-test. At the completion of the didactic portion of the intervention participants applied the skills learned by practicing on a low fidelity manikin that provided as realistic as possible various scenarios (3) of a child having an asthma flare up. Scenarios were created by the Doctorate of Nursing Practice (DNP) candidate, a Registered Nurse (RN) Simulation Specialist and the DNP's mentor a RN Pediatric Clinical Development Professional, Clara Richardson, MSN, RN. Scenarios were validated by Ms. Richardson for validity. This was a pilot project using simulation with the lay public; reliability will be established by future repeated utilization of the scenarios with the pre- and post-tests.

All participants were given the opportunity to attend the workshop even if they did not agree to participate in the study. Each participant received a packet with the demographic questionnaire, the pre-test, the post-test and brief survey to take after the course. The packet and

each of its contents were coded with an alpha-numeric code prior to the sessions. Participants were asked to complete a demographic questionnaire, all five participants complied (Appendix A). A pre-test to determine the level of understanding of asthma prior to the workshop was administered (Appendix B). The didactic portion was presented by the investigator. At the completion of the didactic portion participants utilized a low fidelity simulation manikin to practice. Various scenarios were presented (Appendix C) and the five participants worked together as a group with each participant given the opportunity to practice hands on application of skills. Supplies available during the simulation included a pediatric low fidelity manikin, a peak flow meter, an inhaler, spacer, mouth piece, pediatric face mask, and a graph with average peak flows. All equipment was explained to the participants during the didactic portion with the exception of the manikin. A pre-briefing prior to the simulation portion included explanation of simulation, expectations of the participants during simulation and the manikin was explained to the participants including functionality. The investigator utilized a simulation checklist for each of the participants to document outcomes (Appendix D). A debriefing was conducted after each of the three simulation scenarios. Participants were then given a post-test (Appendix E) and asked to complete a short survey (Appendix F).

The Sample

The population for this study was the congregation of a church in Northern Colorado. Their participation was voluntary and no compensation was offered. A sample size of five participants was used from a population of 60. The participants self-reported the diagnosis of Asthma for their children for inclusion.

Protection of Human Subject

Protection of human subjects is an important aspect taken into consideration. In review of literature related to what constitutes a vulnerable population in reference to research it was decided the population for this study project, (parents) do not involve a vulnerable population. Vulnerable populations are children, pregnant women and their fetus, prisoners, persons with diminished decision making capacity, economically or educationally disadvantaged, and non-English speaking participants (Kane & Radosevich, 2011). This study project was conducted with adults on a voluntary basis, there is no financial incentive to participate in the study and only English speaking persons were included in the project. This project was approved by the Institution Review Board (IRB) at Regis University (Appendix H). The DNP candidate completed Collaborative Institutional Training Initiative (CITI) training on 07/20/2014 (Appendix G) as well as the Capstone Chair. Written consent to conduct the study was obtained from the agency (Appendix I). Participants were informed they may opt out of the study project at any time without consequences and that information will be de-identified to protect them. Data was entered into a password protected computer stored in a locked office. All paper tests were stored in a locked file cabinet in the locked office. Only the DNP candidate, mentor and Capstone Chair had access to the data. All data will is reported in aggregate.

Time Line

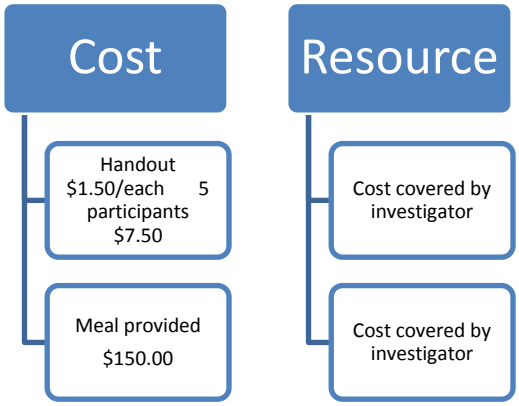
The time line for this study (Appendix K) started with the formulation and writing of the proposal to the submission of the paper for publication spanned two years. The original intent of the study was to offer the course within elementary schools with an intended audience of school personal an invitation of interested parents. Nine months were spent contacting school administrators in an attempt to secure a location which was unsuccessful. The intent of this project was then adjusted to provide an educational program for parents of children with asthma

within a rural community in Northern Colorado. The new proposal both written and oral was then obtained for the adjusted program from the study project chair. The development of the course content took three months with multiple revisions. Two months were spent with data analysis and the remainder of the time was spent in the writing and revision of the paper.

