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Improving Asthma Management Behaviors in School Nurses through Facilitator Training and Supported Implementation

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A DNP Project

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Abstract

Uncontrolled asthma in middle school age children and adolescents results in increased morbidity and often impairs a student's ability to participate in school activities. School absenteeism is an unintended consequence which in turn can impact academic success. School nurses can improve student asthma outcomes through effective asthma management behaviors (AMB's). The purpose of this multi-phase quality improvement DNP project was to improve both knowledge and confidence, and thereby improve AMB's in Kentucky school nurses. A convenience sample of twelve nurses participated in the project. The American Lung Association's (ALA) Kickin' Asthma training was extended to all Kentucky school nurses who utilized the Kentucky school nurse Listserv. A paired t-test was used to calculate pre-post intervention scores. Post-intervention scores for both knowledge and confidence were significantly improved. The mean for pre-knowledge is 22.58, and the mean for post-knowledge was 27.75, with n = 12. The mean for pre-confidence was 21.70 and the mean for post-confidence was 28.10 with n = 10. The p values were significant, knowledge ($p < .001$), and confidence ($p < .001$). Findings suggest that increased asthma education for Kentucky school nurses can improve asthma outcomes.

Keywords: asthma, asthma management, school-nurse, webinar training, and stock albuterol

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Asthma is one of the most prevalent chronic respiratory diseases that affects school age children and adolescents (McCabe et al., 2019). Asthma is widespread in the pediatric population and presents a significant population health issue. Uncontrolled asthma creates hardships that affect child, family, and the greater community as well. This is particularly true for school age children, and adolescents. According to The Centers for Disease Control and Prevention (CDC) report issued in 2020, 7.8% of the United States population has asthma. It is important to note that 5.8% of the 7.8% includes children under the age of 18 (CDC, 2022). Asthma prevalence in Kentucky is greater than the national average (Kentucky Asthma Management Program, 2022). This is significant as uncontrolled asthma results in increased morbidity and mortality. For example, unplanned emergency room department visits and hospitalizations often result from uncontrolled asthma (Garbutt et al., 2016).

Poorly controlled asthma reduces quality of life for the patient, and often results in excessive school absenteeism (Bowman et al., 2020). The American Lung Association (2022) reports that 10% of school age children have asthma, and this has resulted in 13.8 million days of missed school. Ahmad & Grimes (2011) also cite asthma as a leading reason for school absenteeism. This in turn can impair a student's academic success. Additional consequences include the student's inability to sustain attention during the school day as well as hindering their ability to participate in physical education classes and sports (Ahmad & Grimes, 2011). Physical education can help reduce student obesity which has been linked to asthma exacerbations (Mohanan et al.2019). Students with asthma and obesity experienced greater levels of

inflammation. Adipose tissue secretes cytokines which help to regulate inflammation. Increased levels of adipose tissue increase the risk of inflammation, a causative factor in bronchial asthma.

Background and Significance

Asthma is a chronic inflammatory respiratory disease characterized by a multitude of symptoms that includes expiratory wheezing, shortness of air (SOA), chest tightness, hypoxia, and coughing as a result of bronchial constriction, and inflammation (Bowman et al., 2020). There are multiple forms of asthma, and it is now known that individuals with asthma have chronic inflammation in the bronchial airways in varying degrees (American Lung Association, 2022). Asthma categories include allergic, eosinophilic, non-eosinophilic, exercise induced asthma, and adult onset according to the American Lung Association (ALA). Asthma is also categorized as intermittent or persistent. This is based on frequency of symptoms. Environmental exposures can initiate airway inflammation in individuals who have a genetic predisposition and result in bronchoconstriction (Diette et al., 2008). Also, a positive family history of atopy results in a hyperresponsive immune system (Diette et al., 2008).

Asthma Triggers

Asthma triggers include environmental exposures such as pollen, air pollution, secondhand smoke exposure, mold, cock roaches, and strong fragrances (Diette et al., 2008). It is estimated that a large percentage of asthma can be triggered by environmental allergies, thus making it a critical component of management (Diette et al., 2008). Other triggers include viral respiratory illness, strong emotions, physical activity, laughing, and or weather extremes (CDC, 2020). A hyperresponsive airway results in bronchial constriction, and excess mucous production in the presence of asthma triggers according to the National Heart, Lung, and Blood Institute (NHLBI, 2012). Reduced airway diameter increases the work of breathing, and often children

will utilize accessory muscles such as intercostal. Uncontrolled asthma results in numerous adverse outcomes that include increased school absenteeism as previously stated (Bowman et al., 2020).

Symptoms

Assessment of symptoms includes noting frequency during day and night, level of impairment, and frequency of short acting beta albuterol (SABA) usage. Treatment of asthma involves a stepwise approach to control inflammation and to reduce exacerbations as indicated by the National Asthma Education and Prevention Program (NAEPP) 2020 clinical guidelines (NHLBI, 2020). New recommendations include prescribing a single-inhaler maintenance and reliever therapy (SMART) in patients four years and older who experience moderate to severe persistent asthma rather than increasing the dosage of the inhaled corticosteroid (ICS) and using a separate short acting beta agonist (SABA) reliever medication (Chipps et al., 2021). Asthma management includes a combination of pharmacologic medications such as bronchodilators, inhaled corticosteroids, oral systemic corticosteroids, biologics, mucolytic agents, and Montelukast, a leukotriene receptor antagonist (LTRA) along with close supervision of symptoms (NHLBI, 2020). Symptom frequency indicates the level of asthma control and subsequent management.

Consequences

Achieving and maintaining control of asthma can improve life quality for students and their families (Ahmad & Grimes, 2011). For example, when asthma is controlled school children, and adolescents experience greater psychological benefits and confidence to participate in school and day to day activities. Uncontrolled asthma presents challenges to the student,

family, school, and community. According to the CDC 44% of the children and adolescents diagnosed with asthma had poor control during the 2018-2020 reporting period (CDC, 2022). This resulted in 790,478 emergency department room visits during 2019 with 64,525 resulting in hospital inpatient stays. According to a study written by Nurmagambetov et al. (2018) uncontrolled asthma has resulted in an economic burden of approximately 81.9 billion dollars.

This is significant as healthcare costs are higher when the child and family resort to episodic acute care facilities rather than utilizing a primary care provider on a regular basis (Kentucky Department of Health, n.d.) For example, uncontrolled asthma creates an economic burden that affects not only the patient, and family, but affects the community (Bowman et al., 2020). Lack of a primary care provider puts the child at further risk of poorly controlled asthma as the family must resort to episodic acute care facilities such urgent treatment centers and emergency departments. Providers at acute care facilities may not have immediate access to the child's medical records and thus unable to truly assess the status of asthmatic control. This could result in duplicate prescriptions as well as suboptimal management and follow up. Society bears the cost of uncontrolled asthma, but ultimately it is the child and adolescent who bear the consequences. It is important to note that school age children and adolescents spend a great deal of their day at school. Thus, the role of the school nurse cannot be understated.

Role of the School Nurse

School nurses provide acute, episodic, and chronic healthcare to students (McCabe et al., 2019). They are essential and the key to improving asthma outcomes in student health. Most often, the school nurse is the only healthcare professional on the school campus. School nurses provide a variety of services that includes education, management, and referral services. Health promotion includes helping students with asthma improve self-management through current

evidence-based education (EBE), and proficiency in technical skills such as correct inhaler technique and utilizing a peak expiratory flow meter (PFM). Asthma health promotion education also includes helping students understand how to utilize an asthma action plan (AAP). The ultimate health goal is to help the student increase self-management skills and to reduce asthma related school absences (Al Kindi et al., 2021).

To accomplish these outcomes, school nurses must be current in evidence-based asthma knowledge as well as confident in their ability to perform asthma management behaviors (AMBs). McCabe et al. (2019) describe AMBs as a combination of activities that incorporates nursing assessment, management, and referrals to community resources to improve student health outcomes. AMBs incorporate evidence-based asthma education aimed at increasing student self-management as well.

Self-Efficacy

Bandura introduced the concept of self-efficacy in 1977 (McEwen & Willis, 2019). Self-efficacy is the belief that one is capable of performing or achieving desired behaviors. McCabe et al. (2019) proposed that self-efficacy is influenced by a combination of external and personal factors. External factors include the number of students, and schools the nurse must manage. It also includes the staffing mix and whether the nurse has another licensed professional working in the clinic. Personal factors include the level of education, certification, and years of experience working in a school environment. McCabe et al. (2019) found that years of school nurse experience along with lower student to nurse ratios resulted in greater self-efficacy. Nurses with greater self-efficacy are more likely to perform AMBs. Experienced school nurses armed with current knowledge were more likely to execute AMBs according to the study completed by

McCabe et al. (2019). Knowledge often precedes confidence, so it is important that school nurses maintain and update clinical practice with current evidence-based knowledge.

School nurses can expand AMBs to further improve student health outcomes through policy development and implementation, as well as promoting environmental measures. Policy development includes promoting stock albuterol in school health clinics. Implementing environmental measures are extremely important and can help reduce asthma exacerbations during school hours. Schools have many allergens both inside and outside of the classroom. The CDC has provided guidelines to help schools develop healthy environments through the EXHALE strategies.

EXHALE is an acronym that stands for the following: E education aimed at improving asthma self-management, X-tinguishing secondhand smoke exposure, H for home visits to assess social determinants of health and asthma triggers, A-achievement of adherence to medical guidelines to manage asthma, L linkages to coordinate care from the Provider, parents, and school nurse, and E for environmental measures. In summary, these strategies incorporate education aimed at improving asthma self-management, eliminating secondhand smoke exposure, and controlling environmental exposures (CDC, 2021). All of these measures are congruent with the Kickin' Asthma strategies.

Intervention

The purpose of this DNP quality improvement project was to improve asthma management behaviors (AMBs) in Kentucky school nurses. The aim of the project was threefold. The first aim was to increase school nurse asthma knowledge and confidence. The second aim was to provide implementation support to nurses, and the third aim was to identify barriers that prevent or hinder execution of AMBs. Kentucky school nurses were introduced to the CDC

EXHALE strategies as well as benefits of utilizing stock albuterol. EXHALE strategies include education aimed at increasing self-management and this is in congruence with the sponsoring organizational agency objectives. Improving AMBs in school nurses' results in improved decision making that includes asthma health promotion with each student encounter. The American Lung Association Kickin' Asthma facilitator educational training was extended to a pilot group of up to 20 Kentucky school nurses during the first phase of the quality improvement project. Funding for the scholarships was provided by the CDC National Asthma Control Program. Implementation support followed in phase two of the project. Previous projects within Kentucky have focused on improving student self-management behaviors to improve asthma outcomes rather than focusing on AMB's of the nurse.

State Impact

Kentucky school children and adolescents are at particular risk. Asthma is widespread within the State of Kentucky (KDPH, 2016-2018). The CDC reports that overall Kentucky has a higher incidence of asthma as compared to the national average (CDC, 2022). For example, during the reporting period of 2022 the national prevalence rate of asthma in school age children less than 18 years was 7.2% compared to 10.6% for Kentucky children 11 years and younger, and 13.6% for middle school students, and 11.8% for Kentucky high school students (Cabinet for Health and Family Services, 2022). Poorly controlled asthma can impair a child's and adolescent's ability to attend school, as well as the ability to fully participate in school activities.

School nurses can improve student outcomes. Many Kentucky schools do not have access to a full-time school nurse every day and all day. In a study conducted by Darnell et al. (2019) examining the influence of school nurse presences in Kentucky public high schools on student absenteeism, the study results concluded that nurses significantly altered absenteeism. Reduced

school absences resulted in improved academic outcomes. Society as a whole can benefit when students achieve academic success. Graduates are then equipped to enter the labor market and to contribute to society. In addition, educated healthcare consumers are more likely to partner with their provider to improve health outcomes. School nurses provide disease management to students with chronic health conditions such as asthma. The study reported that only 42% of Kentucky schools had a full-time school nurse (Darnell et al., 2019).

Other factors contributing to a student's poor asthma control includes lack of health insurance, as well as limited access to asthma and allergy specialty providers. In 2021 6.4% of the general Kentucky population lacked health insurance (America's Health Rankings, 2022). Often healthcare practices are reluctant to accept non-insured patients and families due to reimbursement issues (Bowman et al. 2020). Poorly controlled asthma has cost the state millions for missed school days and for missed workdays for parents according to the Kentucky Department for Public Health (KDPH, n.d.) most recent report for 2021-2025.

