EFFICACY OF AN EDUCATIONAL TOOL IMPLEMENTATION TO DECREASE RELAPSE UTILIZATION BY ASTHMA PATIENTS

by

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ABSTRACT

Asthma exacerbation patients often rely on emergency departments (ED) and urgent care or acute care clinic settings to regain control of their symptoms with almost 10% of asthmatic adults having an asthma related ED visit between 2011 and 2016 (Centers for Disease Control and Prevention [CDC], 2023). The Global Initiative for Asthma (GINA), encourages the utilization of self-management plans, such as an Asthma Action Plan (AAP), by patients as the first step of care in an asthma exacerbation (GINA, 2022).

10% of Montanans carry an asthma diagnosis and in 2018 with 2,000 ED visits related to asthma exacerbation treatment. The purpose of this project was to decrease relapse utilization of urgent care facilities by asthma exacerbation patients by implementing an educational tool to help increase utilization of AAPs and foster the patient-primary care provider relationship.

This project aimed to provide patients presenting to the urgent care a discharge packet containing an AAP and primary care resources upon visit completion to decrease relapse utilization of the urgent care setting by asthma patients. Additionally, the number asthma exacerbation patients presenting to the urgent care was to be monitored and with a focus on those presenting on more than one occasion. Additionally, barriers to implementation were evaluated.

The project aims of decreasing relapse urgent care utilization by asthma patients was inconclusive due to absence of data points available during the study timeline of relapse asthma exacerbation patients in comparison to the same 6-week timeframe from the prior year. However, this project illuminated significant gaps in what is recommended for asthma exacerbation patients and what this practice implements. Additionally, the lack of data also encouraged discussion regarding triggers to asthma exacerbation and encouraged comparing trackable triggers from the 2022-2023 season to the 2023-2024 season.

Interestingly, this project highlighted a need for further education and guideline-based training for system providers to align actual treatment of asthma patients more closely to guideline-suggested management of asthma patients. More data needs to be collected regarding the implementation of self-management tool impact on decreasing relapse utilization of urgent care facilities.

CHAPTER ONE

REVIEW OF THE LITERATURE

Introduction

Approximately 1 in 12 people in the US have asthma and it is the leading chronic illness in children (Centers for Disease Control and Prevention [CDC], 2023). The CDC (2023) estimates that between 2016 and 2018 the rate of emergency department (ED) visits for Acute Asthma events was 51.9 per 10,000 people. Additionally, it's estimated that 9.9% of adults with a diagnosis of asthma had an asthma related ED visit between 2011 and 2016 (CDC, 2023). The Global Initiative for Asthma (GINA) (2022) notes that following an ED visit for an asthma exacerbation, a follow up appointment with a primary care provider (PCP) should happen within 2-7 days for adults or 1-2 days for children. However, these follow up interactions appear to be delayed or fail to happen (Villa-Roel et al., 2016). Follow up with primary care allows for better evaluation of current treatment efficacy, ongoing patient education about their symptoms and disease course, and an opportunity for the patient to better understand their resources for managing their symptoms. While ED and nonemergent acute care settings can treat exacerbation symptoms, these setting have significant barriers such as time and resource constraints that prevent adequate patient education, and therefore hinder adequate asthma control in this patient population. GINA recommendations highlight the importance of healthcare provider-patient relationships in these settings where the goal is to help patients achieve long term symptom control through follow up with primary care providers (2022). While such recommendations are

echoed by GINA, the CDC, The American Lung Association, and Healthy People 2030 there is still an apparent lack of primary care usage by these patients.

Background and Significance

Makhinova et al. (2021) explain that asthma is one chronic condition where nonadherence to treatment is widespread, with less than 50% of controller medication adherence. In their study, Makhinova et al. (2021) examine barriers to adherence and find that a major theme corresponding to nonadherence is poor understanding and education about what a patient's medication plan treats and prevents and how the patient's care plan helps prevent exacerbation and improve quality of life. Interestingly, they found that the presence of an asthma action plan (AAP) was the only symptom management characteristic that improved adherence to their treatment plan; those with an AAP had 81.5% adherence compared to 76.6% adherence of those without an AAP (Makhinova et al., 2021). This particular study begins to demonstrate the importance of self-management tools, such as AAPs, in the long-term management of asthma patients.

Emergency departments (ED) and nonemergent acute care settings (such as urgent cares) are exceptional points of contact to identify exacerbations of chronic illnesses, such as asthma, that are more appropriately managed by a primary care provider. While EDs and acute care settings can treat symptoms of exacerbation, the primary care setting provides the time and follow-up necessary for the medication management, patient education, and treatment plan development needed for adequate asthma symptom management. GINA explains that along with pharmacologic measures, the presence of self-management tools such as AAPs developed with a primary care provider allows the patient to recognize and manage asthma exacerbation

symptoms and treat appropriately with their existing asthma medications (2022). Further, the patient is given metrics to monitor at home so that they have better understanding of what they are capable of treating on their own and what symptoms they should seek further care for (Global Initiative for Asthma [GINA], 2022). However, a 2022 study by Prigge et al. notes that an evaluation of a Midwest community showed that only 44% of adult patients actually had an AAP in place. There is an apparent gap in patient education (both initial and ongoing) and current practitioner practice that allows for patients who have a diagnosis of asthma to lack a self-management tool even though this treatment modality is encouraged by major health organizations (Makhinova et al, 2021, Akinbami et al., 2019).

GINA recommends that basic education be provided to the asthma exacerbation patient at the conclusion of the ED or acute care visit (2022). The care team should discuss potential triggers of the exacerbation and modifiable risk factors for future exacerbations, determine the patient's understanding of their medications and correct usage, and discuss symptoms to monitor for that would warrant further follow up either with their PCP or an acute care setting (Global Initiative for Asthma, 2022). Villa-Roel et al. (2016) note in their systemic review that focusing on educational recommendations, such as those listed above, alongside encouraging PCP follow up lead to a greater likelihood that follow up would actually occur for these patients. Despite major health organizations agreeing that increased education about self-management tools for asthma patients decreases symptom exacerbation and mortality (Akinbami et al., 2019; GINA, 2022; Office of Disease Prevention and Health Promotion [ODPHP], n.d.), the most recent publication of The U.S. Department of Health and Human Services National Health Statistics Report cite that AAPs were only discussed in 10% of asthma primary care visits and explain that

this level of education is suboptimal (Akinbami, L.J., 2019). This gap in patient education and treatment plan development by primary care providers is likely the cause for only 44% of adults (Villa-Roel et al., 2018) with asthma having an asthma action plan.

Literature Synthesis

Methods

The purpose of this literature review was to first explore and then understand the appropriate interventions for patients presenting to an urgent care with asthma exacerbations. An initial literature review of the databases PubMed, Web of Science, CINAHL, and Cochrane Library was conducted in September 2023 using the search terms “asthma”, “asthma referral”, “primary care”, “urgent care”, “acute care”, “emergency department”, “emergency room”, “asthma intervention”, and “asthma action plan”. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were used to determine inclusion and exclusion criteria for this review. Eligibility criteria included date of publication occurring after 2015, published in the English language, population of study to include adults, intervention to include patient education, and study site to include urgent cares or emergency departments. Searches were further limited to include systematic reviews, integrative reviews, meta-analysis, and quantitative studies. While this search yielded many studies reviewing pharmacologic interventions for asthma exacerbation, there are few existing studies examining strategies for improving the number of asthma patients who have self-management tools developed with a primary care provider.