Budget and Resources

The budget is illustrated in Figure II. All costs were the responsibility of the investigator and were minimal (meal provided and handouts). A total cost to the investigator was $157.50. The investigator received no financial gain from this study.

Figure II Budget

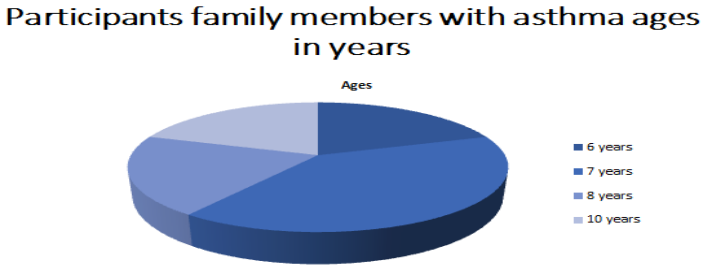


Data Analysis

Findings and Results

There were five participants in this study, four females and one male. None of the participants were related to one and other. All five were college graduates, three with a Master's degree and two with an Associate's degrees. All five participants reported they had not taken an asthma education course in the past; four of the participants had a child with asthma and one participant had a grandchild with asthma determined from the demographic questions each participant answered (Appendix A). The ages of the children with asthma for this group of participants ranged from six years to 10 years of age (Table VII).

Table VII Participants Family Members with Asthma: Ages in Years



A Pearson Correlation (Appendix L) was run which revealed the demographics did not impact the scores for all variables. The findings from the Pearson Correlation further supported that the educational intervention was the factor that increased the knowledge base of the participants in the project study.

Each participant took a pre-test prior to the course presentation to measure knowledge base related to pediatric asthma (Appendix B). The findings from the pre-test revealed a mean score of 43.3%.

The investigator, a pediatric education simulation specialist, observed all participants during the simulation portion. There were three separate simulation scenarios utilized (Appendices C), the investigator used a simulation checklist (Appendix D) to evaluate the simulation portion. The observational findings revealed all participants responded appropriately to the scenarios provided and worked as a group to self-correct and problem solve. All participants were engaged in the simulation portion, each was able to handle the equipment, utilize a spacer with the inhaler, administer the inhaler with the use of a spacer, and identify which scenarios required medical intervention verses ability to manage at home. The findings during the simulations followed the educational materials just taught.

At the completion of each simulation scenario the investigator conducted a debriefing with the participants and participants were able to review the experience, ask questions and discuss as a group what went well, what could have gone better, and what their take away was from the simulation. When all three scenarios were completed along with the debriefings the participants were given the ability to further practice on the simulation manikin, and work with equipment prior to taking the post-test.

All participants completed the post-test (Appendix E). The findings from the post-test were an overall mean score of 97.7% this was then compared to the pre-test score of 43.3%. A paired sample t-test was conducted which revealed the independent variable effect increased the score (t=-3.651 & p=0.022) (Table VII). Results of statistical data completed further supported the hypothesis that an educational intervention which includes simulation increased the parents knowledge about asthma.

Table VIII Paired Sample t-test

Paired Samples Test						
		Paired Differences				
	Mean	Std. Deviation	Lower	Upper	t	Sig, (2-tailed)
Pair 1 C3456DEpre-C3456DEpost	-0.11111	0.32338	-0.27192	0.0497	-1.458	0.163
Pair 2 C4321ABpre-C4321ABpost	-0.27778	0.16089	-0.50697	-0.04858	-2.557	0.02
Pair 3 F7654DEpre-F7654DEpost	-0.38889	0.050163	-0.63834	-0.13943	-3.289	0.004
Pair 4 B2345CDpre-B2345CDpost	-0.05556	0.2357	-0.17277	0.06166	-1.000	0.331
Pair 5 F6789GHpre-F6789GHpost	-0.27778	0.46089	-0.50697	-0.04858	-2.557	0.02
Pair 6 Aggpre-Aggpost	**-4.000000**	**2.44949**	**-7.04144**	**-0.95856**	**-3.651**	**0.022**

Reliability

Reliability refers to the idea that the same outcomes could be expected with repeated studies. Reliability is affected by random error (Kane & Radosevich, 2011). Reliability is the degree to which an assessment tool produces stable and consistent results. Examples of random error that could have occurred in the study design include: participant not completing both the pre-test and the post-test for comparison, data entry error and reluctance of participant to participate in the simulation portion.