Also, it is also important to note that countless Kentucky families with school age children lack sufficient resources to manage their child's disease. Adequate resources include health insurance, access to a primary care provider, and or specialty provider along with access to pharmacologic agents. Other resources include adequate housing free of allergens. As a result, numerous children lack basic socio-economic structures that could ensure healthier asthma outcomes. As stated, asthma is a costly condition that impacts all stakeholders (Bowman et al., 2020). The economic costs, higher school related absenteeism, and missed parental workdays affect society as a whole. Key stakeholders include students, schools, families, teachers, and community resources such as clinics, hospitals, and insurance companies.

Social Determinants of Health

Social determinants of health (SDOH) can be a contributing factor to poor asthma management and result in adverse outcomes (Sullivan & Thakur, 2020). Kentucky SDOH include social and environmental conditions such as inadequate housing, food scarcity, limited access to medical care, and health insurance (Schroeder et al., 2018). Poor housing along with environmental exposures such as secondhand smoke can worsen asthma symptoms (KDPH, 2016-2018). Health disparities include increased prevalence rates for the African American population (KDPH, 2021-2025).

Kentucky has a higher incidence of poverty compared to other United States citizens, and poverty hinders a family's ability to manage their child's disease. Kentucky ranks 26th among all states in the nation and is the fifth poorest state (Kentucky State Health Improvement Plan, 2017-2022). Kentucky also leads the nation in childhood obesity according to a report published by the Robert Wood Johnson Foundation in 2021 (State of Childhood Obesity, 2004-2022). The report cites that 23.8% of Kentucky children and adolescents ages 10 through 17 are obese as compared to the national average of 16.2%. As previously reported, obesity can worsen inflammation, and thus worsen uncontrolled asthma.

Problem Description

There are multiple barriers that hinder implementation of the most basic asthma strategies in Kentucky school clinics. These barriers include personal, environmental, and student factors. Personal factors include level of nursing education, licensure, years of school nurse experience, and the number of schools the nurse manages (McCabe et al., 2019). Environmental factors include nurse to student ratios, other environmental factors that may hinder nursing performance includes the staffing mix in the school clinic. Registered nurses (RNs) who worked with another RN or who have support staff such as a Licensed practical nurse (LPN) had higher outcome

performance scores. Quaranta et al. (2016), concluded that variation in nursing AMBs is influenced by the number of years of school health experience, as well as asthma knowledge. According to Quaranta et al. (2016) nurses with limited asthma knowledge lacked confidence to provide student asthma education. Students need current evidence-based knowledge to improve self-management.

Student factors include acuity level of illness, knowledge, and self-management skills. Student factors also include knowledge deficits concerning pathophysiology of asthma, medications, proper inhaler usage, and non-compliance to an asthma action plan. In a study completed by Root and Small (2019), 80% of people diagnosed with asthma could not demonstrate correct inhaler technique. Poor inhaler technique results in reduced medication delivery to bronchial airways. Limited health literacy levels hinder successful implementation of asthma education, including correct medication and inhaler technique.

Other barriers include health disparities, lack of access to asthma specialty providers (Kentucky Department of Public Health, 2016-2018) and lack of access to stock albuterol during school hours. Although Kentucky has passed Senate Bill 127 authorizing schools to implement stock albuterol, many schools have yet to implement this particular policy (Ky General Assembly, 2022). All these factors contribute to poorly controlled asthma.

Current State of Practice

A significant issue compounding this problem is lack of school nurses to manage a large school population. The current state of practice is to split nurses between several schools. This reduces the effectiveness of the nurse as a health manager. Currently, Kentucky fails to meet the minimum 1:750 nurse to student ratio as recommended by the National Assembly of School Nurses

(NASN) (2022). This is a significant issue as adequate nurse to student ratios has been shown to result in improved student health and educational outcomes (Best et al., 2011-2016).

Inadequate nurse to student ratios creates a significant practice gap as nurses play a key role in student health. Nurses provide health promotion, disease management, and often help students and families locate resources that enable them to successfully manage their disease (AAP Council on School Health, 2016). In essence, they act as a liaison between the child, family, school, and community. For example, it is the school nurse who ensures that patients with asthma have a current written asthma action plan (WAAP) on file. Health policy aimed at increasing the number of registered nurses in schools every day along with the number of advanced practice registered nurses (APRN) would help bridge the gap.

Also, implementing a stock albuterol policy through the state's school health clinics can ensure that children experiencing asthma exacerbations have access to needed medication (American Lung Association, 2018). Thankfully, Kentucky is successfully implementing policy that allows students to carry and administer anaphylaxis medications (Asthma and Allergy Foundation of America, n.d.). This includes promotion of stock albuterol in Kentucky's school health clinics. The state has developed a clinical protocol that can be utilized, and it can be found by visiting the Kentucky Department for Public Health website (KDPH, n.d.) However, currently there is not a process to implement the policy throughout the schools. Barriers include cost as well as insufficient staff in school health clinics.

Opportunities to Improve

The potential opportunity to make an impact is enormous. Evidence-based asthma management programs such as the Kickin' Asthma program can help improve AMBs in school nurses. Also, increasing the number of stock albuterol access in Kentucky schools could be an

effective strategy to improve asthma control. The State of Kentucky faces unique challenges as it strives to improve asthma management behaviors in school nurses and student health outcomes. Challenges include insufficient nurse to student ratio's as well as poor infrastructure. Improving population health requires a combination of components such as policy, access to care, education, and self-management skills to change behavior, and environmental measures, as well as sufficient nurse to student ratio's (Ky Policy, 2020).

As stated, the NASN recommends a nurse to student ratio of 1:750 (Best et al., 2020). However, the NASN (2022) cites that other factors must be considered as well when allocating the nurse to student ratio. These factors include student acuity, staffing mix, as well as social determinants of health. Statewide data illustrating specific nurse to student ratios are not available but currently the average student to nurse ratio in Kentucky school's ranges from 1:300 to 1:1900 students (Kentucky Department of Education, 2021-2022). Such a large ratio makes it nearly impossible for nurses to meet even the most basic needs of student health, and nearly impossible to focus on health promotion.

Preventive health program development aimed at reducing student asthma exacerbation requires administrative support and dedicated time beyond meeting a student's basic health needs. Establishing and maintaining adequate nurse to student ratios is important as school health clinics can be key sites to implementing asthma education, as children and adolescents spend a substantial part of their day at school, (Centers for Disease Control and Prevention, 2017). It is important to note that improving asthma management outcomes in school health requires a combination of strategies. For example, training school nurses in current evidence-based education (EBE) programs such as the ALA's Kickin' Asthma program coupled with knowledge of the CDC's EXHALE strategies, and benefits of stock albuterol could improve AMB's.

Students are likely to benefit from improved AMBs. Implementing stock albuterol in schools could help improve student health outcomes when partnered with asthma education and written asthma action plans (WAAP) (American Lung Association, 2018).

School nurses who provide asthma education must recognize that programs must be developmentally appropriate and include both cognitive and psycho-social domains aimed at sustaining behavior change. Asthma programs must also be easily delivered by the school nurse to student, school staff, parents, and caregivers. Comprehensive asthma education includes correct usage of medications, along with correct inhaler techniques. It also includes a written asthma action plan (WAAP), and skills to use a peak expiratory flow meter (PEF).

Standards of Care

Asthma clinical guidelines are provided by the National Asthma Education and Prevention Program (NAEPP) and the Global Initiative for Asthma (GINA) organization. This proposed DNP project is utilizing the clinical guidelines provided by NAEPP, as recommended by the American Lung Association, and the partnering organization the Kentucky Asthma Management Program. NAEPP developed clinical guidelines for the population in the United States (Chips et al.,2021). NAEPP revised the clinical guidelines in 2020 from the 2007 guidelines to recommend intermittent usage of inhaled corticosteroids to reduce inflammation associated with persistent asthma exacerbations (Chips et al., 2021).

NAEPP clinical guidelines utilize a stepwise approach to assessment and treatment of asthma. Daily monitoring of PEF is recommended by the National Asthma Education and Prevention Program (NAEPP) to predict worsening lung functioning and to prevent exacerbations (Chipps et al., 2022). This project is focusing on children 11 years and older.

Therefore, recommendations for the population will be addressed and will not include recommendations for children less than 11 years.

The diagnosis of asthma is based on subjective and objective factors such as patient and family history as well as pulmonary function tests (PFT) (American Lung Association, 2020). Significant patient history includes allergy, wheezing with or without respiratory infections, and exercise induced bronchospasm. Asthma symptoms are predictable, meaning that bronchospasm occurs with each asthma trigger encounter. Bronchospasm can be completely or partially reversed with administration of a short acting beta agonist (SABA).

Asthma severity is based on frequency of symptoms as previously stated and is categorized as being intermittent or persistent. Asthma that is persistent is further categorized as being mild, moderate, or severe. A prn SABA rescue inhaler is recommended for all categories to treat acute bronchospasm and bronchial constriction. Changes to clinical guidelines were developed to reduce inflammation in the persistent category. The most notable change was to introduce a prn low dose inhaled corticosteroid (ICS) along with a prn SABA (Chips et al., 2021).

Review of Literature

The purpose of this literature review was to identify existing evidence that would support the proposed intervention. It was important to determine the amount of literature written on the topic and to identify current gaps in practice. An integrative review of the literature was completed to examine both qualitative as well as quantitative data. Therefore, a formal review of literature was conducted to answer the PICO question, for school nurses and nurse practitioners (P), does asthma webinar training followed by implementation support (I) compared to no

training with no implementation support (C), improve nursing asthma management behaviors in school health ? (O).

Method for Review of Literature

The search strategy was conducted utilizing the following key words:" asthma, asthma management, school nurse, stock albuterol, and webinar training. The Boolean phrase "and" was added as well between keywords, The databases searched included Cumulative Index to Nursing and Allied Literature (CINAHL), Nursing and Allied Premium, Medline, and PubMed. The findings were furthered narrowed by limiting the search to the last eight years 2015-2022, peer reviewed journal articles, English speaking, and whenever possible to the United States. The search was conducted utilizing single terms as well as combining keywords.

Literature searches that focused on asthma, asthma management and school nurse netted the most results. Thirty-five articles were identified on the CINAHL database, and 294 articles found in the Nursing and Allied Premium database. The terms were altered in the Nursing and Allied Premium database using the following search phrase: Improving asthma management behaviors in school nurses through webinar training. This search was also limited to peer reviewed literature as well and focused on articles from 2015-2022. Forty-four articles netted in this search strategy. Medline netted 51 articles utilizing the selected search terms of asthma and asthma management and school nurse. PubMed netted seven articles. Articles were scanned for relevancy and only one article was relevant to selected search terms from the PubMed database. Many articles were eliminated that did not focus specifically on selected key terms. Literature searches that included stock albuterol netted nine papers. The literature was appraised according to the Melnyk & Fineout-Overholt rapid appraisal forms (Appendix A).

Relevant Studies

Systematic Review 1

Gegenfurtner & Ebner (2019) conducted a systematic review (SR) of the literature to examine effectiveness of webinar-based education to promote professional development. Digital platforms such as webinars offer several advantages such as accessibility and convenience. In essence, geographical boundaries are eliminated and thus accessible to a wider range of participants. The SR examined four databases utilizing a keyword search. This netted 406 articles, however inclusion criteria for the relevant reviews were based on randomized controlled studies conducted from 2003 through 2018. Duplicate studies and qualitative reviews were also eliminated, resulting in twelve studies.

The review examined student outcomes utilizing pre and posttest surveys. These were compared to the results of the control group. Webinar and participant characteristics were taken into account. Variables such as webinar length, frequency, and characteristics of the moderator were factored into the studies. Participant characteristics such as years of professional work experience, age, gender, and population was considered. Results demonstrated that age and gender differences were statistically non-significant. Outcomes were examined utilizing knowledge and performance skills. Longer webinars resulted in improved learning outcomes in comparison to those in shorter duration.

Study limitations include correction of sampling bias and that of unequal sample sizes comparing the control and experimental groups. A strength of the SR results demonstrates that digital platforms such as webinars were as effective as face to face, in person classroom learning. Data from pre and post intervention obtained from control and experimental groups to support

results. In conclusion, this SR supports digital platforms such as webinar education to improve both knowledge and performance skills of professionals.

Systematic Review 2

Ahmad & Grimes (2011) conducted a systematic review (SR) of literature to examine whether school-based asthma educational programs improve self-management outcomes. Nine studies were reviewed, and most studies included randomized control trials (RCTs). Improvement criteria included fewer school absences and decreased visits to healthcare providers or health facilities. Dr. Nola Pender's Health Promotion Model (HPM) was selected to examine how asthma education programs affected self-efficacy behaviors. Benefits of the HPM include strategies to examine a student's previous experience and perception concerning asthma management.