This search resulted in a broad group of results, many of which were easily excluded through title screening. A total of 252 articles were found through the search and three found

through other sources. There were 253 after duplicates were removed and 246 were excluded based on the title and/or abstract. Seven articles were assessed for eligibility and four were excluded based on intervention used or population. Three articles met inclusion criteria for this review (Appendix B). A systematic review of 3 randomized controlled trials (Villa-Roel et al., 2018), an integrative review of 12 studies (Skene et al., 2023), a systematic review and meta-analysis of 5 studies (Villa-Roel et al., 2016), and a mixed methods study (Villa-Roel et al., 2018) are included in the following results.

Results

Nonpharmacologic Interventions for Asthma Patients

While the Global Initiative for Asthma (GINA) has clear recommendations for follow-up education and further care after an urgent care or ED visit, the studies reviewed explain that the environment of acute care settings does not always allow for such education due to time and resource constraints (Villa-Roel et al., 2016; Skene et al., 2023) and focuses on interventions to encourage follow up with a primary care provider for better asthma management and care plan development. Asthma Action Plans (AAPs) are recommended for all patients with an asthma diagnosis (GINA, 2022). Unfortunately, very few of the patients seen in emergency departments have one (Villa-Roel et al., 2018). AAPs show potential in their ability to help patients better manage their asthma symptoms at home with existing prescription medications, monitor for serious symptoms that would necessitate further follow-up, and encourage ongoing collaboration with primary care providers for long-term management of asthma. (Villa-Roel et al., 2016; Villa-Roel et al., 2018; Skene et al, 2023).

The Asthma Action Plan is tailored to each individual and can help those with asthma make short-term treatment modifications to best treat their current symptoms and monitor for symptoms that would require additional evaluation in an acute care setting (GINA, 2022). As this tool is tailored to patients and requires foundational education about the disease course and modifiable factors, it is not an appropriate intervention to fully implement in the nonemergent acute care setting (Skene et al., 2023; Villa-Roel et al., 2018). Skene et al (2023) note that self-management plans, such as AAPs reduce hospital admissions and ED visits. Patients who rely solely on the ED for their asthma care miss out on this disease education and implementation of the self-management tools, and therefore increase unscheduled use of the healthcare system (Villa-Roel et al., 2018).

Villa-Roel et al (2018) discuss the application of the AAP in the ED setting and study its efficacy. They found that across two randomized control trials studied, rates of readmission to the ED among patients who were simply provided an AAP at the ED did not change (Villa-Roel et al, 2018). The authors of the study explain that the sample sizes and study numbers were small, which likely had an impact on the findings. This review highlighted a similar inconclusive result when their review of a RCT failed to show a reduction in relapses of acute asthma exacerbation patients presenting to the ED. However, when provided asthma education in the ED including a preliminary AAP, patients had an increased likelihood of follow up with their primary care provider (Villa-Roel et al., 2018). While the education provided in the acute care setting increased PCP usage, it failed to demonstrate a decrease of acute care usage by asthma patients. These results indicate a gap in available information and adequate studies done regarding AAP as an effective intervention in the emergency setting but do endorse the AAP's use alongside robust

patient education to encourage a stronger patient-PCP collaboration in managing asthma (Villa-Roel et al., 2018; Skene et al., 2023; Villa-Roel et al., 2016).

Educational Barriers and Opportunities

The discussed inability to decrease relapses of acute asthma presenting to the ED may be attributed to external influences such as accessing prescriptions or lack of educational programs, specifically in groups who have poor access to healthcare or are noncompliant (Villa-Roel et al., 2018). Skene et al. (2023) explains that patients who frequently utilize acute care for asthma treatment tend to be young, female, have a lower socioeconomic status, and belong to a minority population. Implementing basic self-management education to asthma patients when they initially present to the acute setting with exacerbation symptoms presents what Skene et al. deem a "reachable and teachable" moment (2023). In other words, while the acute care setting is not appropriate for *complete* asthma education, introducing and stressing the importance of self-management strategies such as the AAP when patients present to the acute care setting allows providers to begin the conversation that should then be completed in the primary care setting (Skene et al., 2023).

Primary care follow-up after an acute care visit for asthma exacerbation is one of the primary recommendations from GINA (2022). Villa-Roel et al. investigated methods to improve this linkage between the patient and their primary care provider in their 2016 systematic review. The biggest effect they found was from directly following up with either the patient or the provider to facilitate an appointment to establish an asthma action plan and further review their current medication efficacy and/or compliance with their current plan (Villa-Roel et al., 2016).

Education provided in the ED in the form of an asthma action plan was credited with increasing primary care follow ups in this review (Villa-Roel et al., 2016).

Conclusion

Asthma accounts for almost 1 million ED visits, nearly 100,000 hospital stays, and about 3500 deaths annually (CDC 2023). Better management of this illnesses may have the potential to improve outcomes, decrease unnecessary hospital visits, and achieve more adequate control over asthma symptoms. Self-management is a crucial and a proven mechanism for establishing and maintaining asthma control for patients working with primary care providers (GINA, 2022). However, it seems there is a gap between what is understood to be best practice for the care of these patients and what has occurred in their asthma care history. Additionally, there is a noted gap in reviews examining appropriate interventions to improve long term control for asthma patients in the acute care setting. While conducting this search, the gap in available recent studies examining effective measures to increase asthma patient utilization of primary care and self-management tools became abundantly clear by simply examining the scant volume of applicable research.

Asthma action plans show promise in encouraging ongoing patient collaboration with primary care providers, though more research needs to be done to establish if AAPs decrease acute care utilization by this population (Skene et al., 2023; Villa-Roel et al, 2018). Society guidelines recommend AAPs for every individual with asthma (CDC, 2023; GINA, 2022; ODPHP; n.d.-a), yet there is minimal research examining their efficacy on decreasing usage of emergency departments and urgent care settings. Existing research lays a framework in which to study interventions that may improve primary care utilization by asthma patients. Providing

education to asthma exacerbation patients in the acute care setting is a standardizable and measurable intervention to increase use of primary care providers and decrease reliance on acute care for chronic symptom management (Skene et al., 2023; Villa-Roel et al., 2016; Villa-Roel et al., 2018).

Improving educational resources for acute asthma patients can be merged into existing discharge procedures for patients presenting to acute care settings. Villa-Roel et al (2018) explain that patients receiving discharge education had higher rates of connecting with their primary care providers after acute exacerbation. Providing patients an AAP outline and basic asthma education can set patients up to continue a productive conversation with their primary care provider and further develop and refine their self-management tools to manage their asthma at home (Skene et al., 2023; GINA, 2022). Further encouraging them to follow up with their primary care provider or establishing care with a new PCP facilitates the continuation of care plan development and directs that development to a better-equipped setting. While there is insufficient evidence to suggest that this intervention alone can reduce hospital admissions and asthma exacerbation relapse, this intervention presents an opportunity to collect more information to expand the understanding of AAPs on asthma symptom control that exists. By monitoring rates of asthma relapse to the acute care setting with the educational intervention in place and comparing to pre-intervention rates, we can better understand the implication of AAP implementation for this patient population and the implementing hospital system.

CHAPTER TWO

PROJECT PROPOSAL FOR EDUCATIONAL INTERVENTION WITH ASTHMA EXACERBATION PATIENTS

Introduction

Poorly controlled asthma poses burdens to health care systems as it results in an increase in usage of emergency departments (ED) and urgent care facilities when patients have exacerbations. The CDC reports that asthma was responsible for approximately 1 million ED visits in the last year (Centers for Disease Control and Prevention [CDC], 2023). The Global Initiative for Asthma (GINA), notes that these exacerbations place a significant burden on society due to decrease in work/life productivity and create disruptions for affected families (2022). In 2021, 39.6% of adults with asthma had an asthma attack and 27.8% of adults with asthma required an ED visit (CDC, 2023). The Montana Department of Public Health and Human Services (DPHHS) notes that in 2019, the rate of adults in the state with asthma was 10%; similar to the U.S. rate of 9% and caused over 2,000 ED visits in 2018 (Dunthie et al., 2021).