During the study all participants completed both the pre-test and post-test and, all participants completed the simulation portion. Data entry was double checked by both the investigator and the project mentor.

Inter-observer reliability is used to assess the degree to which different raters/observers give consistent estimates of the same process. This applies to the simulation portion of the study. A simulation checklist was constructed by the investigator and reviewed by the content expert for use during the simulation portion. For future studies the best results would be obtained by the observer being a simulation specialist with experience in simulation to assure reliability in completion of the simulation checklist.

Validity

Validity refers to how well a test measures what it is purported to measure. To determine validity a study would need to be repeated multiple times by different researchers with similar outcomes. Threats to the validity of this study include small sample size, conducted at one location, and one group pre-test, post-test design and testing tools (Kane & Radosevich, 2011).

Based on the limitations of this study further studies would need to be conducted to determine the validity. Limitations include sample size, lack of funding, and short time frame to conduct the study.

Discussion

Evidence Based Practice Question

The data collected in this study demonstrated that the educational intervention increased the knowledge base related to pediatric asthma, how to manage an asthma flare-up, and maintain a healthy home in those who participated. The findings that simulation enhanced the learning experience as expressed by those who participated in the project as evidenced by 100% positive response in the evaluation tool.

The findings of this study suggest an educational program that includes simulation will increase knowledge related to pediatric asthma, implementation of such a program for all parents with a child diagnosed with asthma could theoretically increase management of asthma resulting in the decrease of emergency department visits and hospitalizations related to asthma, decrease missed school days, and missed work days for the parents.

Theoretical Support

There was evidence for support of the Adult Learning Theory, one of the theories that provided the framework for this project. The ability for adults to apply what they learn immediately to appropriate situations through the use of simulation (Clapper, 2010). During this study participants showed an increase in knowledge base related to pediatric asthma immediately after the educational intervention as measured by comparison of pre and post-test results.

Bandura's Self-efficacy theory notes outcome expectations are a person's belief that certain behaviors will result in certain outcomes whereas the self-efficacy expectations are the

person's confidence to carry out specific behaviors (Kasikci, 2010). Allowing the participants to practice newly learned skills on a low fidelity manikin provided them the opportunity to increase their confidence level. This was measured by the post course evaluation. Results of this survey indicated 100% of all participants in this study project rated feeling better prepared to respond to a child having an asthma flare up rating a five on a scale of one to five with five being the highest.

Limitations

Limitations of this study include the small sample size, the fact the study was conducted at only one location, short time frame for conducting the study, and the use of simulation in which the tool would need to be repeated to determine the validity. All participants in this study had children or grandchildren with an active diagnosis of asthma thus one can assume these participants were motivated to learn. Future studies that include participants without the same motivation may have different outcomes. All participants in this study were college educated; future studies with participants without college or even high school educations may have different outcomes as well.

Lessons Learned

This investigator learned a valuable lesson as prior to developing a program for schools in which teachers and all school staff can be taught about asthma, triggers of asthma, signs and symptoms of an asthma flare-up, and how to respond to an asthma flare-up appropriately it is imperative to assure there are funds to support the course. This investigator contacted all elementary and middle schools in three communities in Northern Colorado in an attempt to offer this course to their staff free of charge. Barriers included the number of hours for professional developments of the teachers were recently reduced in the state of Colorado. One administrator

stated there is barely enough time to cover the content that is currently mandatory for the teachers such as Basic Life Support, First Aide, and Standard Precautions. The other barrier identified by the administrators was that they did not have funding in their current budget to pay the salaries of their staff to attend this course outside of their professional development hours already built into their schedules for the school year. Two schools were willing to inquire of their staff if they would participate in the class offering if they did so on their own time. Even though interviews with several educators indicated they believed the education would be valuable all stated that although they are aware students may have an active medical plan at their school addressing how to respond to an asthma flare-up they admit they have not reviewed them. Each educator interviewed requested anonymity. The educators interviewed all stated they would not know how to react if a child in their care had a moderate or severe asthma flare-up other than calling 911. All declined to attend the course without compensation for their time. This investigator then contacted pre-schools and day cares in the same three communities, again the barrier was lack of funding to pay the staff to attend the class and the staff declining the opportunity to attend without pay. The result of the inability to reach larger audiences resulted in offering of the program to the public at a church in one of the three original communities which resulted in a small sample size for this study.

Contributions to Nursing

Nurses play a major role in educating patients and their families in the healthcare realm. It is also imperative that nurses extend their specialized knowledge to the community. This study indicates that an educational intervention that includes hands on application of new skills through simulation increases both the knowledge base and the confidence level to respond to an asthma flare-up in the pediatric population.