A strength of the study includes results that support school-based asthma education as an effective intervention to decrease school absenteeism. Asthma education included instruction on how to implement an asthma action plan (AAP), use medications correctly, and how to use a PEM to measure lung function (Ahmad & Grimes, 2011). Outcomes were measured in terms of missed school days and unplanned emergency department (ED) visits. Pre and post intervention data obtained from control and experimental groups obtained to support results. A limitation of the study results includes the inability to access student records concerning reason for school absence. Verbal reporting from student and parent was utilized to address asthma related morbidity. Also, a students' level of asthma severity was not determined (Ahmad & Grimes, 2011). Study results demonstrated a significant decrease in unplanned hospital visits after implementing the intervention. This SR supports school-based asthma education as an effective intervention to improve asthma management outcomes in school health.

Integrative Review 1

Nadeau & Toronto (2016) conducted an integrative review of qualitative literature to examine barriers that influence asthma management effectiveness of school nurses. The search strategy utilized four databases based on keyword search from 2002 through 2015. The literature synthesis resulted in 18 titles with six of those excluded based on inclusion criteria. Twelve articles met the inclusion criteria and were utilized for the review. Criteria included asthma management, barriers, and school nurse. he results were analyzed using a thematic approach.

Six themes emerged and included the following: resources and support available to the school nurse to perform asthma management behaviors (AMBs) knowledge of the school nurse pertaining to asthma and asthma management, school nurse proficiency, adequate time to manage students with asthma, poor understanding of the school nurse role by school staff and parents as well as communication barriers. Lack of resources included inadequate staff support to perform AMBs, as well as lack of equipment such as medication, inhalers, spacers, and PEM's.

Poor time constraints included inadequate nurse to student ratio's, with the nurse covering multiple schools in a school day. Lack of support included both the school administrative staff and parents. Poor communication between the school nurse, child's parents, provider, and teacher emerged as a barrier to asthma management. Often school staff, providers, and parents failed to understand the role of the school nurse and their expertise. Also, lack of nursing knowledge, student and parental knowledge concerning asthma management resulted in poor health outcomes.

This synthesis of qualitative data illustrates the multiple barriers that school nurses encounter that hinder effective asthma management. Limitations of the review include the small

sample size. A strength of the analysis includes identification of barriers. It is recommended that school nurses attend board of education meetings in their health districts in order to advocate for themselves and students.

Randomized Control Trial 1

Horner et al. (2016) utilized a randomized control trial (RCT) study to evaluate the effectiveness of asthma education delivered in rural elementary school and community settings. The study utilized the "Asthma for Kids curriculum ", that has been developed to address asthma in rural settings (Horner et al., 2016, pg. 262). The curriculum meets national asthma guidelines according to Horner et al. (2016). Educational interventions were implemented during the school day within the school setting over five weeks, or at a single asthma camp on a Saturday. Both intervention groups received four hours of instruction. Education offered in the school setting relied upon role playing to enhance problem solving for asthma management. The attention control group received four hours of general health promotion over five weeks during the school day (Horner et al., 2016).

Study results concluded that the educational interventions were effective in improving asthma self-management in both children and parents (Horner et al., 2016). Improvements were noted in self-efficacy, peak expiratory flow meter usage, and inhaler techniques resulting in decreased utilization of healthcare provider and emergency department visits (Horner et al., 2016). This study contributes to the DNP project as it demonstrates the effectiveness of asthma education as a tool to improve asthma management outcomes. It also demonstrates that asthma curriculum could be offered outside of traditional school hours as a single day asthma camp. This is important as COVID-19 policies have created many school restrictions. This has been seen during the event of COVID-19. This study could be utilized in rural Kentucky schools, granting

parents and adolescents would be interested in receiving asthma education in a community setting outside of traditional school hours.

Randomized Control Trial 2

Kintner et al. (2015) utilize a randomized control trial to compare effectiveness of an academic based asthma education program to increase self-efficacy compared to the American Lung Association's Open Airways for School (OARS) curriculum. This academic based curriculum is designed to address cognitive and psychosocial behaviors that influence self-efficacy and asthma management health outcomes. The program is called, Staying Healthy Asthma Responsible & Prepared (SHARP) (Kintner et al., 2015).

The two groups were randomly assigned, and this longitudinal study occurred over a 24-month span of time (Kintner et al., 2015). Participants included children in grades 4 and 5 and were from a moderate sized school in a lower socioeconomic level (Kintner et al., 2015). Nurses and nurse supervised elementary teachers delivered the interventions during the school day. Pre and post intervention analysis occurred at regular intervals (Kintner et al., 2015).

Self-efficacy measures included asthma symptom recognition, control, risk reduction, prevention, and improved health promotion (Kintner et al., 2015). The intervention group had improved measures resulting in improved asthma management outcomes. The SHARP educational program model included information on respiratory anatomy and physiological, proper medication usage including inhaler techniques along with rationales to increase understanding of allergen control. This contrasts with the OARS program which focuses primarily on medication (Kintner et al., 2015).

This study makes a valuable contribution to this DNP project as it recognized that individuals do not readily change behaviors based on information. The SHARP intervention incorporates an individual's cognitive and psychosocial factors to influence behavior. The intervention also provided rationales to motivate individuals to adopt self-efficacy skills. This academic based curriculum resulted in improvements in all measures of the research. This includes improved sleep, risk reduction, improved

control of asthma triggers, and symptom recognition thereby resulting in improved outcomes (Kintner et al. 2015).

Non-Randomized Control Trial

Lowe et al. (2021) conducted a study evaluating effectiveness of stock albuterol offered at schools in Pima County Arizona. The intervention was offered to all 339 schools across the district. There were 152 schools that chose to participate in the program. Schools were then categorized by organizational type such as public, private, and or charter (Lowe et al., 2021). They were also categorized as by grades, and enrollment at each school (Lowe et al., 2021).

Participating schools were given stock albuterol, along with supplies such as a spacer, a medication order, and educational training on asthma if needed (Lowe et al., 2021). Adverse events were recorded during the year. The participating schools had 1038 events, with 79.4% of events due to asthma related illness (Lowe et al., 2021). Schools that utilized the stock albuterol inhaler program had better asthma outcomes. For example, 83.9% of students regained control and were able to return to class. Lowe et al. (2021) reported that only 15.6% of students were sent home and only six students required emergency transportation to the emergency department (ED). The most meaningful results occurred in middle school students (Lowe et al., 2021).

This study demonstrates the effectiveness of stock albuterol offered in schools to improve student health outcomes for students with uncontrolled asthma. A limitation of the program is that albuterol usage should be communicated to the parent and child's primary care provider to adjust and or add controller medication. The study does not include stock albuterol inhaler medication as part of a school-based asthma management curriculum.

Evidence-based Practice Quality Improvement Project

McClure et al. (2018) identified inadequate nursing to student ratios as a major contributing factor to poor asthma management in Tennessee schools. In 2017,

Tennessee schools utilized one nurse to meet the needs of 3000 students. School nurses manage students with chronic health issues such as asthma and require adequate staffing to meet student needs.

McClure et al. (2018) developed a quality improvement project to bridge the gap between lack of full-time nursing personnel and adequate student to nurse ratios. The project aim was to increase asthma self-management skills in school children using the "Green Means Go" (GMG) intervention. Nursing faculty and nursing students developed this program to increase asthma education and to monitor asthma symptoms. The teach back method of instruction was utilized to increase comprehension of how to utilize a written asthma action plan (McClure et al., 2018).

The GMG program was implemented in a large urban public elementary school within Middle Tennessee that consisted of a predominantly African American population. The program had three components that included students, teachers, and parents (McClure et al., 2018). Knowledge deficits were identified in all intervention groups concerning asthma management. Parental reporting of student health conditions via a health questionnaire was the method utilized to identify students with asthma (McClure et al., 2018). School staff reviewed the health questionnaires and then made referrals to the GMG program to avoid health privacy violations. Students also voluntarily enrolled in the project through self-identification with project staff (McClure et al., 2018).

This paper offers valuable insight on how nursing students could help bridge the gap of inadequate nurse to student ratios. Inadequate nursing staffing is a significant barrier to improving student health outcomes such as asthma. Limitations of the project was lack of standardized tools to assess baseline and post intervention knowledge (McClure et al.,

2018).

Synthesis of Literature

The following research studies were selected to examine how webinar education with supported implementation could improve asthma management outcomes in school health. The school nurse is key to changing student health outcomes. Therefore, the school nurse must be well prepared. There are few research articles that address webinar or digital learning as a strategy to improve school nurse knowledge and asthma management behaviors. There is very little published research examining webinar education followed by implementation support as an effective intervention to enhance AMBs in school nurses. Also, research examining self-efficacy as a viable component of change behavior was examined.

Gegenfurtner & Ebner (2019) concluded in their SR examining RCT's that digital platforms such as webinars can improve professional knowledge as well as professional performance behaviors. The research demonstrated that webinar education compared to face to face in classroom learning netted similar results. It is important to note that digital platforms such as webinar facilitatated education offers several advantages compared to in classroom learning. These advantages include the ability to reach a larger audience and to exceed geographical boundaries. Convenience and accessiblity is an important consideration when the atendee is a working professional such as a school nurse. The professional can access the training on their schedule. A strength of this SR research includes comparison of not just learning outcomes in professionals but also performance behaviors. This is releveant to the proposed DNP projet because the aim is to improve not only asthma knowledge but also asthma management behaviors. A limitation of the research includes failure to examine how implementation support for a specifed period of time could influence change, and perhaps result in greater outcomes.

Other selected research examined various obstacles to school nurse AMBs. Nadeau & Toronto (2016) provided meaningful insight to the various barriers that hinder AMBs. This research is meanigful to the DNP project as identification of obstacles must occur before effective change strategies can be executed. Although, school nurses have access to evidence-based guidelines (EBG) provided by NAEPP to improve asthma management, organizational support is required for mititgation. Improving asthma self-management in students as well as improving AMBs in school nurses can help to reduce school absenteism related to asthma. This supports the United States Healthy People goals.

Three of the seven studies address both cognitive and psychosocial factors that influence chronic disease management such as asthma. This is important as sustained behavioral changes must include psychosocial factors. The studies include Ahmad & Grimes (2011), Horner et al., (2016), and Kintner et al. (2015). Ahmad & Grimes (2011) utilize the HPM as a conceptual framework to address cognitive and psychosocial factors that influence healh behaviors. Horner et al. (2016) utilizes a conceptual framework develped by Bruhn to illustrate the importance of pyschosocial factors in chronic disease management. Kintner et al. (2015) utilized an academic based asthma curriculum that also incorporated both cognitive and psychosocial factors for asthma management. These studies illustrate that psychosocial factors are an important influence on an individual's motivation to sustain behavioral changes.

School nurse AMBs includes asthma education to help students improve their self-management skills. Asthma education offered in conjunction with stock albuterol in school health clinics could improve asthma management outcomes in all stuents. Four of the six studies support school-based asthma education as a viable intervention to improve asthma outcomes. Improved outcomes included increased self-efficacy and self-management skills. This ultimately

resulted in decreased healtcare provider (HCP) visits, decreased ED and hospital visits, and decreased school absenteeism. Similarties of the studies included WAAPs, medication usage, and PEM as part of asthma education.

Only one study addressed stock albuterol in schools as a viable intervention to decrease morbidity associated with uncontrolled asthma. Lowe et al. (2021) reported that the most significant results with stock albuterol usage in the schools occurred in the middle school population. There was not data to expound on this information. Middle school children comprise early adolescence and perhaps more research exploring these relationships is indicated.

Many of these papers focused on policy development and implementation of a stock albuterol policy in the school rather than examining actual use of stock albuterol in the school. One article was older than seven years but relevant to the search because it addressed management outcomes of stock albuterol in school health. Few articles focused specifically on asthma management for adolescent health.

A study written by McClure et al. (2018) utilized graduate nursing students to provide asthma education to children. WAAPs, and PEF meter usage was included in the educational component. Improved asthma mangement outcomes were reported. This was the only study found that offered creative solutions to improve asthma management outcomes in the school through partnering with academic schools of nursing.

Gaps in Practice

Additional research examing the relationships between asthma education and stock albuterol offered in school health clinics is needed. The majority of papers that address stock albuterol occur in the grey literature and focus on policy development. It is also worthy to note

that few studies examine asthma management outcomes specifically in the adolescent population. The majority of studies focus on elementary school age children.