Access to primary care allows individuals to have a “usual source of care” which allows them to have better early detection, and therefore treatment, of a disease, higher rates of vaccination, better health outcomes, and better management and control over chronic illnesses such as asthma (ODPHP, n.d.-a). While there is an understanding that having a “usual source of care” or primary care provider, only 77.7% of American Adults had an annual wellness visit in 2022. One goal of Healthy People 2030 is to “reduce emergency department visits for people 5

years and older with asthma" citing a goal of 40.2 ED visits per 10,000, which would be a decrease from the current rate of 49.6 ED visits per 10,000 (ODPHP, n.d.-a). Asthma is a chronic illness which requires regular management for optimal outcomes such as symptom management, medication management, and care planning. GINA defines the long-term goals of asthma management as "to achieve good symptom control, minimize future risk of asthma-related mortality, exacerbations, persistent airflow limitation, and potential side-effects of treatment" (2022). Regular primary care involvement in individuals with asthma allows for the development of asthma action plans (AAPs), development of asthma-related health goals, and identification of asthma triggers (Bansal et al., 2023).

The use of AAPs is supported by the CDC, GINA, The American Lung Association (ALA), and other major respiratory-focused organizations (CDC, 2023; GINA, 2022; American Lung Association [ALA], n.d.). Collaboration between the primary care provider and the patient in the development of the AAP is necessary for proper evaluation of asthma symptoms, triggers, maintenance medications, and rescue medications. While the importance of the asthma action plan in reduction of asthma exacerbations is well described by GINA and the CDC, Villa-Roel et al. (2018) note that very few patients presenting to the ED with asthma exacerbations actually have an AAP that's been developed alongside their physician. Skein et al. (2023) describe the lack of follow-up with primary care after an ED visit for exacerbation of asthma symptoms. AAPs allow patients to self-monitor and self-treat mild asthma symptoms at home while providing the patient specific symptom parameters and treatment modalities to follow. The AAP also provides parameters of symptoms to monitor and parameters for seeking additional care (GINA, 2022; CDC, 2023). AAPs have the potential to decrease unneeded utilization of the acute

care setting when properly developed and applied by laying out specific guidelines for self-management and empowering patients to take control of their disease process and symptoms,

Problem Statement

The current problem is that asthma patients who do not have an asthma action plan developed with a PCP are often forced to utilize emergency departments and acute care clinics to manage their asthma symptoms (Viella-Roel et al., 2016). After an asthma-triggering event such as an upper respiratory illness, poor air quality, or exposure to an allergen, asthma patients may experience an increase in symptoms such as wheezing, shortness of breath, dyspnea, cough, and chest tightness (GINA, 2022; Fanta et al., 2022). Without the education and guidelines provided in an asthma action plan, patients may find themselves relying on acute care for treatment of their exacerbation symptoms. This utilization is witnessed at a rural hospital's urgent care clinic in western Montana. This location sees many patients presenting with complaints of wheezing and increased difficulty breathing. These patients often have an asthma diagnosis but lack a current asthma action plan. Currently at this facility there is no standardized discharge education established for patients presenting with asthma exacerbation.

A Skein et al. (2023) integrative review suggests providing educational materials in the acute care setting prior to discharge may have the potential to improve asthma outcomes. Viella Roel et al. (2018) note that more data needs to be collected to determine whether the presence of an AAP decreases the rates of asthma exacerbation relapse in asthma patients but found that asthma patients receiving discharge education after exacerbation had higher rates of primary care follow up. The importance of primary care in asthma symptom control and management is well established (GINA, 2022; ALA, n.d.; CDC, 2023); if primary care utilization and AAPs helps

patients gain and maintain control of asthma symptoms, asthma action plans utilization can help patients avoid relying on the acute care setting for exacerbation symptoms as they are able to better self-manage their symptoms at home (GINA, 2022; ODPHP, n.d.-a).

The proposed intervention is to identify and then provide 100% of the patients presenting to this acute care setting with symptoms of asthma exacerbation an "asthma discharge packet" at the end of their urgent care visit and provide brief education about the packet contents. The packet will include a sample asthma action plan (developed and published by the CDC), written education on the importance of an asthma action plan, and a list of local primary care providers with whom patients may further develop their action plan. The aim of this intervention is to monitor how AAP education and encouraging PCP follow up affects the number of asthma exacerbation relapse patients seen in this acute care setting.

Organizational Microsystem Assessment

This DNP project will take place at a rural urgent care facility located in rural western Montana. The city that this facility serves has a population of 1,955, but is located among a valley of similarly sized communities and serves as a county healthcare hub serving a county with 32,853 residents. This facility takes walk-in patients that are clinically stable enough to bypass the adjoining emergency department, but ill enough that they likely cannot wait to be seen by their primary care provider, if they have an established PCP. Patients are from a variety of ethnic and socioeconomic backgrounds. There is one Advanced Practice Provider (APP) (Physician's Associate or Nurse practitioner) present each day to provide care to approximately 20-30 patients daily with one or two nursing staff to help triage, room, and assist patients. Last year, in a six-week timeframe between February 2023 and April 2023, this site saw 16 patients

presenting with symptoms of asthma exacerbation with six of those patients presenting on more than one occasion for asthma exacerbation symptoms (Sampsel, personal communication, 2023). There is no current standardized procedure or discharge material for this patient population to prevent relapse events of asthma exacerbation, provide asthma education, or encourage follow up with a primary care provider. Current practice at this site is to treat symptoms of asthma exacerbation as needed and then discharge with appropriate medications. Discharge education about asthma action plans or encouraging patients to establish with a primary care provider for better asthma control currently lack at this facility.

Quality Improvement Model

The Quality Improvement Model utilized to study the impact of the proposed intervention will be the Plan-Do-Study-Act (PDSA) model. This model allows intervention development which is guided by the evidence reviewed in Chapter 1, site information, and stake holder feedback (Plan). After implementation (Do), the outcomes can be evaluated (Study), and further recommendations will be made (Act) based on the information gathered (Institute for Healthcare Improvement [IHI], 2017). Over the six-week timeframe, three distinct two-week PDSA cycles will occur. At the end of each cycle, the site provider will have a formal opportunity to provide feedback on barriers to implementation, patient reception to the intervention, and identify potential threats to future implementation. The site provider will also have the opportunity to ask any clarifying questions during these meetings.

Plan-Do-Study-Act Process

Plan: The intervention site was identified through an existing student-location/provider relationship. A needs assessment was conducted via observation and discussion with the provider. This revealed that there is no standardized discharge procedure for patients presenting with asthma exacerbation despite the provider reporting that many of the asthma patients seen with exacerbation symptoms do not report having an asthma action plan. Support from stakeholders for this educational intervention was established after discussing potential educational interventions that could be provided to asthma exacerbation patients presenting to this acute care setting. Initial research revealed that the presence of an asthma action plan is encouraged for every asthma patient by GINA and the CDC (2022, 2023). However, this site does not have the time resources to develop an AAP with each asthma patient presenting to the urgent care. Further discussion with the site provider revealed that presenting the AAP outline along with brief education and a list of primary care providers in the area that are accepting new patients would be a viable educational option for this population.