Further studies are indicated to validate the findings from this study. The foundation of this study can be used to develop similar programs in the school system perhaps presented by the school nurse. Likewise a nurse working in a Family Practice or Pediatric Clinic could use this study to develop a program for parents and care takers of children with diagnosed asthma.

Recommendations for Further Study

Further studies are indicated to validate the tools utilized in this study. This study had a small sample size and only one location was utilized. Future studies conducted at multiple locations with various demographics would assist in determining validity of the tools.

The limited time frame in which this study was conducted restricted the parameters of this study. Future studies could include providing all the participants at a location the same didactic presentation, then separate the group into two sections. One section would receive the simulation portion; the second section would receive the didactic portion only. Follow up phone interviews could be conducted with all participants asking the same post-test questions over a period of time to determine retention and sustainability of the information and compare the group that received simulation to the group that did not participate in simulation to determine if simulation significantly increased the retention of new information or if it had minimal to no significance. This information would be helpful to determine if the benefits of providing simulation as a portion of an educational offering would outweigh the expense of purchasing and maintain a low fidelity pediatric manikin. One would also need to take into account the salary of the nurse presenting the course; this would vary depending on each individual nurse educator. Likewise one would need to take into account the cost of the salaries of school personal attending a similar workshop, again this would vary from location to location and from personal

to personal. These financial considerations would need to be factored into the cost-benefits equation moving forward.

Conclusion

In conclusion this study was both timely and necessary to measure the impact of an educational intervention for parents and care takers of children with asthma. Asthma remains today one of the leading health care concerns globally for children ("Healthy People 2020", 2017). The impact on the health of the asthmatic child as well as the impact on the economy related to increased health care costs as appreciated by emergency department visits, hospitalizations, unscheduled provider visits, and the impact on society related to missed days of school, and the parents missed days of work to stay home with a sick child related to asthma flare-ups must be addressed (Asthma's impact on the nation, 2017).

This project was conducted safely and without threat to human rights. Outcomes from this study indicate the need for future study based on the low sample size. Additional studies will either support the findings of this initial study that there is a need for asthma education and participants gain knowledge by attending a class and applying new skills with the use of simulation or that this small sample size study results were not indicative of the overall population.

Barriers identified in the process of conducting this project were that there is a potential need for our educators in the elementary and middle schools to be afforded the opportunity to participate in asthma education as a portion of their professional development hours. In light of the reduction in the hours allotted for professional development and the fact asthma education is not required for school personal coupled with the incidents of pediatric deaths related to uncontrolled asthma flare-ups it is imperative the nurses of Colorado advocate for change.

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Appendix A

Demographic Questions

*Participant Identification Number:*_____

Demographic Questions: Addressing Childhood Asthma Education Program

1. What is your gender? Male Female
2. What is your education level?

   High School

   Community College

   Bachelor's Degree

   Master's Degree

   Doctorate Degree
3. Do you or anyone in your immediate family have asthma? Yes No
4. Have you ever taken an asthma education class in the past? Yes No

Appendix B

Pre-test

*Participant Identification Number:*_____

Addressing Childhood Asthma ***Pre-Test***

1. *List 5 signs/symptoms of an asthma flare-up.*
   - *a.* _____
   - *b.* _____
   - *c.* _____
   - *d.* _____
   - *e.* _____
2. *List 3 symptoms of a severe asthma flare-up that would require a 911 call.*
   - *a.* _____
   - *b.* _____
   - *c.* _____
3. *List 5 triggers of an asthma flare up.*
   - *a.* _____
   - *b.* _____
   - *c.* _____
   - *d.* _____
   - *e.* _____
4. *Explain how a spacer is used when administering asthma medication.*_____

   _____
5. *Explain how to use the "stop light" action plan to respond to asthma symptoms.*

   _____

   _____
6. *True or False. A child with asthma cannot participate in sports. T F*
7. *True or False. A child with asthma has an increased risk if being bullied. T F*
8. *True or False. Asthma is the number one cause of school absenteeism in the United States? T F*

Appendix C

Simulation Scenarios with Objectives

Pediatric Asthma Simulation Scenarios for Addressing Pediatric Asthma in Northern Colorado

Equipment:

- Low fidelity pediatric manikin
- Peak flow meter
- Inhaler
- Spacer
- Pediatric mask and mouth piece for spacer
- Stop light asthma action plan for each simulation

Objectives:

- Participant will recognize signs and symptoms of an asthma flare-up
- Participant will respond appropriately for each scenario
- Participant will recognize the point in which medical intervention is required

Pre-briefing will include brief history of the use of simulation, demonstration of low fidelity manikin including its functionality and expectation on how to interact with manikin during scenario. Demonstration of peak flow meter, stop light asthma action plan handout, inhaler and spacer was covered during the didactic portion of the educational intervention. Background portion of simulation is read to the participants, participants work as a group to care for the "child".