Guiding Theory

The Health Belief Model (HBM) was selected to examine factors that support or hinder school nurse execution of asthma management behaviors. The HBM is a behavioral change model that was originally developed to gain an understanding of public health behaviors. Researchers sought to understand why some patients would participate in wellness behaviors such as preventitive screenings and others would reject the opportunity (Galloway, 2003). The objective was to develop strategies to promote utilization of preventive health services to improve population health (McEwen & Wilis, 2019). Although, this model is frequently used to examine self-efficacy in patient populations, Quaranta & Spencer (2016) applied this model to school nurses to examine AMBs.The model is based on the premise that people assign values to health behaviors. They develop goals to achieve these behaviors based on the premise that there is a benefit, they are capable, and that they can surmount barriers (Galloway, 2003). There must be an underlying stimulus to initiate the positive healthy behaviors such as perceived susceptibility of developing an adverse condition (McEwen &Wilis, 2019). The major variables of the theory are grouped into three categories and include modifying factors, individual perceptions, and likelihood of action (Galloway, 2003). Barriers influence the decision to act.

Relevance of the Theory

The HBM is relevant to this proposed DNP project as AMBs are also influenced by these variables. The decision to act is influenced by self-efficacy, benefits, and barriers. It's interesting to note that Quaranta & Spencer (2019) noted that as barriers increased performance of AMBs decreased. Improving asthma outcomes in school populations entails health promotion that is

aimed at increasing self-management.This begins with the school nurse. Postive behavioral outcomes are dependent upon knowledge, confidence, and self-efficacy (McCabe et al., 2019). Quaranta & Spencer (2016) report that school nurses who received asthma training prior to student teaching had greater self-efficacy levels. Those nurses who lacked current current asthma knowledge declined to lead student asthma education. Students experienced better outcomes when school nurses provided asthma education.

Improved decision making translates into optimal outcomes for the students. Everyone benefits with postive self-efficacy and self-management skills concerning disease management. Community agencies such as schools and society as a whole benefit when better choices are made that improve the patient's state of health (Whitehead, 2018). The HBM provids valuable insight into helping identify barriers that hinder AMB performance. Once barriers are identified, solutions and strategies can be developed.

Organizational Agency

The Asthma Management Program is a preventive health program offered through the Kentucky Department for Public Health (KDPH). It's mission is to improve the health of all Kentuckians through prevention of problems, by providing health promotion, and to protect residents (Kentucky State Health Improvement Plan, 2017-2022). The KDPH exists under the umbrella of the Kentucky Cabinet for Health and Family Services (2017). There is a program manager for the chronic disease management branch, and a separate manager for the Asthma Management Program. The Asthma Management Program receives grant funding from the CDC National Center for Environmental Health Asthma Program grant NUEIEH001372.

Stateholders

The Kentucky asthma program has formed partnerships with key stakeholders throughout the state that includes students with asthma, families, primary care providers, health insurance companies, school clinics, health departments, hospitals, the CDC, and The American Lung Association (Kentucky Department of Public Health, 2016-2018).

Organizational Assessment

SWOT Analysis

Strengths

The Kentucky Asthma Management program provides a wealth of resources to healthcare professionals. Their website provides electronic weblinks and resources to many local and national asthma sites. They offer scholarships to cover costs associated with asthma education. For example, the Kentucky Asthma Management program provides scholarships to qualified recipients to attend the Asthma Educator Institute training provided by the American Lung Association each year. They also provided scholarships for up to twenty Kentucky school nurses to complete the Kickin' Asthma Program. The CDC EXHALE STRATEGIES are listed on the website, as well as information concerning the benefits of stock albuterol for school clinics.

Weaknesses

Limited awareness of the program in schools of nursing as well as in all professional nursing organizations. Search engine optimization could be improved to expand awareness of the program to this unreached demographic.

Opportunities

Support of this DNP project provides an opportunity to expand awareness of the program. The findings of the project will be shared at the Kentucky League of Nursing. Information concerning the program was shared in the Scholars day program for Health Sciences at Eastern Kentucky University. Information concerning the program has been shared with Berea College faculty and students.

Threats

Loss of funding from the CDC and health policy changes that impede or obstruct the work of the organization.

Congruence to the Organization

This project supports the mission of the Kentucky Asthma Management Program, whose mission is to improve asthma outcomes in Kentucky children (Chronic Disease and Prevention Branch, 2022). This DNP project was important to the organization because it helped to disseminate information concerning the multitude of resources to improve asthma outcomes in the state of Kentucky. This included introducing nurses to the American Lung Association asthma educational programs, the CDC EXHALE strateties, and benefits of stock albuterol in school health clinics.

Statement of Mutual Agreement with Agency

A statement of mutual agreement was sent to the Asthma Program manager and a seperate statement of mutual agreement was also been sent the American Lung Association Kickin' Asthma facilitator.

Methodology

The DNP project was a quality improvement initiative offered in partnership with the Kentucky Asthma Management Program. Approved school nurses agreed to complete all four of the ALA Kickin' Asthma training modules, and the required facilitator follow up. Asthma modules are as follows: Module one introduces asthma basics, module two provides education on asthma triggers and prevention. Module three provides information on medications and devices to improve outcomes and module four synthesizes all information to prepare participants to recognize emergency signs, to self-advocate, and to problem solve.

Aims and Objectives

As previously stated, the aim of the project was to improve AMBs in school nurses and the aim was threefold. The first aim was to increase school nurse asthma knowledge and confidence. The second aim was to provide implementation support to nurses, and the third aim was to identify barriers that prevent or hinder execution of AMBs. Kentucky school nurses were introduced to the CDC EXHALE strategies as well as benefits of utilizing stock albuterol. The project objectives are as follows:

DNP Project Objectives

Baseline

- 100 percent (n=20) of the pilot group of Kentucky school nurses will complete the Demographic Survey and ORIC instrument.
- To receive the Kickin' Asthma scholarship 100% (n=20) of participants must agree to satisfy the requirements and complete phase two implementation support of the project.
- Asthma knowledge and confidence will increase 50% from baseline knowledge as measured by the Pre and Post Surveys at conclusion of the Kickin' Asthma training.

Intervention

- School nurses (n = 20) will complete the American Lung Association Kickin' Asthma program within a two-week period following enrollment and achieve a passing score of 80%.
- School nurses (n = 20) will complete the required one time follow up Microsoft Teams call with the ALA facilitator following completion of the Kickin' Asthma program and complete all requirements to receive their certificate prior to beginning phase two of the project.
- School nurses will participate in implementation support (n = 20) during phase two of the project. Implementation support will be available for a period of four weeks. Each participate will complete a minimum of a one-time follow up live Zoom meeting.
- School nurses (n = 20) will identify primary barrier(s) that impede AMB's. Barriers will be assessed via the "Implementation Support Follow Up Survey," and 50% will develop a solution(s) to implement the Kickin' Asthma program guidelines at the conclusion of phase two of the project.

Process Evaluation

- School nurses (n = 20) will participate in the process evaluation. A participant feedback survey will be provided at conclusion. Data will be collected on opportunities to improve.
- School nurses (n = 20) will identify one strategy to implement the educational component of the CDC EXHALE strategies in phase two of the project, and 50% of the nurses will initiate a plan with a designated start date to execute this strategy.

- School nurses (n = 20) will identify one strategy to advocate for stock albuterol in their school setting during the implementation support period, and 50% will initiate a plan with a designated start date to execute this strategy.
- A participant feedback survey will follow at conclusion and data will be collected on opportunities to improve asthma education.

Model

This DNP quality improvement project included two phases and utilized the Plan-Do-Study-Act model (PDSA) provided by the Institute for Healthcare Improvement (2015), see apendix D. The PDSA model is useful for testing a planned change on a small scale prior to implentaton on a large scale. The model consists of the following elements, plan the change, do the change on a small scale, analyze results to determine successes or failures, and how they meet predicted objectives, and act to make changes as needed prior to implementing the planned change on a larger scale (Institute of Healthcare Improvement, 2015).

Implementation

A recruitment flyer was emailed to Kentucky school nurses through the Listserv, see appendix (M). The flyer along with the recruitment letter, appendix (N), explained the objective of the project along with inclusion criteria and expectations. A pilot group of up to twenty school nurses was appproved to receive scholarships to begin the American Lung Association (ALA) Kickin' Asthma training through the partnering organization. Nurses were selected on a first come first serve basis. There were 13 school nurses who volunteered to participate in the project who met the inclusion criteria. However, one nurse did not move forward with the project due to time constraints.

Prior to implementing the project, the ORIC survey along with the demographic survey was distributed to the pilot group of school nurses (n = 12). The intent of the ORIC survey (Appendix F) was to determine how receptive and preparded school nurses were prior to beginning the Kickin Asthma program. Once the ORIC and demographic surveys were completed, the nurses were given a code to enroll into the Kickin' Asthma training. Scholarships were provided by the CDC National Center for Environmental Health Asthma Program grant NUEIEH001372 see Appendix (M). This grant funding was provided to the Kentucky Asthma Managent program to cover the cost of the Kickin Asthma training.

School nurses must work in a school health clinic that serves children, and adolesents ages 11 years through 16 years. Scholarships requirements include a commitment to complete the entire project in a timely manner, as well as committing to participate in phase two of the project. Phase two includes implementation support and will occur one time following phase one training. Implementation support will be available up to four weeks following the Kickin Asthma program. Meetings may utilize Zoom technology and may include onsite support visits. Phase two will intoduce school nurses to the CDC EXHALE strategies, and benefits associated with stock albuterol. This phase will also explore barriers that hinder or prevent execution of AMBs. As previously stated, these barriers include personal, environmental, and student factors (McCabe et al., 2019).

Timeline

The anticipated duration for the project was a six week period, that began in the spring of 2023. The anticipated start date of the project was February10th, 2023, and the anticipated end date was established for no later than April 14th, 2023. Nurses were expected to enroll into the program no later than February 20th, 2023. Once enrolled, nurses had two weeks to complete all

four modules and the ALA facilitator follow up meeting. All participants were expected to complete all requirements of the Kickin' Asthma program no later than February 28th, 2023. Implementation support and phase two of the project began following completion of the Kickin' Asthma program. The deadline to complete implementation support was established for March 20th and at the latest April 14th, 2023. Pre and Post intervention questionairres were utilized to obtain data concerning asthma education. As previously stated, anticipated barriers that could impede the project timeline included the school nursing schedule as determined by the school system. Other barriers may include lack of participation, and failure to complete the entire project. See proposed timeline for implemention, Appendix (H).

Setting

The Kentucky Asthma Management Program was the primary organization for the project, and as stated, falls under the umbrella of the KDPH. The Asthma program is listed on the KDPH website. Kentucky school nurses are aware of this website. The organization has provided access to the Kentucky school nurse Listserv which provides an online platform for communication across the State of Kentucky. School nurses will access the Kickin' Asthma training online through the American Lung Association's (ALA) website. During phase two of the project facilitator support will occur online using Microsoft Teams and Zoom technology.

Intervention

The proposed intervention utilized the Kickin' Asthma curriculum to provide education to school nurses who work with students age 11 though 16 years. The four modules provide interactive education concerning asthma pathophysiology, triggers, medications, and emergency management. Completion of the educational component requires meeting one time with the ALA

facilitator to review basic knowledge and to develop effective student teaching strategies. The implementation phase followed phase one and consisted of a one-time follow up Zoom call to discuss barriers that may hinder or prevent effective AMBs. School on site visits were an option for those nurses residing in Pulaski , Rockcastle, or Madison county school districts.

Recruitment

After IRB approval subjects were recruited and given informed consent.

Inclusion and Exclusion Criteria

A letter of introduction along with a recruitent flyer was sent to Kentucky school nurses using the Statewide nursing Listserv. The letter provided an introduction to the proposed project along with necessary criteria to qualify for the Kickin Asthma scholarships. Acceptance of the Kickin Asthma scholarships along with the stated and written guidelnes served as informed consent to participate in the proposed DNP project. A pilot group of up to twenty school nurses who met inclusion criteria would be selected by first come first serve basis. Inclusion criteria includes caring for a student population of ages 11 through 16 years. Qualified school nurses must then agree to complete the Kickin Asthma program in a timely manner as specified in the letter and agree to complete implementation support.Exclusion criteria will be those school nurses who provide care to children outside of the stated parameters, and those nurses who are unable to complete the entire program as specified. This includes completion of the educational webinar component along with completion of the implementation support.