Do: The educational "asthma discharge packet" will be provided to every adult patient presenting to this acute care setting with 1) an existing diagnosis of asthma and 2) symptoms of asthma exacerbation. The number of patients returning to the site on more than one occasion for exacerbation symptoms during the study timeline (asthma exacerbation relapse) will be collected.

Study: The number of asthma exacerbation patients presenting to the urgent care will be collected as well as the number of relapse asthma exacerbation patients presenting to the urgent care will be compared to the previous year's data from the same time frame. Differences in

percentages will be noted. Themes such as patient reaction to education and provider's feelings about the intervention will also be collected and monitored.

Act: The results of this intervention will be collected and analyzed and will then be provided to the site regarding whether this intervention had an impact on relapse asthma exacerbation patients seen in the urgent care. Recommendations will be made based on the results. Monitoring for and noting emerging themes will also guide understanding of patient reception to the intervention, potential modifications to the intervention needed, and provider perception about intervention efficacy.

After each two-week PDSA cycle, the quantitative data collected in discussion with the site provider will guide any needed adjustments to the intervention implementation. The goal of each PDSA cycle is to enhance the next cycle by addressing any barriers or threats to implementation.

Purpose Statement

The purpose of this quality improvement implementation is to decrease relapse utilization rates of an acute care setting in rural western Montana by asthma exacerbation patients by providing evidence-based and community guideline supported educational material (GINA, 2022; CDC, 2023, ALA; n.d.). Efficacy of this QI project will be evaluated by comparing the number of asthma exacerbation patients seen by the urgent care setting between February 2023 and April 2023 (pre-intervention) to the same metric percentage between February 2024 and April 2024 (during intervention). Observing patients' reception of the intervention and reviewing the site provider's feelings of the intervention implementation will allow for the identification,

comparison, and evaluation of themes that arise during the intervention. This qualitative data will also serve to enhance each PDSA cycle.

As discussed previously, providing patients with discharge asthma education and asthma action plan outlines has the potential to increase utilization of primary care for chronic illness management (Skene et al, 2023; Akinbami, 2019; Viella-Roel et al., 2018). More data needs to be collected to ascertain whether discharge education and AAP distribution decreases instances of asthma exacerbation relapse (Viella-Roel et al., 2016; Viella-Roel et al., 2018). A secondary aim of this project is to begin to understand the existing gap in information about this impact and contribute to the body of information on this topic that exists already.

Methods

Implementation Summary

The implementation of the proposed intervention will be a six-week interval between February 2024 and April 2024. This time frame was discussed and determined to be a particularly high-volume time for asthma exacerbation patients as it coincides with a period of high-volume community-acquired upper respiratory illnesses (URIs). URIs are often triggers for asthma exacerbation symptoms (GINA, 2022; CDC, 2022; ALA; n.d.). Initial steps for intervention implementation are to identify asthma exacerbation symptoms in incoming patients. These symptoms include wheezing, shortness of breath, chest tightness, coughing, difficulty breathing, waking at night due to asthma symptoms, or difficulty doing normal activities (GINA, 2022; Fanta et al., 2023). Once identified, the patient will be treated as seen appropriate by the provider to achieve adequate symptom control for safe discharge. During discharge and as part of their discharge information, the provider will give the patient an informational “asthma discharge

packet" including the CDC Asthma Action Plan outline (APPENDIX C), a description of why developing an AAP with their PCP is important, and a list of primary care providers in the area to include names, addresses, and contact information. The provider will review this information with the patient and take time to answer questions. Intervention success will be measured by comparing the percentage of asthma exacerbation patients who return to the site on more than one occasion during the intervention timeframe to the same metric from the same time frame in the previous year. The goal of this quality improvement intervention is to decrease asthma relapse rate at this clinical site by providing educational material to asthma exacerbation patients.

Intervention and Implementation

The goal of this project is to decrease asthma exacerbation relapse rates by 100% at the chosen clinical site in comparison to the same time frame from the prior year by dispersing educational materials to identified asthma exacerbation patients between February 2024 and April 2024 and to encourage follow up with their primary care provider. The asthma discharge packet will include an asthma action plan sample, education about the importance of the asthma action plan, and a detailed contact sheet of primary care providers in the area. Once distributed, the provider will utilize a canned response (dot phrase) in his discharge summary electronic health record (EHR) documentation for the patient to provide evidence that the information was given. This dot phrase will allow for future data collection by the site's IT representative to compare the number of asthma exacerbation patients treated to the number of those patients who received the asthma discharge packet.

The specific education provided to patients in the asthma discharge packet are published by the CDC and is strongly based off the recommendations published by GINA (2023, 2022).

This includes the asthma action plan recommended by GINA (2022), the CDC (2023), ALA (n.d.), and studied by the research discussed prior (Viella-Roel et al., 2018; Viella-Roel et al., 2016; Skene et al., 2023; Akinbami et al., 2019). While these reviews discuss the AAPs promise in promoting primary care follow up of asthma symptoms by asthma patients, there is noted gaps in sufficient evidence for the tool's ability to decrease asthma exacerbation relapse. A secondary goal is to contribute to the existing body of evidence and better understand the AAPs implication in preventing acute care utilization by asthma exacerbation patients.

Regularly scheduled, biweekly meetings with the site provider will allow him to provide feedback on how he believes the intervention is being received by patients, if it is burdensome to implement, how he generally feels the intervention is proceeding, and allow time for him to provide feedback. This DNP student will also be at the site for 135 hours dispersed throughout the intervention timeline to assist with the distribution of materials, treatment of patients, and to observe for barriers to implementation. Additionally, monthly meetings with the site information technology representative (IT), will allow intermittent data collection to compare the 2023 data to the 2024 data and note any change in asthma exacerbation relapse rates between the two timeframes. Patient health information that would identify individuals is not needed to review and interpret the data collected for this project, which will consist of percentages and generalized themes with no ties to specific patient information.

Evaluation and Analysis

There will be regular biweekly check ins with the provider at this urgent care setting to evaluate rates of intervention implementation and reevaluate barriers to implementing the intervention. Monthly check-ins will also take place with an information technologist in the

facility to pull data and compare to the same time frame of the prior year. The outcome measured will be relapse rates (% of relapse) of asthma exacerbation patients during the intervention (February 2024 to April 2024). This percentage will be compared to the percentage of asthma exacerbation relapse patients seen in the same time frame of the previous year (February 2023 to April 2023). For this intervention, "relapse" is defined as a patient returning to the urgent care facility or adjoining emergency department at any time during the intervention implementation timeline with symptoms of asthma exacerbation on more than one occasion. Comparative statistics will compare the total number of asthma exacerbation patients will be to the asthma relapse patients.

Notes from the scheduled meetings with the site provider will be regularly evaluated for emerging themes regarding patient response to intervention, time burden for intervention implementation, and provider feelings on how the intervention is progressing. These results will be pooled and reported qualitatively.

Safety and Confidentiality

The care the patients will receive during this intervention will not change, and therefore, the QI implementation will not increase risk to patients. Patients may choose to utilize the information regarding the AAP and list of primary care providers or may choose to discard, ensuring voluntary participation. They may also choose to disregard or refuse the additional educational materials. Data pulled by the IT technologist will contain patient data, however this patient data will not be transmitted to this DNP student. Therefore, this DNP student's utilization of the data will exclusively include number of patients identified as asthma exacerbation, and

percentage of asthma exacerbation relapse. Patient information will not be utilized in any portion of this project by this DNP student.