Scenario 1, mild asthma flare-up

S: Six year old male child experiencing an asthma flare-up

B: This is your son Peter; he has a history of asthma and has occasionally needed to use his inhaler in the past. Peter's normal peak flow is recorded at 173. Today you notice he has been cranky all morning, fussy, argumentative with you which is not his usual behavior. Peter refuses to eat his lunch of chicken nuggets which is his favorite meal. Peter has had a runny nose for several days and a mild cough which you noticed gets worse at night.

A: Respiratory rate 40, mild intercostal retractions, mild nasal flaring, peak flow of 130

R: Expected actions from the participants include:

- Remain calm, speak to child in a reassuring voice
- Sit child upright and loosen tight clothing
- Have child use his peak flow meter
    - Peak flow of 130 is given to the participants once they simulate use of peak flow meter

- Attach inhaler to spacer using mask
- Instruct child to take six breaths from the spacer as participant administers 1 puff keeping mask in place until after sixth breath.

Child responds to this intervention, retractions and nasal flaring are gone.

Debriefing will include the following questions:

- What went well?
- What could have been done differently?
- What is your take away from this simulation?
    - Speak to how early intervention with mild asthma symptoms may prevent or stop the asthma flare-up.

Scenario 2, moderate asthma flare-up

S: Eight year old female experiencing an asthma flare-up

B: This is your eight year old daughter Sarah; she has a history of asthma and has been symptom free for over a year. Sarah's peak flow is 240. Sarah arrives home after a sleep over at a friend's home. You notice that Sarah looks tired; she flops down on the sofa. You ask her how the slumber party went, you notice that Sarah seems to be having difficulty speaking a full sentence; she says about four to five words and stops to catch her breath. Sarah states she does not feel well.

A: Rapid respiratory rate of 45, wheezing noted, nasal flaring, moderate intercostal retractions, peak flow of 130

R: Expected actions from the participants include:

- Remain calm, speak to child in a reassuring voice
- Sit child upright and loosen tight clothing
- Have child use her peak flow meter
    - Peak flow of 130 is given to the participants once they simulate use of peak flow meter
- Attach inhaler to spacer using mouth piece
- Instruct child to take six breaths from the spacer as participant administers 1 puff keeping mouth piece in place until after sixth breath.

Child continues to symptoms

- Participants will repeat the use of the inhaler as above up to a total of four times

Child begins to breathe easier and is about to speak in full sentence

Debriefing will include the following questions:

- What went well?

- What could have been done differently?
- What is your take away from this simulation?
    - Speak to the fact that if she continues to need intervention every four hours to contact their primary care provider. See provider if symptoms are not improving after two days.

Scenario 3, severe asthma flare-up

S: 5 year old child newly diagnosed with asthma experiencing an asthma flare up

B: This is your 5 year old boy Max. You are at the neighborhood park for a birthday party for your friend's son. Max was recently diagnosed with asthma and you were given an inhaler, a spacer with a mask and instructed on how to use it. You were told his peak flow number was 147, you were given a peak flow meter but have not used it since picking it up at the pharmacy. Today Max is running around the park with his friends, Max is a very active little boy. You are visiting with your friends. One of your friends comments on how sweaty Max is laughing "boy that Max of yours sure is working up a sweat; I don't think he has stopped since you got here". You pay no attention to the comment as this friend has a daughter and just doesn't understand little boys. You continue to chat with your friends when suddenly you hear the kids off the in the distance yelling for help. You look up and notice the children circled around something on the ground, as you and the other mothers get up and start running towards the children you realize you do not see Max within the group of children. As you get closer you realize that Max is on the ground and the children are screaming for help and saying that Max can't breathe. You are stricken with fear as you approach your son; you realize all of his asthma equipment is in your blue back pack, on the front passenger seat of your car.