Anticipated Barriers

Anticipated barriers included recruitment of less than twenty nurses. Other barriers included inability of the participants to complete the Kickin’ Asthma training within the

projected timeframe as well as poor participation during phase two of the project. As stated, the school nurse schedule could impede timely completion of the project.

IRB and Ethical Considerations

Eastern Kentucky University (EKU) will be the Institutinal Review Board (IRB) of record. IRB will include a limited review prior to project implementation. After securing Institutional Review Board (IRB) approval, and approval from the partnering organization, a recruitment letter and flyer was sent through the Kentucky nursing Listserv. The recruitment goal was to enroll 20 school nurses who provide care for adolescents 11 years and older. Once enrollment was completed, an organizational readiness assessment would be conducted. Ethical considerations included inability to provide the evidence-based asthma program to all interested school nurses. Asthma training and facilitator support were delivered in a bias free format.

Intervention and Population

As previously stated, the target population for the intervention was school nurses who provided care to students ages 11 through 16 years. The American Lung Association's Kickin' Asthma curriculum is designed for this age group. As stated, the program consist of four modules that include asthma basics, triggers and prevention, medications and devices, and problem solving.

Measures and Instruments

The project utilized convenience sampling to recruit a pilot group of up to twenty Kentucky school nurses. Twelve nurses were selected to begin the program. In phase one of the project a demographic survey as listed in Appendix (E) was distributed along with the Pre-test knowledge and confidence surveys. These surveys were self-developed and utilized a five point

Likert scale. Validated instruments for the project included the organizational readiness to implement change (ORIC) (Shea et al., 2014).

Data Collection and Analysis

Surveys were distributed to the training coordinator at the Kentucky Asthma Management Program and placed into Survey Monkey. Survey links were sent to the Principle Investigator for distribution to participants. All surveys were anonymous and identified through IP addresses. Survey results were then sent to the Principle Investigator from the Kentucky Asthma Management training coordinator. SPSS was used to analyze survey resutls.

Demographic Survey

The demographic survey consisted of seven questions and was used to assess level of pre-licensure nursing education, hours of asthma education, number of students seen in clinic with asthma, and whether asthma education is provided in the clinic. Rationales are provided to support questions.

ORIC

The organizational readiness assessment survey was adapted from the 12 point organizational (ORIC) tool developed by Dr. Shea and associates (2014). Dr. Shea was contacted and permission was granted to modify the tool for this quality improvement project. The adapted tool was used to assess school nurse receptivity and preparedness prior to beginning the intervention. A five point Likert scale was used to rate commitment. The Likert scale utilizes either a five or seven point ordinal scale to meaure participant attitudes (Sullivan & Artino, 2013). Responses are categorized according to personal preference and responses range from strongly agree to strongly disagree. The scale was ocrginally developed by Rensis Likert.

Knowledge and Confidence Assessment (Pre-Post)

The knowledge and and confidence surveys used a five point Likert scale to measure participant responses concerning asthma basics, triggers, medications, devices, and asthma action plans.

Program Evaluation

Upon completion of implementation support in phase two of the project a process survey with identified barriers was distributed to participants. A five point Likert scale was used to rate significance of identified barriers. The survey also included two open ended questions asking participants to describe one strategy to implement the educational component of the CDC EXHALE strategies as well as a strategy to advocate for stock albuterol. Data with stated barriers was examined for frequency. The project utilized a mixed methods data collection process. A repeated measures T test was utilized to analyze data from the Likert scales. SPSS statistical software was utilized for data analysis. A participant survey was distributed to obtain feedback concerning satisfaction and improvement following completion of the implementation support.

Data Storage

Data from the DNP project was stored on the Microsoft Office 365 Onedrive cloud storage. This service offers encryption and 2 factor autentication. Information will also be shared securely with Eastern Kentucky University (EKU) DNP faculty and team members.

Budget and Timeline

The proposed budget (Appendix L) and timeline (Appendix K) are provided in this document. Projected costs for the project was estimated at $10,419.00. Costs to complete the

project were much less than anticipated at $507.00. Most of this cost reduction was due to the generous grant funding provided by the CDC National Center for Enviromental Health Asthma Program Grant to the Kentucky Asthma Management Program. Scholarships were approved for up to 20 participants at $400.00 per person for a total of $8000.00. Labor cost to cover school nurse participation was not a factor, and salary cost was covered by their respective employers.

The cost of the Canva subscription was less than anticipated as well at $45.00 for a three month subscription. Canva is an online design tool used to assist with professional presentations. Canva was used to develop the recruitment flyer. A subscripton had to be purchased in order to purchase the flyer. Printing costs were less than anticipated as well. The actual cost for printing the poster for the DNP project poster was $22.00. Cost to purchase the Statistical Package for the Social Sciences (SPSS) software was $50.00 rather than the anticipated $100.00.

Phase two of the project utilized Zoom technology rather than onsite school visits resulting in no mileage costs. Lastly, the partnering organization provided the scholarships to attend the Asthma Educator Institute conference and the Kickin' Asthma training for the Principle Investiator, at a combined value of $1400.00. The anticipated timeline for project completion occurred earlier than expected. This is partly due to the cooperation of the dedicated group of nurses who participated in the project and diligence of the partnering organization as well.

Results

The project utilized a mixed methods data collection process. A repeated measures t-test was used to determine differences in the pre and post means for both knowledge and confidence

scores. Statistical Package for the Social Sciences (SPSS) software provided by IBM, version 28 was used to complete the analysis.

Demographics

There were 13 school nurses who volunteered to participate in the project who met the inclusion criteria. However, one nurse could not move forward with the project due to time constraints. Twelve nurses began the project with ten nurses completing the project. Results are as follows: n=12. Bachelors degree 25%, Associate degree 67%, Licensed Practical Nurse 8% with 33% holding certification as a school nurse. Also, 50% of participants had less than five years of experience working as a school nurse. Baseline project objective was met to have 100% participation.

ORIC

Results of the ORIC are as follows with n=12: 73% of school nurses agree that asthma management could be improved in school health. Also, 55% strongly agree that the Kickin' Asthma program could improve asthma management, and 45% of the participants reported a very strong commitment to implement change in their schools to improve student health outcomes. Baseline project objective was met to have 100% participation.

Knowledge and Confidence

School nurses completed the Kickin'Asthma training within a two week period and met the project goal of achieving a minimum score of 80%. Project goal met that 100% of participants would complete the ALA facilitator Microsoft Team call to receive certificate of completion. Certificates were sent to the Principal Investigator for verification. Upon completion, the post knowledge and confidence surveys were distributed.

A repeated measures t-test was used to determine differences of means between pre-post intervention and the p value on the same group of participants. The significance level for the p value was set at 0.05. Cohen's d statistic for the post-knowledge and the post-confiedence was used to determine magnitude of effect.

As shown it Table 1, results of the pre-post knowledge are as follows with n=12.

Table 1

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PRE-K TOTAL	22.58	12	4.295	1.240
	POST-K TOTAL	27.75	12	2.094	.605

Paired Samples Test

		Significance	
		One-Sided p	Two-Sided p
Pair 1	PRE-K TOTAL - POST-K TOTAL	<.001	.001

The repeated measures knowledge results revealed an increase in the mean differences of 5.17 in the post-test scores with a t value of 4.4. The p values for knowledge < .001. Both the t and p values support rejecting the null hypothesis. Results are significant and reflect that the intervention was effective. Magnitude of effect was large, see Appendix(O).

As shown in Table 2, results of the pre-post confidence are as follows with n=10.

Table 2

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PRE-C TOTAL	21.70	10	3.713	1.174
	POST-C TOTAL	28.10	10	1.792	.567

Paired Samples Test

		Significance	
		One-Sided p	Two-Sided p
Pair 1	PRE-C TOTAL - POST-C TOTAL	<.001	.001

The repeated measures confidence results also revealed an increase in the mean differences of 6.4, and a t value of 4.7. The p values was < .001. Results are significant and reflect that the intervention was effective. Both the t-test and p value results provide evidence to reject the null hypothesis. Note CI = 95% for both knowledge and confidence scores. The magnitude of effect was large, see Appendix (O). The project objective was met to increase asthma knowledge and confidence by 50% from baseline following the intervention.

Phase Two Results

Phase two results revealed that none of the participants were aware of the CDC EXHALE strategies. Stock albuterol results revealed that 60% of the school clinics do have a policy in effect and that they are currently utilizing the medication. Project goal for 100% participaton to complete implementation support via Zoom call was completed. Following the call, the CDC EXHALE strategies guidelines were distributed to participants, along with the stock albuterol policy.

Process Results

Significant barriers that prevent execution of effective AMB's include the following: Time constraits 67 %, communication challenges 56% , and lack of knowledge 44%, limited support 44%, and lack of awareness of the nurses'expertise 11%. Identified barriers listed on the

process survey were taken from the literature. Nurses completed the two open ended questions at the end of the survey. Participants listed one strategy to implement the “E” educational component of the CDC EXHALE strategies, and listed on strategy to advocate for stock albuterol at their respective schools. Project objective met with n=11.

Participant Satisfaction

Participant satisfaction results were as follows: 56% were very satisfied with the Kickin’ Asthma educational intervention, 56% were very satisfied with the implementation support, and 44% expressed that implementation support could be strengthened with additional meetings. Project goal partially met with n=9.

Discussion

Online asthma education is an effective intervention to improve AMBs. The Kickin’Asthma program offered evidence based strategies to improve asthma outcomes in school age and adolescent populations. Nurses were highly satisfied with the program and online format. This method of instruction was efficient and easily accessible. The literature supports digital platforms such as webinar based education to promote professional development. It's interesting to note that nurses were less confident with asthma medications and devices prior to completion of the intervention. Also, none of the participants were aware of the CDC EXHALE strategies, and this demonstrates a need to increase awareness. There is also a need to explore barriers that impede stock albuterol usage throughout the State of Kentucky. Further research is needed.

Limitations

Limitations for the project include the following, small pilot group size with an attrition rate of 16.6 %. Missed recruitment opportunities include those nurses who do not subscribe to the Statewide school nurse Listserv website. This includes nurses employed by private schools and those school nurses employed by hospitals, who are delegated to work in schools. Those hospitals do not utilize the Statewide Listserv for their school nurses. Other limitations that may have affected enrollment include the large nurse to student ratios', and as stated Kentucky fails to meet the 1:750 nurse to student ratio. Also, completing the project within the school calendar posed a unique challenge as each nurse worked in a different school throughout the State. Each school has a different calendar, with varying work schedules.

Implications

Digital platforms such as webinar-based education can be an effective efficient tool to improve AMBs in Kentucky school nurses and to thereby improve asthma outcomes. Implementation of the CDC EXHALE strategies in conjunction with the ALA Kickin' Asthma training can reduce asthma exacerbations. This would reduce the number of unplanned hospitalizations and reduce school absenteeism.

Sustainability

The project is sustainable, and provides support of the sponsoring organization's mission. The sponsoring organization can expand training opportunities to include the open airways for schools as well. The sponsoring organization will utilize the information to support grant funding from the CDC. Future projects could include the American Lung Association's Open Airways for Schools (OAS) program that was developed for children in elementary schools (American Lung Association, 2023). Also, dissemination of the project findings through the Kentucky

School Nurse organization could support advocacy efforts aimed at improving asthma outcomes in school health. School nurses are expected to implement Kickin' Asthma strategies within their respective schools and this could improve asthma outcomes in Kentucky Schools

Future Scholarship

This DNP project along with findings was shared at Eastern Kentucky University College of Health Sciences Scholars's Day program on April 11, 2023. A poster was developed to share information concerning the project. The poster also was presented on April 12, 2023 at the University wide Presentation Showcase. Lastly, the poster with the findings will be shared at the Kentucky League of Nursing conference in 2023, Louisville Kentucky.

Conclusion

In conclusion, the prosposed DNP quality iniative program has been developed to improve asthma outcomes in school health. Improving knowledge and confidence levels in school nurses will contribute to overall student health. School nurses provide direct care, health promotion, and are valuable advocates for population health. Targeting school nurses rather than students will make a greater impact and have long lasting sustainability.