CHAPTER THREE

QUALITY IMPROVEMENT MANUSCRIPT

Contribution of Authors and Co-Authors

Manuscript in Chapter 3

Author: Cicily G. Webb

Contributions: Project development, implementation, data collection

Co-Author: Dr. Alice Running

Contributions: Advising, editing

Manuscript Information

Cicily G. Webb and Dr. Alice Running

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Abstract

Background

Asthma exacerbation patients often rely on emergency departments (ED) and urgent care or acute care clinic settings to regain control of their symptoms with almost 10% of asthmatic adults having an asthma related ED visit between 2011 and 2016 (Centers for Disease Control and Prevention [CDC], 2023). The Global Initiative for Asthma (GINA), encourage the utilization of self-management plans, such as an Asthma Action Plan (AAP), by patients as the first step of care in an asthma exacerbation (GINA, 2022).

Local Problem

Approximately 10% of Montanans carry an asthma diagnosis and in 2018, 2,000 ED visits were related to asthma exacerbation treatment. The purpose of this project was to decrease relapse utilization of urgent care facilities by asthma exacerbation patients by implementing an educational tool to help increase utilization of AAPs and foster the patient-primary care provider relationship.

Methods

Provide patients presenting to the urgent care a discharge packet containing an AAP and primary care resources upon visit completion to decrease relapse utilization of the urgent care setting by asthma patients. Monitor number of asthma exacerbation patients presenting to the urgent care and note those presenting on more than one occasion via electronic health record search with site's IT representative. Additionally, evaluate developing barriers to implementation and discuss considerations for future practice.

Interventions

Identify adults with asthma exacerbation patients presenting to the site's urgent care. Provide standardized discharge information to asthma exacerbation patients including a sample AAP, a list of local primary care providers (PCP), and a discussion regarding the importance of AAP development with the PCP in asthma management.

Results

The project aims of decreasing relapse urgent care utilization by asthma patients was inconclusive due to absence of data points available during the study timeline of relapse asthma exacerbation patients in comparison to the same 6-week timeframe from the prior year. However, this project illuminated significant gaps in what is recommended for asthma exacerbation patients and what this practice implements.

Conclusion

While there was an absence of data to compare to prior years at this clinical site, this project provided highlighted a need for further education and guideline-based training for system providers to align actual treatment of asthma patients more closely to guideline-suggested management of asthma patients. Additionally, the lack of data collected prompted further investigation into trackable asthma triggers that may have impacted the data collected during this time frame in comparison to the data from the previous season's identical time frame. More data needs to be collected regarding the implementation of self-management tool impact on decreasing relapse utilization of urgent care facilities.

Introduction

Asthma exacerbation patients often rely on emergency departments (ED) and urgent care or acute care clinic settings to regain control of their symptoms with almost 10% of asthmatic adults having an asthma related ED visit between 2011 and 2016 (Centers for Disease Control and Prevention [CDC], 2023). The CDC reports that approximately 1 million ED visits in 2022 were due to asthma symptoms. Almost twenty seven percent of adults with asthma had an attack/exacerbation severe enough in 2021 that an ED visit was warranted (CDC, 2023). Montana reports similar rates of asthma to the rest of the country with 10% of adults carrying the diagnosis and approximately 2,000 ED visits attributed to asthma care in 2018 (Montana Department of Public Health and Human Services [DPHHS], 2019).

The Global Initiative for Asthma (GINA) encourages the utilization of self-management plans, such as an Asthma Action Plan (AAP), by patients as the first step of care in an asthma exacerbation (2022). The CDC and GINA have similar published self-management tools called Asthma Action Plans (AAPs) which are designed to allow providers to walk the patient through their care plan when they are experiencing symptoms of asthma exacerbation (CDC, 2023; GINA, 2022). These plans lay out specific symptoms, spirometry measurements, and medication regimens for acute asthma exacerbation while also providing parameters that warrant additional evaluation in an acute care setting. The site for this quality improvement project did not have standardized discharge procedures for patients presenting for asthma exacerbation at time of project implementation. This project initially aimed to identify individuals presenting with asthma exacerbation and ensure that they receive an asthma discharge packet which includes a list of local primary care providers for follow up, an outline of the asthma action plan, given with

a discussion regarding the importance of developing an AAP in the self-management of asthma symptoms.

Literature Review

GINA cites self-management techniques as a proven mechanism for establishment and maintenance of asthma control (GINA, 2022). The literature reviewed indicat~~ed a~~ gap in available knowledge in what is best practice for the care of asthma patients and what occurs in asthma care history. This includes a lack of investigation regarding interventions to improve long term control for asthma patients in the acute care setting.

Studies by Skene et al. (2023) and Villa-Roel at al. (2018) demonstrated that AAPs can be used to encourage ongoing patient collaboration with PCP by asthma patients. While society guidelines recommend AAPs for every asthmatic individual, a 2022 study by Prigge et al. notes that in their study, only 44% of adult asthma patients had a self-management tool in place. There is a gap in initial and ongoing patient education that fails to recognize and implement an AAPs as encouraged by health organizations (Makhinova et al., 2021; Akinbami et al., 2019).

The literature reviewed explained that the acute care setting does not allow for AAP development and implementation due to time and resource constraints (Villa-Roel et al., 2016; Skene et al., 2023) and encourages PCP follow up for better management. A 2018 study by Villa-Roel et al. found that PCP follow up after an acute care visit by a patient having asthma exacerbation symptoms increased when that patient was provided a preliminary AAP and education on discharge.

Conceptual Framework

The Plan-Do-Study-Act framework was utilized for this project. This framework allowed three two-week cycles of intervention implementation. At the end of each two-week cycle, the provider was able to identify barriers to implementation and recommendations moving forward. These recommendations were taken into consideration, implemented when possible, and then the two-week cycle repeated.

Rational and Aims

The goal of this quality improvement process was to decrease relapse utilization of the acute care setting by asthma exacerbation patients at this clinical site when compared to the same time of the prior year. Additionally, this QI process gathered useful qualitative information to add to the existing body of information regarding discharge education efficacy for asthma exacerbation patients in the acute and urgent care setting.

Methods

Context

This project took place in a rural urgent care facility in rural western Montana that serves a population of approximately 32,033 people. The clinic is located across the hall from the local emergency department and takes patients who are ill or injured and are clinically stable enough to bypass emergency services. When patients present to the clinic, they are checked in by a registration personnel and then a nurse does an intake triage to determine whether they are stable enough to present to the urgent care or if they require the emergency department. They are then roomed and cared for by the provider. There is one provider on staff per day and between one

and two nurses triaging patients. Care is provided to between 15 and 25 patients per day. During the previous season's study timeframe, between February 2023 and April 2023, this clinical location had a total of 16 asthma exacerbation patients with 6 patients returning to the clinic more than once for asthma exacerbation symptoms (J. Sampsel, personal communication, September 8, 2023)

Intervention

For this project, every adult patient presenting to the clinical site between February 20, 2024 and April 2, 2024 with an asthma diagnosis and symptoms of exacerbation was provided an asthma discharge packet upon visit completion. A dot-phrase was added to the provider's note to make identification of patients receiving the packets simpler to track. The number of patients returning to the site on more than one occasion were measure by this doctoral student and an IT representative utilizing chart review. The discharge education provided to patients is a published AAP by the CDC and based off the recommendations provided by GINA (2023, 2022).

Biweekly meetings with the site provider were scheduled in advance to allowed discussion regarding the intervention reception by patients, implementation issues/concerns, and general thoughts about how the intervention was progressing. Monthly contact with the IT representative allowed intermittent quantitative data collection regarding number of patients presenting with asthma exacerbation, number of patients who received the asthma discharge packet, and number of patients who presented on more than one occasion during the study time frame with asthma exacerbation symptoms. However, as there were no patients presenting with symptoms of asthma exacerbation during the study timeframe, the biweekly meetings with the

site provider instead investigated potential causes for a lack of asthma exacerbation patients and identified a knowledge and practice variance from guideline suggestions.