A: Wheezing, intercostal and substernal retractions, nasal flaring, slight circumoral cyanosis, speaks 2-3 words before needing to rest and catch breath, pale sweaty face, respiratory rate 50, agitated, peak flow of 70

R: Expected actions from the participants include:

- Request a friend to run to your car for your bag
    - Should give instructions to one member of the group of participants
    - Describe location and description of bag (front passenger seat, blue back pack)
- Remain calm, speak to child in a reassuring voice
- Sit child upright and loosen tight clothing
- Once the bag with supplies is brought to the child
- Have child use her peak flow meter
    - Peak flow of 70 is given to the participants once they simulate use of peak flow meter
- Attach inhaler to spacer using mask
- Instruct child to take six breaths from the spacer as participant administers 1 puff keeping mouth piece in place until after sixth breath.
- Child does not improve
- Repeat above process

- Child does not improve
- Participants should recognize medical intervention is required at this time, call 911

Debriefing will include the following questions:

- What went well?
- What could have been done differently?
- What is your take away from this simulation?

Age	Average Height in inches	Green Zone Peak Flow	Yellow Zone Peak Flow	Red Zone Peak Flow
5	43	147	74-118	<74
6	45	174	87-139	<87
7	47	200	100-160	<100
8	50	240	120-192	<120
9	52	267	134-214	<134
10	55	307	154-246	<154

Average height by age obtained from the CDC (CDC Stature, 2017)

Average peak flow by height obtained from Children's of Minnesota (Children's Minnesota, 2017)

Appendix D

Simulation Checklist

Task	Completed	Requires Remediation	Comments
Remains calm			
Sits child up			
Loosens tight clothing			
Retrieves equipment			
Obtains peak flow			
Attaches inhaler to spacer			
Attaches either mask or mouth piece to spacer			
Instructs child to take 6 breaths/1 puff from inhaler			
Repeats as needed up to 4 times			
Calls 911 if child is not responding to treatment			

Appendix E

Post-test

*Participant Identification Number:*_____

Addressing Childhood Asthma ***Post-Test***

1. *List 5 signs/symptoms of an asthma flare-up.*
   - *a.* _____
   - *b.* _____
   - *c.* _____
   - *d.* _____
   - *e.* _____
2. *List 3 symptoms of a severe asthma flare-up that would require a 911 call.*
   - *a.* _____
   - *b.* _____
   - *c.* _____
3. *List 5 triggers of an asthma flare up.*
   - *a.* _____
   - *b.* _____
   - *c.* _____
   - *d.* _____
   - *e.* _____
4. *Explain how a spacer is used when administering asthma medication.*_____

   _____
5. *Explain how to use the "stop light" action plan to respond to asthma symptoms.*

   _____

   _____
6. *True or False. A child with asthma cannot participate in sports. T F*
7. *True or False. A child with asthma has an increased risk if being bullied. T F*
8. *True or False. Asthma is the number one cause of school absenteeism in the United States? T F*

Appendix F

Post Intervention Evaluation

Evaluation of Addressing Childhood Asthma Education Program

On a scale of 1-5 with 1 being the lowest score and 5 being the highest, please rate the following:

Question	1	2	3	4	5
After this class I have a better understanding of asthma					
After this class I feel better prepared to respond to a child having an asthma flare-up					
I found it helpful to be able to practice on the manikin and work with the equipment					
The presenter was knowledgeable about the topic					
I would recommend this class to my family/friends					

Appendix G

Collaborative Institutional Training Initiative (CITI) Certificate

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI)

HUMAN RESEARCH CURRICULUM COMPLETION REPORT
Printed on 07/22/2014
LEARNER
Tammy Coiner (ID: 4240323)
3190 Tacanecy Pl
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DEPARTMENT Nursing
PHONE 319-331-0318
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INSTITUTION Regis University
EXPIRATION DATE 07/21/2017
SOCIAL BEHAVIORAL RESEARCH INVESTIGATORS AND KEY PERSONNEL
COURSE/STAGE: Basic Course/1
PASSED ON: 07/22/2014
REFERENCE ID: 13411690
REQUIRED MODULES DATE COMPLETED
Introduction 07/21/14
History and Ethical Principles - SBE 07/21/14
The Regulations - SBE 07/21/14
Assessing Risk - SBE 07/21/14
Informed Consent - SBE 07/22/14
Privacy and Confidentiality - SBE 07/22/14
Regis University 07/22/14
For this Completion Report to be valid, the learner listed above must be affiliated with a CITI Program participating institution or be a paid
Independent Learner. Falsified information and unauthorized use of the CITI Program course site is unethical, and may be considered
research misconduct by your institution.
Paul Braunschweiger Ph.D.
Professor, University of Miami
Director Office of Research Education
CITI Program Course Coordinator

Appendix H

IRB Approval Letter

REGIS UNIVERSITY
OFFICE OF ACADEMIC GRANTS

IRB – REGIS UNIVERSITY

July 30, 2015

Tammy Coiner
3190 Tacanecy Place
Loveland, CO 80537

RE: IRB # 15-205

Dear Ms. Coiner:

Your application to the Regis IRB for your project, "Addressing Pediatric Asthma in Rural Colorado", was approved as an exempt study on July 29, 2015. This study was approved per exempt study category of research 45CFR46.101.b(#1).