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Appendix A. *Evaluation Tables*

First Author (Year)	Conceptual Framework	Design / Method	Sample /Setting	Major Variables Studied and their Definitions	Measurement	Data Analysis	Findings	Appraisal Worth in Practice
Gegenfurtner & Ebner 2019 (28) 1-19.	None reported	SR Literature review and meta-analysis of RCT's **Purpose:** Examine effectiveness of digital technology and webinars in higher education and professional training. 406 articles screened, resulting in 51 articles, and 44 articles excluded due to failure to meet RCT inclusion criteria, netting 12 studies.	Students in higher education and trainees in professional training Webinar instruction	Face to face instruction Participant characteristics include age and gender Webinar training Webinar duration and Moderator variables	Pre and Post test Surveys	Cohen's d estimate for differences between pre and posttest analysis Results show a large effect supporting webinar education Cohen's d value 1.556	Webinars can be as effective as face-to-face instruction when uses to increase professional knowledge and performance behaviors Differences in age and gender were statistically non-significant ($p > 0.05$)	Examines utility of webinar and digital technology in professional training

First Author (Year)	Conceptual Framework	Design / Method	Sample /Setting	Major Variables Studied and their Definitions	Measurement	Data Analysis	Findings	Appraisal Worth in Practice
		Searched 4 databases from 2003 to 2018						
Ahmad & Grimes 2011 The Journal of School Nursing 27 (4) 282-292	Health Promotion Model HPM	SR exam of RCT's 2 databases searched from 1995-2010 9 studies selected **Purpose:** Asthma Ed and interventions that use HPM increase SM	School age children 5-18 Setting: 6 Schools in USA, 1 school Toronto Canada 1 school Beijing China 1 school Australia	IV: School based asthma educ DV: < morbidity as evidenced by less missed days of school and acute care visits to HCP and ED	Interviews Questionnaires Self-reporting of missed days from school and visits to HCP and ED Surveys	6 studies reported a statistically significant decrease in missed days of school	< school absences Improved asthma SM < unplanned visits to see HCP and to ED	Level I Evidence Examines effectiveness of school-based asthma educ Strength: Uses HPM Weakness: research dated Contribution: Uses HPM to support school-based asthma ed

First Author (Year)	Conceptual Framework	Design / Method	Sample /Setting	Major Variables Studied and their Definitions	Measurement	Data Analysis	Findings	Appraisal Worth in Practice
								to increase SM
Nadeau & Toronto 2016 (32) 86-98	None reported	Integrative review of qualitative literature 7 articles met inclusion criteria Cross sectional survey studies, qualitative and semi-structured interview studies Inclusion criteria, peer reviewed 2002 - 2015	School nurses, school setting	School nurse AMBs Study did not specify exact behaviors Barriers to asthma management	Quality appraisal tool developed by Hawker, Payne, Kerr, Hardey, and Powell in 2002 used to appraise studies Given a score of 1 through 4 with 4 being the highest	Thematic, a data matrix used to categorize data	6 themes emerged influencing school nurse ability to execute AMBs Themes include lack of knowledge, lack of awareness of nurse's expertise, limited resources, lack of qualified nursing staff, time constraints, and limited support	Barriers identified that obstruct AMBs include lack of knowledge. Barriers may be unique to a specific school so important not to generalize barriers to all schools

First Author (Year)	Conceptual Framework	Design / Method	Sample /Setting	Major Variables Studied and their Definitions	Measurement	Data Analysis	Findings	Appraisal Worth in Practice
Horner, S.D. et al. The Journal of Rural Health 2016 (32) 260-268.	Bruhn's Theoretical Model of Asthma SM	SR 2 RCT's utilizing a longitudinal design over 12 months **Purpose:** Compare asthma Ed delivery in school vs day camp on Sat and effect on SM Schools randomly assigned to 1 0f 3 groups Attrition rate: 12.3	33 schools in 5 rural Texas districts N = 6 High SES school N = 27 Low SES school Sample size 238 Setting: In school asthma class, asthma day camp, Control group Children Attrition: 16 %	IV: TAPK IV: ACI DV: ISM	Questionnaire	Growth Curve Analysis	Greater number of boys in ACI group Day camp group statistically significant reduction in Hospitalizations School group Educ statistically significant for asthma severity and office visits	Level II Asthma severity decreased Decreased ED visits Strength: school age children in rural schools Weakness: limited to 1 state in USA limits application to more generalized population Contribution to project: will focus on school setting, rural

First Author (Year)	Conceptual Framework	Design / Method	Sample /Setting	Major Variables Studied and their Definitions	Measurement	Data Analysis	Findings	Appraisal Worth in Practice
								Kentucky schools
Kintner E.K. et al. Journal for Specialists in Pediatric Nursing 2015; 20: 62–75	AAM conceptual model	Phase III, two-group, cluster randomized, single-blinded, longitudinal design-guided study **Purpose:** Compare academic based asthma curriculum SHARP to OARS	N = 205 caregivers of school age children 23 schools utilized SHARP N = 117 OAS N = 88 Attrition 12 %	IV = SHARP IV OAS DV = Self-management behavior	AAM Gen health hx survey Asthma health behv survey	Rubin's formula for estimate of parametric values	Improved self-efficacy post SHARP IV	Level II Strength: Increased caregiver knowledge increased student Weakness: study dependent on caregiver participation
Lowe A.A. et al. Journal of Allergy and Clinical Immunology, 2021, 148(2), 420-427.	None reported	Convenience sample of health personnel Categoric **Purpose:** Evaluated effect of stock inhaler program	339 schools in Pima County AZ eligible 229 schools participated = 82 % in county	IV: Stock inhaler usage IV: Events by school type DV: # of students returning to	Chi square to evaluate categoric outcomes and Poisson hurdle regression to	RE-AIM Mean # of SABA puffs 2.7 (SD=1.2) per event 83.9% of events, students able to	1038 events occurred P values statistically significant for all categories	Level III Study demonstrates effectiveness of stock inhaler program in school

First Author (Year)	Conceptual Framework	Design / Method	Sample /Setting	Major Variables Studied and their Definitions	Measurement	Data Analysis	Findings	Appraisal Worth in Practice
			50% of students Hispanic 56% of students enrolled in National Lunch Program 152 schools used a stock inhaler	class after event	examine stock inhaler use by organization, grade, & type of school health personnel	return to school 15.6 % sent home 6 events required 911 transport		Strength: program costs reasonable, $156.00 per student Weakness: Clinical guidelines include use of ICS with SABA to control symptoms Contribution to Project supports stock albuterol policy in schools
McClure, N. et al. Journal of Pediatric Nursing, 2018; 42, 16-	None reported	Correlational descriptive study	N = 90 students N= 12 teachers N= 1 parent	IV: Asthma Educ Curriculum GMG DV: ISM	Self-assessment surveys	School attendance with Daily self-reporting	Partnering with schools of nursing beneficial to provide	Level VI Strength: demonstrates supported

First Author (Year)	Conceptual Framework	Design / Method	Sample /Setting	Major Variables Studied and their Definitions	Measurement	Data Analysis	Findings	Appraisal Worth in Practice
20			Urban elementary school in middle Tenn. Nursing students partnered with school and faculty to deliver Asthma Educ		Post-test given to teachers, Students asked to teach back symptoms and SM strategies ,	of symptoms and albuterol usage in school	asthma educ in school settings	Asthma Educ improves SM Weakness: School policies may hinder implementation Study demonstrates that supported Asthma Educ improves SM and that nursing students can bridge nursing staff shortage in

First Author (Year)	Conceptual Framework	Design / Method	Sample /Setting	Major Variables Studied and their Definitions	Measurement	Data Analysis	Findings	Appraisal Worth in Practice
								school clinics

AAM = Acceptance of asthma model AAP = Asthma action plan ACI = ACT = Asthma control test
AMB= Asthma management behavior
Behv = behavior CINAHL= Cumulative index of Nursing and allied health literature Clin= Clinical
EBG = Evidence based guideline ED = Emergency Department ERIC = Education resources information center GRADE = Grading of Recommendations, Assessment, Development, and Evaluation GMG = Green Means Go
HCP = Health Care Provider
ISM = Improved self-management IV =Intervention OAS = Open airways for school PFM = Peak flow meter PRISM = Preferred reporting items for systematic reviews and meta-analysis RCT = Randomized control trial RE-AIM = Reach, Effectiveness, Adoption, Implementation, Maintenance SABA = Short acting beta-agonist

SE = Self-efficacy SES = Socioeconomic status SHARP = Staying Healthy–Asthma Responsible & Prepared SM = Self-Management SMART = Single inhalers maintenance and reliever therapy
SR = Systematic review Subspecialty clinics = Asthma, Allergy, Pulmonary TAAC = Take action for asthma control
TAPK =The asthma plan for kids, developed specifically for children in rural areas
UAP = Unlicensed assistant personnel UTD = Up to Date WAP = Written Action Plans
WAAP = Written asthma action plan WVU = West Virginia University

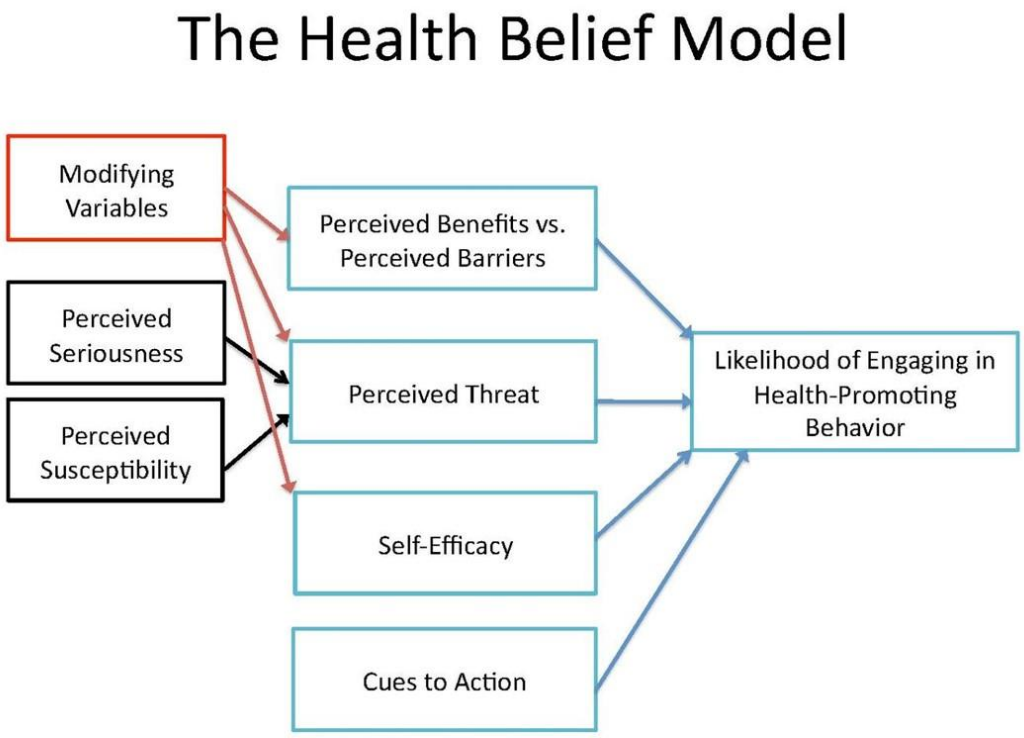
Appendix B. *Intervention Table*

Intervention Details	Gegenfurtner & Ebner 2019	Ahmad, E. & Grimes, D.E. 2011	Nadeau & Toronto 2016	Horner, S.D. et al. 2016	Lowe, A.A. et al. 2021	Kintner E.K. et al. 2015	McClure et al. 2018
Webinars in Higher Ed and Professional Training		X		X		X	X
Asthma Education and Effects on SM							
Stock Albuterol Offered in School Health Clinics					X		
WAAP to manage chronic health conditions						X	

Appendix C. *Theoretical Model*

Figure 1

Health Belief Model



Note. The table illustrates the concepts of the HBM model and their respective relationships. The source of the table is from the following: Urich, A. (2017). Coping with Anxiety and Depression. *Methods for Stress Management*. https://psu.pb.unizin.org/kines082/chapter/the-health-belief-model/