Measures and Analysis

The first aim of decreasing relapse utilization of urgent care by asthma exacerbation was to be measured comparing total number of patients returning to the site on more than one occasion with asthma exacerbation during the study timeframe to the same timeframe of the previous year. The second aim of contributing to the existing body of data regarding asthma discharge education was fulfilled by collecting and reporting on themes and concepts that arose during meetings with the site provider. Additionally, themes and issues with the treatment of asthma patients in the acute care setting were gathered.

Results

During the six-week interval of data collection, no patients matching inclusion criteria (adult with an existing asthma diagnosis) presented to this site with symptoms of asthma exacerbation. As such, the rate of asthma exacerbation relapse was not able to be compared to the prior year during the same time frame. Zero asthma discharge packets were provided to patients and there was a 0% incidence of relapse utilization of urgent care by asthma patients. This compares to 6 of the 16 patients, or 37.5% seen for asthma exacerbation in the same time frame from the previous year having relapse utilization of the urgent care setting (J. Sampsel, personal communication, September 8, 2023, April 8, 2023). Biweekly meetings with the site provider revealed no apparent barriers to implementation. However, the provider upon initial intervention implementation explained that he had poor understanding of self-management tools for asthma

patients and was not aware of other providers at the site or within the care system utilizing such discharge education. It was determined that a longer time frame would have allowed for more data collection.

While the volume of quantitative data collected during this 6-week intervention was limited, this project did illuminate a marked practice gap in the treatment of asthma exacerbation patients versus what is suggested by GINA, the CDC, and The ALA. The provider at this site noted that self-management tools for asthma patients were not routinely utilized in the site's primary care clinics. In fact, he noted that he had not seen AAPs utilized for any adult asthma patients. Meetings with the site provider indicated that there was likely a need for better education of himself and other providers about what guidelines recommend for primary care management of adult asthma patients, including utilization of AAPs.

Limitations to this study include inability to identify patients who presented to an outside facility with asthma exacerbation relapse not captured by this project site as well as applicability to populations with different characteristics from this site. Additionally, had there been data collected in this project, the sample size of participants who met inclusion criteria for this project may not adequately reflect success rates of decreasing relapse asthma exacerbation visits if studied in a larger population over a greater time-period.

Discussion

This QI project examined a low-complexity educational intervention for asthma exacerbation on reducing asthma exacerbation relapse rates in the acute care setting by increasing the utilization of AAPs and collaboration between PCPs and patients. Additionally, it adds to the existing body of available information regarding asthma discharge education to

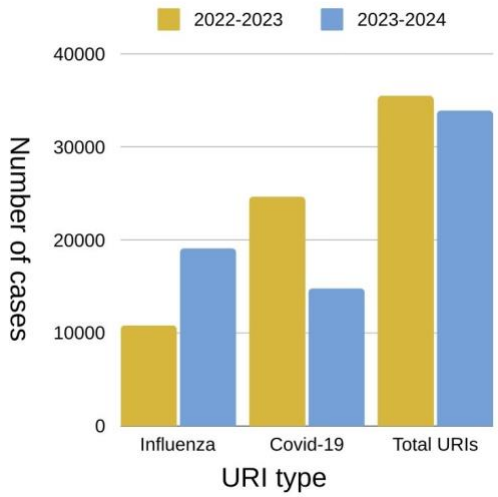
decrease acute care utilization by asthma exacerbation patients. Unfortunately, during the study timeframe, no patients meeting inclusion criteria presented with symptoms of asthma exacerbation.

The cause for this lack of presenting asthma exacerbation patients is unclear. The CDC explains that common triggers for asthma attack or exacerbation include dust, air pollution, pollen, pets, mold, exercise, climate, and upper respiratory infections (2022). Trackable triggers such as upper respiratory illness rates in this region were evaluated to determine if there was a notable difference between the 2022-2023 season and the 2023-2024 season. Influenza affected 19,113 patients in Montana in 2024 while the 2023 season showed influenza affecting only 10,829 individuals (Montana Department of Health and Human Services [MDPHHS], 2024; MDPHHS, 2023). However, Covid-19 had more cases in 2023 with 24,688 cases compared to 14,811 cases in the 2024 respiratory illness season so far (MDPHHS, 2024). More simply, there were 35,497 respiratory illness cases in the 2022-2023 season compared to 33,924 total respiratory illnesses in the 2023-2024 season (see Figure 1). There was not a significant difference in upper respiratory illness between the 2022-2023 season and the 2023-2024. While the 2022-2023 had slightly more URI incidence, it is unlikely that this resulted in the volume of asthma exacerbation patients seen by this site.

Other trackable asthma exacerbation triggers are air temperature and air quality. Weather across the two seasons was relatively stable with the average temperature of the 2022-2023 season of 27.7F and the 2023-2024 season of 31.55F (U. S. Department of Commerce [US DOC], 2024). Similarly, the average air quality in the region was 32 PM (particulate matter) in

both the 2022-2023 season and the 2023-2024 season (U.S. Environmental Protection Agency [US EPA], 2024).

Figure 1. Comparison of URIs between 22-23 season and 23-24 season.



Comparing common trackable triggers such as incidence of upper respiratory illness, weather, and air quality fails to identify an obvious cause for the absence of asthma exacerbation seen at this clinical site. Unfortunately, the lack of presenting asthma exacerbation patients during this respiratory illness season is difficult to tie to any specific cause.

While there was an absence of quantitative data collected for this study, its implementation is still likely valuable for the future treatment of asthma patients at this site. Themes that arose during discussion with the site provider was that there is likely disease-specific management education that should be conducted with site providers to provide better understanding of society recommendations in managing asthma and asthma exacerbation (S. Shepro, personal communication, February 7, 2024). The site providers at this location also provide primary care at off-site location. In his role as a primary care provider, this provider (PA-

C) noted that while he sees many asthma patients, he is not always comfortable initiating new medications for the condition and typically defaults to what has worked for the patient in the past or utilizes resources such as UpToDate or Epocrates to direct his care plan (S. Shepro, personal communication, February 7, 2024). While these resources are excellent at providing easy-access information, GINA regularly publishes a report on the diagnosis, treatment, and management of asthma that is directed by research and society recommendations. This provider has seen this report in the past but notes that his patient load is far too heavy to reference this with every asthma patient (S. Shepro, personal communication, March 6, 2024). One recommendation for this site is to provide further education and training to providers on asthma diagnosis, treatment, and management so that their providers may better care for patients presenting with this chronic problem.

The urgent care setting serves as a valuable touch point between asthma patients and care providers. While it is not feasible to develop an AAP in the urgent care setting due to time and resource constraints, providing an outline was shown by Skene et al. (2023) and Villa-Roel et al. (2018) to encourage collaboration between the PCP and the asthma patient. This site is encouraged to continue to utilize this intervention as it is a low-cost, likely time-efficient, and guideline and evidence guided intervention.

Conclusion

The reviewed literature indicated that the implementation of discharge educational material has the potential to improve asthma outcomes (Skein et al., 2023). However, a 2018 study by Villla Roel et al. (2018) highlights the need for more data to determine whether AAPs decrease relapse utilization of acute care settings by asthma exacerbation patients. This study,

while failing to collect quantitative data, illustrated the need for further education on asthma treatment in both the urgent care and in the primary care setting at this care system. Additionally, this study further emphasizes the gap between what guidelines suggest for management of asthma and what actually happens in practice as also noted by many of the studies found on this topic and used for the literature review (Akinbami et al., 2019; GINA, 2022; Makhinova et al, 2021; Prigge et al., 2022; Skene et al., 2023; & Villa-Roel et al., 2018). Alignment of guideline recommendations and practical management of asthma patients likely needs to be investigated further. More information is still needed regarding whether AAPs decrease repeat asthma exacerbation patient utilization of urgent care settings such as ED and walk-in clinics and ultimately improve asthma outcomes.