The designation of "exempt" means no further IRB review of this project, as it is currently designed is needed.

If changes are made in the research plan that significantly alter the involvement of human subjects from that which was approved in the named application, the new research plan must be resubmitted to the Regis IRB for approval.

Sincerely,

Patsy McGuire Cullen, PhD, CPNP-PC
Chair, Institutional Review Board
Professor & Director
Doctor of Nursing Practice & Nurse Practitioner Programs
Loretto Heights School of Nursing
Regis University

cc: Dr. Cris Finn

3333 Regis Boulevard, H-4, Denver, CO 80221-1099
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Appendix I Agency

Consent Letter

June 5, 2015

We, the board members of Unitarian Universalist Church of Greeley (UUCG), have reviewed the proposal submitted by Tammy Coiner RN, Regis University Doctorate of Nursing Practice candidate, to utilize our facility to present an educational session on addressing pediatric asthma in Northern Colorado.

We find this to be timely in that we plan to begin an outdoor Sunday school and our classes are conducted by the lay public.

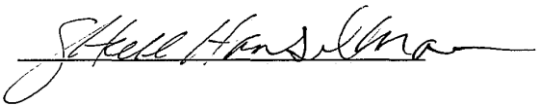
We understand this is a study project for Ms. Coiner and data collected will be used in her final capstone paper, no personal identification of our participants will be collected. We understand there will be no fee assessed to our participants for attending this educational session.

We look forward to working with Ms. Coiner on this project. Please feel free to contact with me with any questions/concerns.

Shell Hanselman Board Member at Large

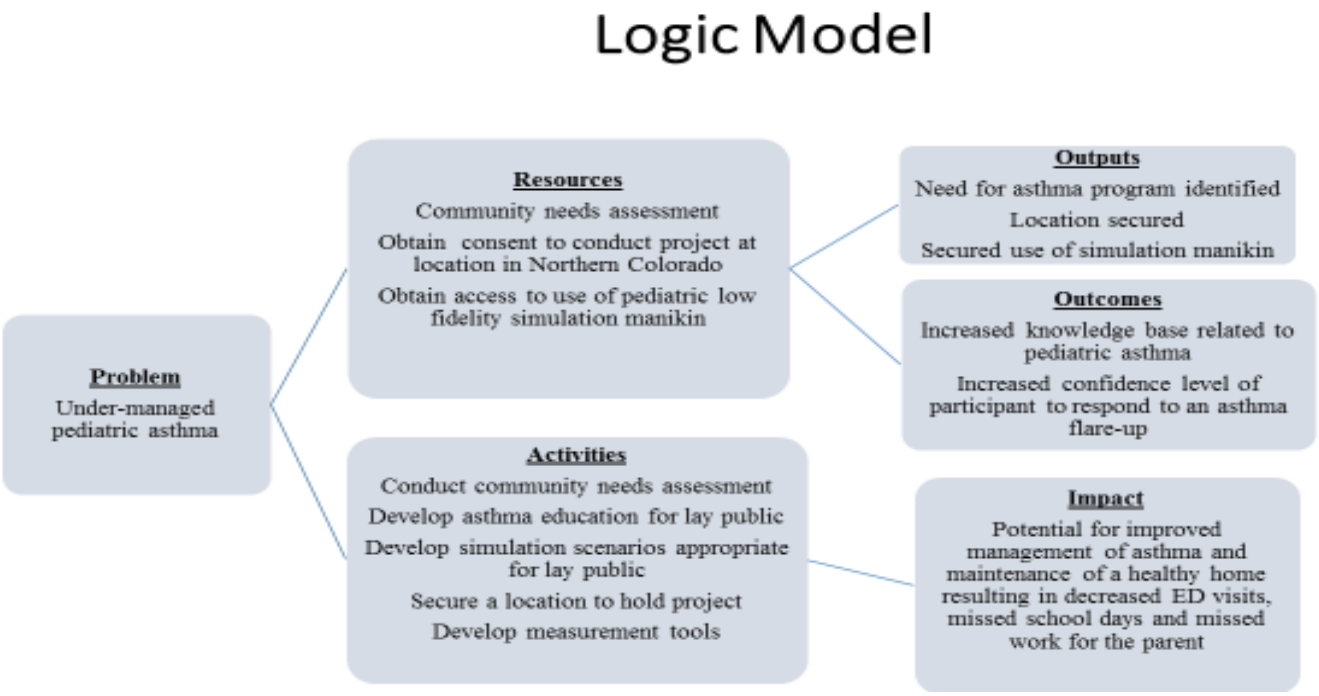
Unitarian Universalist Church of Greeley