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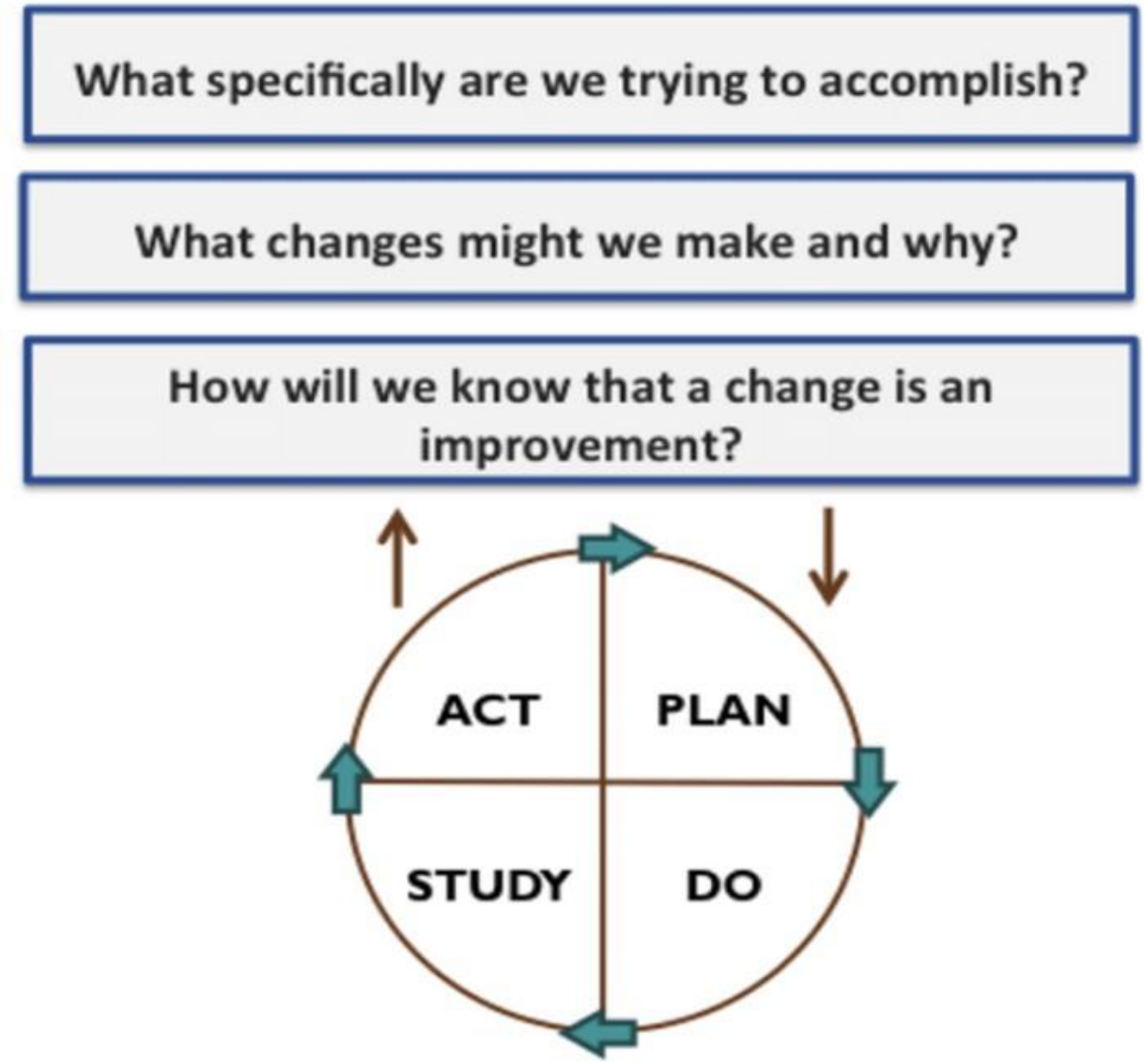
Appendix D. *Plan Do Study Act Model*

Figure 2

Plan Do Study Act Model



Note. The table illustrates the concepts of the PDSA model. The source of the table is from the following: Institute for Healthcare Improvement (2022). https://www.Science of Improvement: How to Improve | IHI - Institute for Healthcare Improvement

Appendix E. *Demographic Survey*

Demographic Question	**Rationale**
Highest level of Nursing Education Licensed Practical Nurse Associate degree in nursing Baccalaureate degree in Nursing Master's degree in nursing Other	Determine baseline nursing education
Approximately how many (estimated) hours of asthma education did you receive in your nursing program? 2 hours 4 hours 6 hours 8 or more hours	Determine baseline level of asthma education
How confident are you in managing students with asthma? Not confident Confident Very Confident	Determine baseline skills
How many students do you see in the school clinic because of asthma symptoms? <5 5-10 10-15 >15	Provides baseline data concerning prevalence of asthma at school
Does the school nurse provide asthma education to students diagnosed with asthma during the school year? Yes No	Determines whether asthma education provided to students
Does your school clinic utilize a stock albuterol program? Yes No	Provides information concerning stock albuterol at school
If no, Is the Principal aware of the Kentucky Department of Public Health Clinical Protocol for Bronchodilator Rescue Inhaler in the School Setting? Yes No	Provides information about leadership knowledge

Appendix F. *Organizational Readiness Assessment Survey*

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

Asthma management can be improved in school health clinics					
The Kickin Asthma program can improve asthma management					
School nurses are receptive to receiving asthma educational training					
Nurses who work in school health are committed to improving asthma management behaviors					
Nurses who work in school health feel confident that they can implement change to improve student health outcomes					
School nurses who work here feel confident they can handle the challenges that may arise to implement the change					

Appendix G. *Pre and Post Knowledge Evaluation Tool, Likert Scale*

Category	**Strongly Agree 1**	**Agree 2**	**Undecided 3**	**Disagree 4**	**Strongly Disagree 5**	**Total Score**
Able to explain asthma basics						
Identify triggers and help students develop avoidance strategies						
Describe medications used to control and treat asthma exacerbations						
Demonstrate how to correctly use an inhaler						
Describe and demonstrate how to obtain peak expiratory flow meter reading						
Understand and explain how to use an asthma action plan						

Appendix H. *Confidence Level Likert Scale*

Category	**Strongly Disagree 1**	**Disagree 2**	**Undecided 3**	**Agree 4**	**Strongly Agree 5**	**Total Score**
Able to explain asthma basics						
Identify triggers and help students develop avoidance strategies						
Describe medications used to control and treat asthma exacerbations						
Demonstrate how to correctly use an inhaler						
Describe and demonstrate how to obtain peak expiratory flow meter reading						
Understand and explain how to use an asthma action plan						

Explain importance of using an AAP, and demonstrate to students how to use AAP

Appendix I . *Process Evaluations*

Rate the significance of the following barriers to asthma management

Category	**No impact 1**	**Low impact 2**	**Undecided 3**	**Some Impact 4**	**High Impact 5**	**Total Score**
Lack of knowledge						
Limited support						
Limited resources						
Communication challenges						
Time constraints						
Lack of awareness of nurse's expertise						

As a result of the Kickin Asthma training and Implementation support, identify a strategy to implement the "E" educational component of the CDC's EXHALE program

As a result of the Kickin Asthma training and Implementation support identify one strategy to advocate for stock albuterol in their school setting during the implementation support period.

Process Evaluation

Category	**Strongly Agree 1**	**Agree 2**	**Undecided 3**	**Disagree 4**	**Strongly Disagree 5**	**Total Score**
How satisfied are you with the Kickin Asthma training						
How satisfied are you with the follow up implementation support						
Could the implementation support be improved with additional meetings						
Do you feel that the training and implementation support has prepared you to implement practice changes						
What additional asthma educational training could be offered to improve asthma outcomes in school health						

Appendix J. *Statement of Mutual Agreement*

Eastern Kentucky University
Doctor of Nursing Practice (DNP) Program
Statement of Mutual Agreement

The purpose of this document is describe the nature of the agreement for the Doctor of Nursing Practice (DNP) Project between:

Student Name: Dianna Hacker-Taylor
Partnering Organization Name: Asthma Management Program in Kentucky

This statement of mutual agreement is completed in the DNP Project planning phase as a precursor to the Institutional Review Board (IRB) and to show general organizational support for the DNP Project.

General Information: Proposed project goal is to improve asthma management Behaviors in Ky School nurses

DNP Project Title: Improving asthma management behaviors in School nurses through facilitator training + supported implementa

Partnering Organization:	**Name of Organization:** Asthma Management Program **Name of Organizational Contact:** Ms Rahel Basse **Phone:** 502-564-7993 **Email:** rahel.basse@ky.gov

Brief Description of the Project:
Practice gap in School nurse asthma Management

Identified Problem/Gap:	+ uncontrolled asthma in Pediatrics
Proposed Intervention(s):	Kickin Asthma Program
Proposed Evaluation of: • Outcomes • Process	Organizational Readiness Passing score @ 80% on Program Identify Barriers
Description of On-Site Activities: • Student's Role • Meetings • Access to Data	Scholarships to complete the Kickin asthma program will Be extended to up to 20 school nurses + implementation support will follow weeks for 4 weeks
Intellectual Property: • Ownership • Plans for Dissemination	Dianna Hacker-Taylor Poster presentation at the Ky National League of nursing + at the Ky School nurse conference

• Non-disclosure expectations • Publication Plans	*** All EKU DNP Projects will require at minimum a de-identified abstract to be uploaded into the digital repository as a marker of academic work.

Institutional Review Board:

EKU is the IRB of Record	The organization agrees to let EKU be the IRB of Record. ❑ Yes ☒ No ❑ Other: (Explain) ❑
Organization is the IRB of Record	The organization prefers to be the IRB of Record. ❑ Yes ☒ No ❑ Other: (Explain)

Other elements for clarification prior to implementation of the DNP Project. Describe.

DNP Student Signature: Diana Hacker-Taylor RN MSN CPNP FNP-BC
Date:

Partnering Organization's Signature: Rahul Bansal
Date:

EKU
DOCTOR OF NURSING PRACTICE

Eastern Kentucky University
Doctor of Nursing Practice (DNP) Program
Statement of Mutual Agreement

The purpose of this document is describe the nature of the agreement for the Doctor of Nursing Practice (DNP) Project between:
Student Name: Dianna Hacker-Taylor
Partnering Organization Name: American Lung Association

This statement of mutual agreement is completed in the DNP Project planning phase as a precursor to the Institutional Review Board (IRB) and to show general organizational support for the DNP Project.

General Information: Proposed project goal is to improve asthma Management Behaviors in Ky School nurses

DNP Project Title: Improving asthma Management Behaviors in School Nurses through Facilitator training + supported implementation

Partnering Organization:	Name of Organization: American Lung association Name of Organizational Contact: Barbara Kaplan MPH Phone: 202-715-3438 Email: barbara.Kaplan@lung.org

Brief Description of the Project:
Practice gap in School nurse asthma management +

Identified Problem/Gap:	Uncontrolled Asthma in Pediatrics-
Proposed Intervention(s):	Kickin asthma Program
Proposed Evaluation of: • Outcomes • Process	Organizational Readiness tool Posting score of 80% in program Identify Barriers
Description of On-Site Activities: • Student's Role • Meetings • Access to Data	Scholarships to complete the Kickin asthma program will be extended to up to 20 nurses + then implementation support will follow weekly for 4 weeks
Intellectual Property: • Ownership • Plans for Dissemination	Dianna Hacker-Taylor Poster presentation at the Ky national League of Nursing conference + at the Ky School nurse conference

• Non-disclosure expectations • Publication Plans	*** All EKU DNP Projects will require at minimum a de-identified abstract to be uploaded into the digital repository as a marker of academic work.