CHAPTER FOUR

ADVANCED NURSING ESSENTIALS REFLECTION

Introduction

The Montana State University (MSU) Doctor of Nursing Practice (DNP) Program provides a framework, coursework, and instruction established on the nursing essentials published by the American Association of Colleges of Nursing (AACN) in their publication, Core Competencies for Professional Nursing Education (2021). This publication of essentials not only guides undergraduate nursing, but also the education of advanced-level nurses. As a graduate of Montana State University's Bachelor of Science in Nursing and a student in the Doctor of Nursing Practice curriculum, this student feels that they have had a well-rounded education guided by the AACN's recommendations. This student has developed research, participated in hands-on clinical assignments, and engaged in didactic coursework that have provided the foundational knowledge for a career as an advanced practice nurse.

Domain 1: Knowledge for Nursing Practice

This foundational domain compares and justifies the nursing practice as a scientific discipline. Current nursing practice is guided by the career's history, evidence gleaned via scientific studies, and the sharing of interdisciplinary knowledge. Advanced level nurses are trained in translating the available evidence discovered by nursing science into applicable, every-day, practice (American Association of Colleges of Nursing [AACN], 2021). This domain explains an expectation being able to "demonstrate of understanding of where the nursing

discipline's distinct perspective" coexists with other discipline perspectives and be able to connect theory and research among nursing and a variety of sciences (AACN, 2021).

As this domain is the foundation of the AACN's essentials and directs MSU's nursing education, it is apparent in every aspect of the nursing education provided by MSU. In the DNP program, this student has utilized evidence-based practice and society guidelines to develop a quality improvement (QI) project to support and guide current practice. By conducting a literature review, contextualizing results of the literature review, and understanding the relevance of the literature review results in context of the practice setting allowed the development of a QI project to better synthesize and add to the knowledge of current nursing practice. This QI project added to an existing body of research data which will add to the advanced nursing provider's influence in healthcare.

The basic understanding of evidence-based practice was established in the first year of this DNP program with NRSG 604 and 605, Evidence Based Practice I and II, when evaluating study strength, understanding research methods and analysis, and better understanding of the reporting of outcomes was discussed. Statistical applications (NRSG 606) helped this student to better evaluate the relationship between research findings and their relevance to practice. This domain has clearly guided the coursework for a variety of DNP courses and lays the foundation for the QI project developed and implemented by this student.

Domain 3: Population Health

The AANC describes this domain as the "continuum from public health prevention to disease management" and includes collaborative efforts between "communities, public health, industry, academia, health care" and other entities to impact population health outcomes (AACN,

2021). While population health can be described as any "discrete group" that is cared for within a larger setting, this domain's goal is to improve health equity and overall health of the community. This domain includes a large contextual framework but is guided at promoting the training of competent nurses and advanced practice nurses in management of public health, advocacy strategies, and disaster/emergency public health preparedness (AACN, 2021).

The MSU DNP program reinforces this domain throughout the curriculum. However, NRSG 614: Vulnerability and HC in Diverse Communities and NRSG 612: Ethics, Law, and Policy demonstrate the explicit impacts of this domain on nursing practice. Through the evaluation of public health measures and goals, including Healthy People 2020, this student was able to better understand policy that dictates health measures for the broader population and assess how policy may impact health distribution. In clinical rotations done by this DNP student, the rural healthcare setting was experienced over approximately 270 hours of clinical rotation. The volume and health characteristics of a rural population are challenging to study as an outsider to said rural population as presentation of symptoms and patient report of symptoms differs from that of the more familiar, metropolitan, population known by this student. Interviewing, communication, and educational strategies employed by this student evolved as the population of interest became more familiar via conversations with relevant stakeholders and assessment of the rural system's capacity.

Domain 5: Quality and Safety

This domain was best studied in the final two semesters of the DNP program though the development of a quality improvement project. Domain 5 employs principles of health improvement though quality and safety. When caregivers, such as nurses and nurse practitioners,

are empowered to promote safety and quality, patients experience better outcomes (AACN, 2021). This domain explains that using data, national safety resources, transparent nursing cultures, and promoting safety advocacy promote quality health care (AACN, 2021). This DNP student examined some aspects of complexity of care topics in their quality improvement project, including themes regarding the implementation of new care processes, obtaining shareholder buy-in, and providing evidence-based care. A specific example is the lack of expected data complied during this student's project data collection and further analysis/discussion required to better understand the healthcare system affected during the project.

This domain encourages the usage of data-driven benchmarks to monitor performance of health care systems and populations. Throughout the entire DNP program, Healthy People 2020 and Healthy People 2030 have been referenced as guides in which to base care plan goals. Developed by the Centers for Disease Control (CDC), Healthy People collects data from a variety of primarily federal sources to create nationally representative goals for healthcare. Understanding these goals helps individual practitioners, clinics, healthcare systems, and the government monitor and modify goals to promote public health. The MSU DNP program utilizes these goals as general guidelines guiding potential projects and research for DNP students. The CDC collects specific population information pertaining to the Healthy People goals which allows for more comprehensive data collection regarding these goals and projects related to them.

QI Project Effect on Future Career

The process from acceptance into the DNP program to potential graduate of the DNP program has been an emotional and educational journey for this student. The quality

improvement project, specifically, has better informed future practice for this student. Prior to this doctoral program, this student had a poor understanding of what went into healthcare research, systems development, collecting of data, and dissemination of information. While the DNP program at MSU prepared this student academically and theoretically for this process, only personal experience could demonstrate the hard work, dedication, and heartbreak that occurs with project development, implementation, and analysis. Projects such as the QI project for MSU DNP students require a great amount of collaboration between disciplines, understanding of the studied population, idea and research topic development, implementation and observation of population and topic of study, and analysis of quantitative and qualitative information. This creates a huge amount of information that, while directly related to the topic of study, is not necessarily valuable contributing information. Weeding through this information takes a great amount of stamina to produce distilled, valuable information.

The skill of distilling a great amount of broad information into a small amount of concentrated information has extended beyond the realm of research for this DNP student. This student has been able to relay the skill of information distillation into patient care. Demonstrated by distilling vast patient complaints into concentrated, system related complains has allowed this student to better understand and filter out “unnecessary information”. This student uses quotes around “unnecessary information” because they understand that all information is important, though not all information is diagnostic. This skill set has taken at least 540 hours of clinical rotation and is still being perfected. However, through collecting evidence, interviewing patients, researching practice guidelines, and advising on treatment modalities, this DNP student has

transformed from “unknowing new DNP student” to “more-knowing, curious, resourceful, investigational, researching, DNP student”.