970-405-3587



Appendix J

Logic Model



Appendix K

Timeline

Month	June 2015	July 2015	Aug. 2015	Sept. 2015	Feb. 2017	March 2017	April 2017	May 2017
Proposal Written/oral								
IRB application & approval								
Implement program								
Data collection & analysis								
Final capstone project written paper								
Oral defense								
Final submission to the library for publication								

Appendix L

Pearson Correlations

Pearson Correlations

			C5456Dbprc	C5456Dbpost	C4521ABprc	C4521ABpost	F7654DEprc	F7654DEpost	52345CDprc	52345CDpost	F6789GHprc	F6789GHpost	Aggprc	Aggpost
C5456Dbprc	Pearson Correlation	Sig.	1	a	.219	a	.000	.125	.656	a	.219	a	a	a
	(2-tailed)				.582		1.000	.621	.002		.582		.000	.000
		N	16	16	16	16	16	16	16	16	16	16	5	5
C5456Dbpost	Pearson Correlation	Sig.	a	a	a	a	a	a	a	a	a	a	a	a
	(2-tailed)	N	16	16	16	16	16	16	16	16	16	16	5	5
C4521ABprc	Pearson Correlation	Sig.	.219	a	1	a	.620	.570	.150	a	.725	a	.406	.406
	(2-tailed)		.582				.006	.014	.551		.001		.495	.495
		N	16	16	16	16	16	16	16	16	16	16	5	5
C4521ABpost	Pearson Correlation	Sig.	a	a	a	a	a	a	a	a	a	a	a	a
	(2-tailed)	N	16	16	16	16	16	16	16	16	16	16	5	5
F7654DEprc	Pearson Correlation	Sig.	.000	a	.620	a	1	.554	.243	a	.620	a	.262	.406
	(2-tailed)		1.000		.006			.150	.532		.006	*	.670	.495
		N	16	16	16	16	16	16	16	16	16	16	5	5
F7654DEpost	Pearson Correlation	Sig.	.125	a	.570	a	.554	1	.066	a	.570	a	.107	.250
	(2-tailed)		.621		.014		.150		.755		.014	*	.864	.685
		N	16	16	16	16	16	16	16	16	16	16	5	5
52345CDprc	Pearson Correlation	Sig.	.656	a	.150	a	.243	.066	1	a	.150	a	a	a
	(2-tailed)		.002		.551		.532	.755			.551		.000	.000
		N	16	16	16	16	16	16	16	16	16	16	5	5
52345CDpost	Pearson Correlation	Sig.	a	a	a	a	a	a	a	a	a	a	a	a
	(2-tailed)	N	16	16	16	16	16	16	16	16	16	16	5	5
F6789GHprc	Pearson Correlation	Sig.	.219	a	.725	a	.620	.570	.150	a	1	a	.262	.406
	(2-tailed)		.582		.001		.006	.014	.551				.670	.495
		N	16	16	16	16	16	16	16	16	16	16	5	5
F6789GHpost	Pearson Correlation	Sig.	a	a	a	a	a	a	a	a	a	a	a	a
	(2-tailed)	N	16	16	16	16	16	16	16	16	16	16	5	5
Aggprc	Pearson Correlation	Sig.	a	a	.406	a	.262	.107	a	a	.262	a	a	.821
	(2-tailed)		.000		.495		.670	.864	.000		.670			.088
		N	5	5	5	5	5	5	5	5	5	5	5	5
Aggpost	Pearson Correlation	Sig.	a	a *	.406	a *	.406	.250	a	a *	.406	a *	.821	1 *
	(2-tailed)		.000		.495		.495	.685	.000		.495		.088	
		N	5	5	5	5	5	5	5	5	5	5	5	5