Institutional Review Board:

EKU is the IRB of Record	The organization agrees to let EKU be the IRB of Record. ☑ Yes ☐ No ☐ Other: (Explain) ☐
Organization is the IRB of Record	The organization prefers to be the IRB of Record. ☐ Yes ☑ No ☐ Other: (Explain)

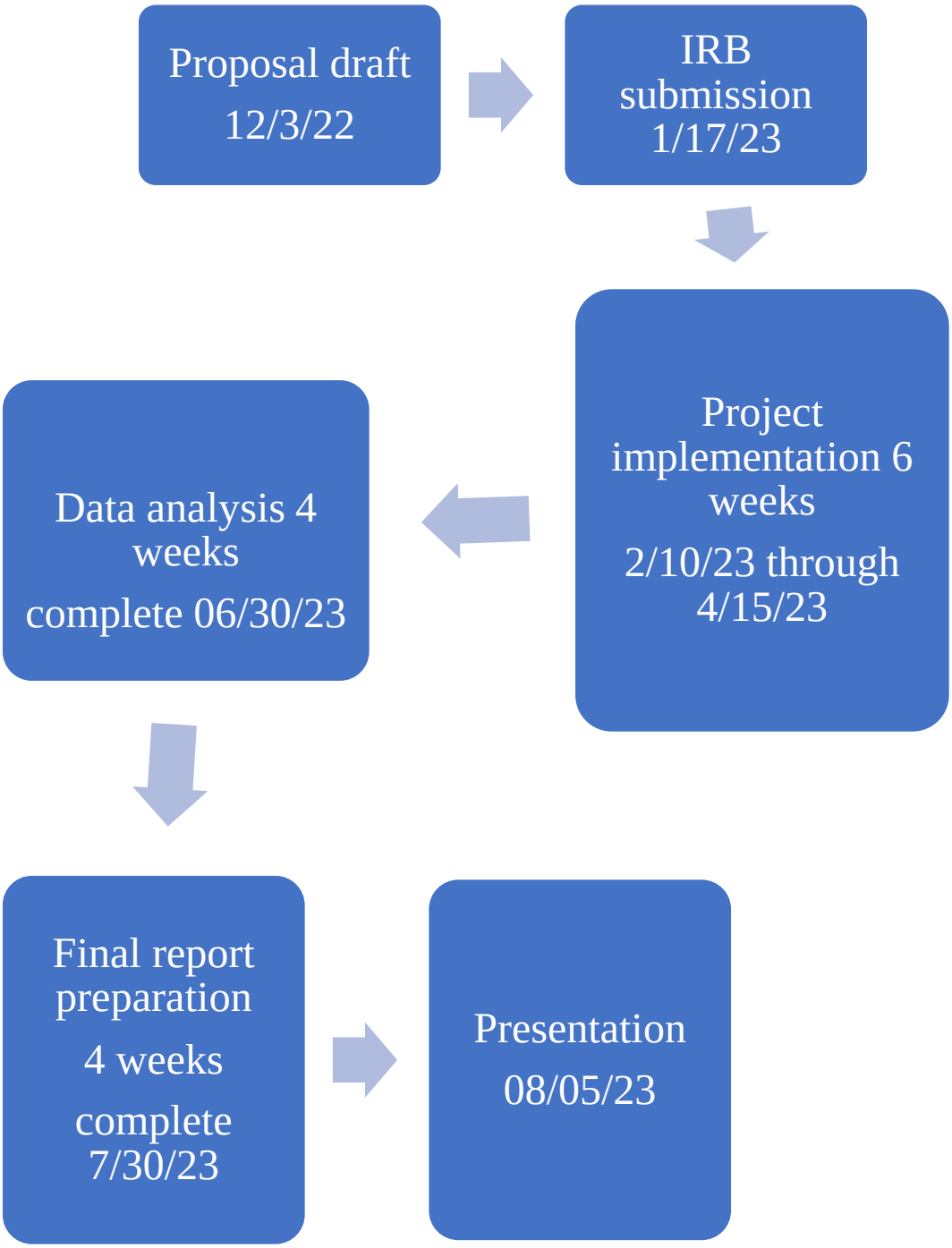
Other elements for clarification prior to implementation of the DNP Project. Describe.

DNP Student Signature: Dianna Hacker-Taylor RN MSN CPNP FNP-BC
Date:

Partnering Organization's Signature: Deborah P. Brown
Date: 11/15/22

EKU
DOCTOR OF NURSING PRACTICE

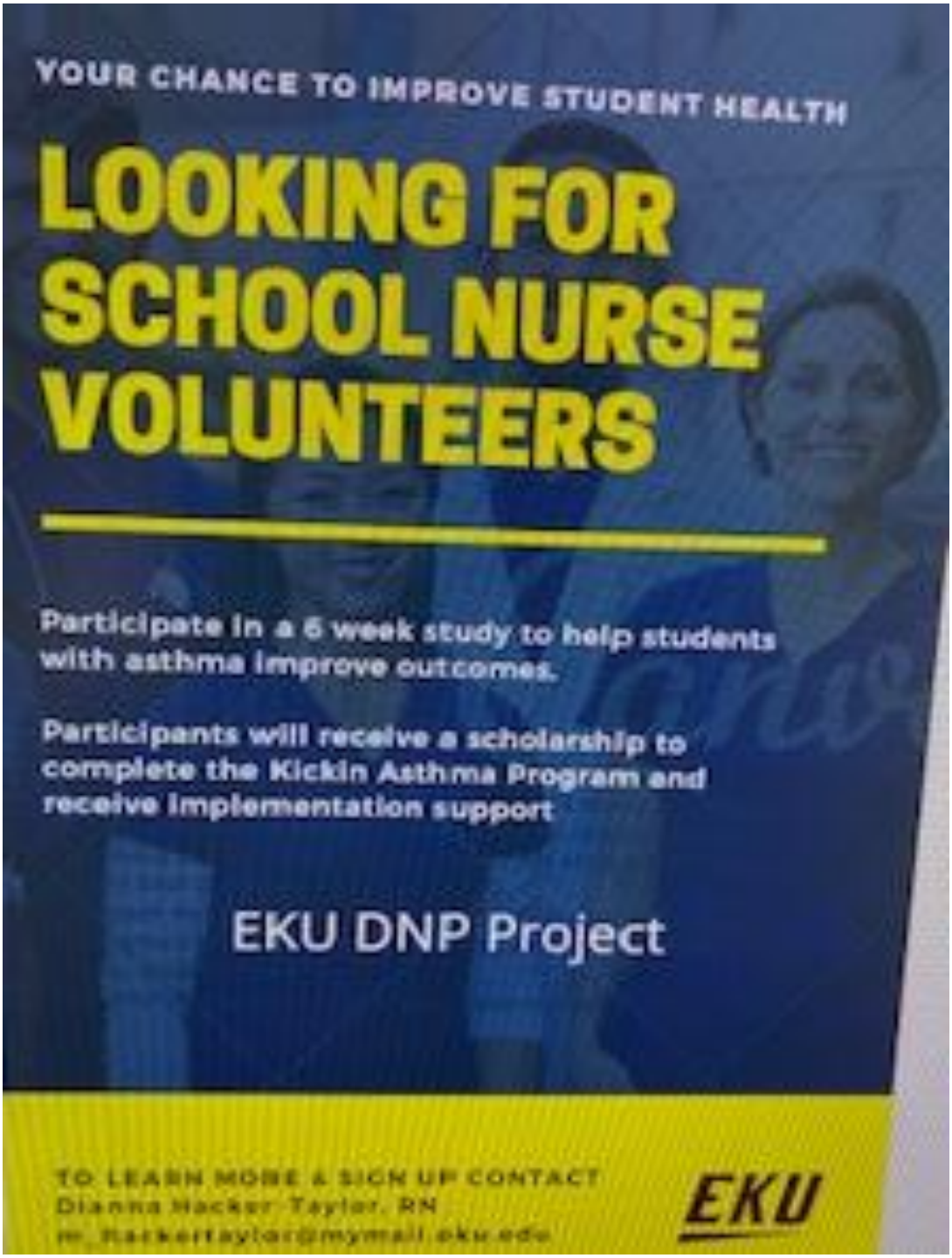
Appendix K. *Proposed Project Timeline*



Appendix L. *Budget for Proposal*

Item	**Budget**	**Actual Cost**
Labor (School Nurse)	Salary $25.00 /Hour Utilize Nurse 3 Hours / WK x 10 $750,00	No costs to complete project
Supplies (printing, flyers, ink cartridges, website Canva.com)	Printing: $100.00 Ink Cartridges $180.00 Canva.com website poster design and flyers $179.00 Total Costs: $459.00	Printing cost $22.00 Ink Cartridges $180,00 Subscription to Canva for three months $45.00 Total Costs: $247.00
SPSS Statistical Software purchase	Estimate $100.00	$50.00
Cell phone costs	$210.00	$210.00
Mileage	$ 58.5 per mile	Zoom calls completed for follow up implementation support. Costs $0
Asthma education seminar	$1000.00	Provided by the Kentucky Asthma Management Program
Kickin' Asthma scholarships were approved for 20 participants.	$8000,00	Kickin' Asthma training provided by the Kentucky Asthma Management Program through the CDC grant
	Estimated Total Costs $10,419.00	Total Actual Cost $507.00

Appendix M. *Recruitment Flyer*



Appendix N. *Recruitment Letter*

Recruitment Letter

February 8, 2023

Kentucky School Nurses

Recruitment Letter

RE: Improving Asthma Management Behaviors in School Nurses through Facilitator Training and Supported Implementation A DNP Project

Investigator: Dianna Hacker-Taylor RN MSN CPNP FNP-BC

Dear Kentucky School Nurse,

I am writing to let you know about an opportunity to participate in a quality improvement project to improve asthma outcomes in school health. My name is Dianna Hacker-Taylor, and I am a doctoral student at Eastern Kentucky University. As you know, uncontrolled asthma results in increased morbidity and school absenteeism. Consequences include poor academic performance as well as poor health outcomes. Kentucky school nurses spend a great deal of their day managing students with chronic health conditions such as asthma.

This DNP project is offered in collaboration with the Kentucky Asthma Management Program. The project is examining asthma management behaviors in school nurses. The aim of the project is to increase knowledge and confidence in school nurses. The project is recruiting up to 20 school nurses who meet eligibility requirements. Eligible participants will receive a $400.00 scholarship to complete the Kickin Asthma training developed by the American Lung Association. The scholarships will be offered from the Kentucky Asthma Management Program. Participants will be selected on a first come first serve basis.

In phase one participants will complete the Kickin Asthma online training and must achieve a passing score of 80%. The Kickin Asthma training consist of four online modules which take approximately 2 hours to complete. After completion of the online training, participants will schedule a follow up Microsoft Teams live call with the American Lung Association facilitator to receive their certificate. After completion of phase one training, Facilitators will receive a three-year certification with an option to recertify, a Facilitator Device Toolkit, access to the Kickin' Asthma Curriculum, and facilitator engagement and networking opportunities.

Implementation support will occur in phase two of the project and consist of a onetime follow up meeting via Zoom to discuss the following: educational component of the CDC EXHALE strategies, and benefits associated with a stock albuterol program, and barriers that hinder or prevent asthma management behaviors in school health clinics.

The anticipated start date will occur mid-February. Completion of phase one must occur by February 20th, 2023, and completion of the one-time follow up Zoom call meeting must occur no later than March 13th, 2023.

Eligibility requirements include the following:

- Participants must work with school-age students ages 11 through 16 years.
- Participants must complete both phase one and phase two of the project according to the designated time frame.
- Participants will complete the organizational readiness to implement change survey and the demographic survey prior to beginning the Kickin Asthma online training.
- Participants will complete the pre and post Likert surveys assessing knowledge, and confidence before and after the Kickin Asthma training.
- Participants will complete the Process evaluations at completion of phase two and identify one strategy to implement the educational component of the CDC's EXHALE program.
- Participants will identify one strategy to advocate for stock albuterol.

Your participation in this Project is voluntary, and participation serves as implied consent for the project. All data in this Project will be protected by encryption and two factor authentication. Data will be stored onto Microsoft Office 365 OneDrive Cloud storage and information will be shared with DNP faculty at Eastern Kentucky University.

Thank you for your participation!

Dianna Hacker-Taylor RN MSN CPNP FNP-BC

Appendix O. *Repeated Measures T test statistical analysis*

Knowledge

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	POST-K TOTAL	27.75	12	2.094	.605
	PRE-K TOTAL	22.58	12	4.295	1.240

Paired Samples Test

		Paired Differences					t	df
					95% Confidence Interval of the Difference			
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper		
Pair 1	POST-K TOTAL - PRE-K TOTAL	5.167	4.108	1.186	2.556	7.777	4.356	11

Paired Samples Test

		Significance	
		One-Sided p	Two-Sided p
Pair 1	POST-K TOTAL - PRE-K TOTAL	<.001	.001

Paired Samples Effect Sizes

					95% Confidence Interval	
			Standardizer[a]	Point Estimate	Lower	Upper
Pair 1	POST-K TOTAL - PRE-K TOTAL	Cohen's d	4.108	1.258	.475	2.010
		Hedges' correction	4.255	1.214	.458	1.941

Confidence

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	POST-C TOTAL	28.10	10	1.792	.567
	PRE-C TOTAL	21.70	10	3.713	1.174

Paired Samples Test

		Paired Differences					t	df
					95% Confidence Interval of the Difference			
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper		
Pair 1	POST-C TOTAL - PRE-C TOTAL	6.400	4.274	1.352	3.343	9.457	4.735	9

Paired Samples Test

		Significance	
		One-Sided p	Two-Sided p
Pair 1	POST-C TOTAL - PRE-C TOTAL	<.001	.001

Paired Samples Effect Sizes

					95% Confidence Interval	
			Standardizer[a]	Point Estimate	Lower	Upper
Pair 1	POST-C TOTAL - PRE-C TOTAL	Cohen's d	4.274	1.497	.559	2.400
		Hedges' correction	4.463	1.434	.535	2.298