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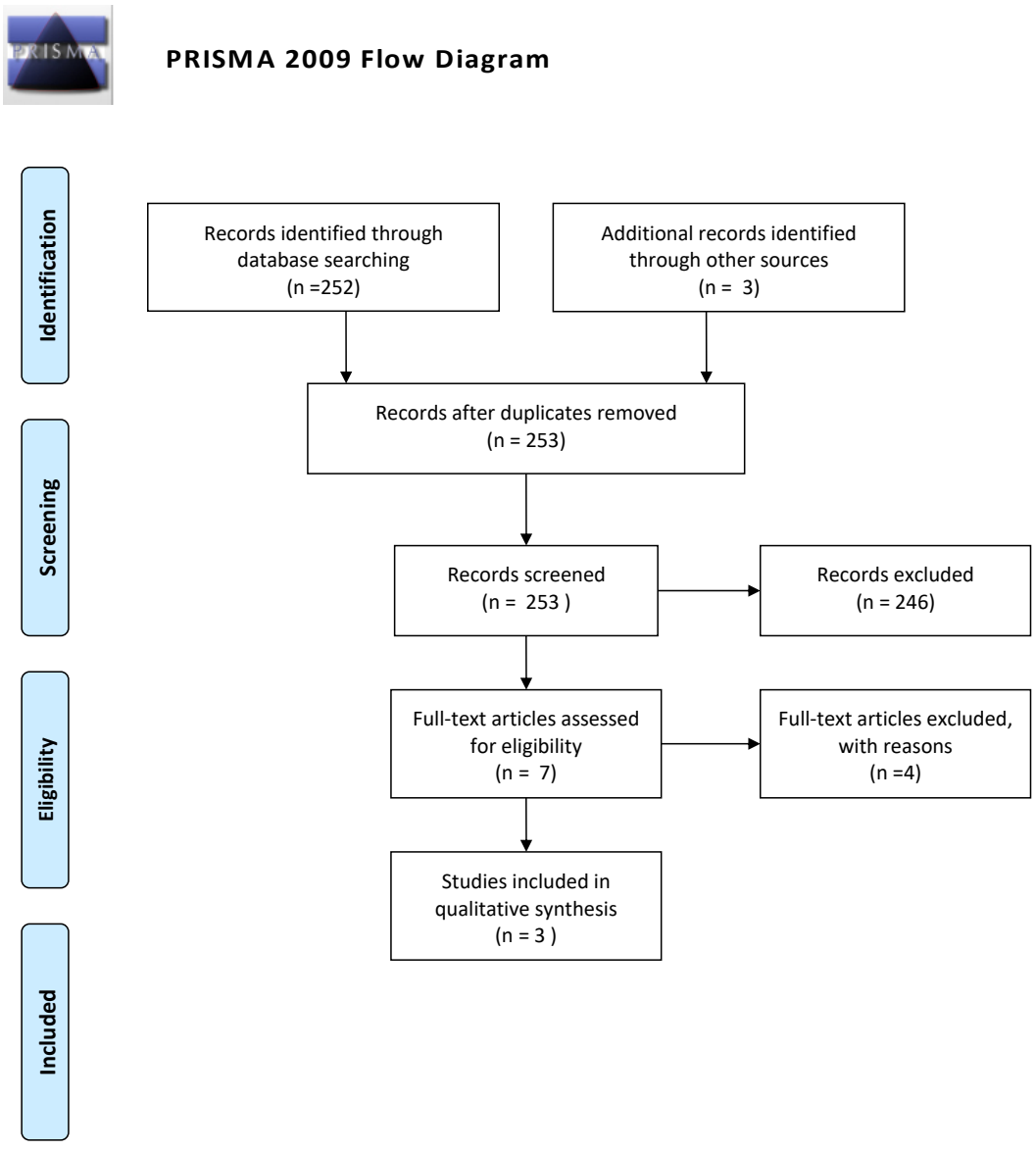
APPENDICES

APPENDIX A

PRISMA

Figure 2. PRISMA Flow Diagram



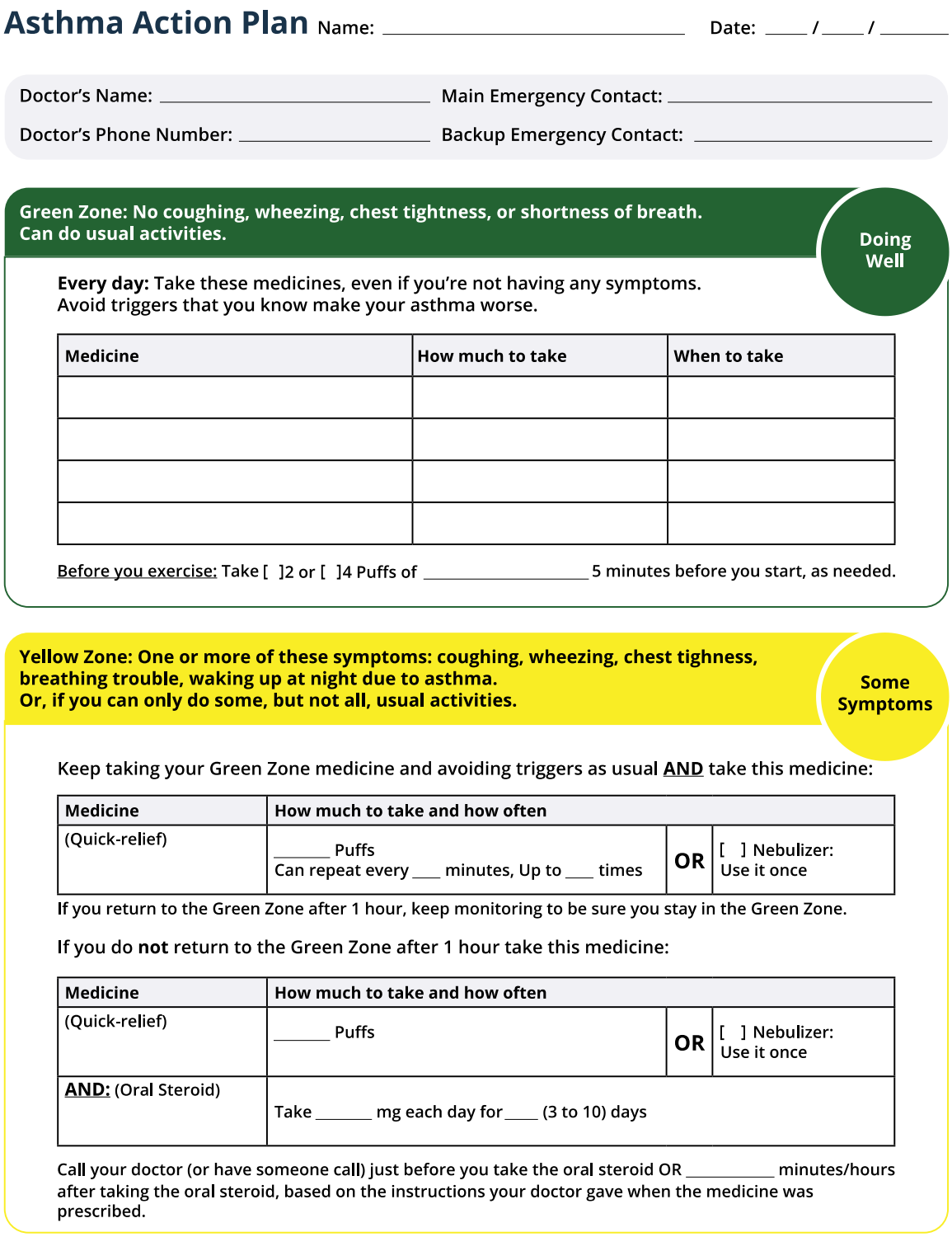
From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit www.prisma-statement.org.

APPENDIX B

CDC ASTHMA ACTION PLAN

Figure 3. CDC Asthma Action Plan



Asthma Action Plan

Name: _____ Date: ____ / ____ / _____

Doctor's Name: _____ Main Emergency Contact: _____

Doctor's Phone Number: _____ Backup Emergency Contact: _____

Green Zone: No coughing, wheezing, chest tightness, or shortness of breath. Can do usual activities.

Doing Well

Every day: Take these medicines, even if you're not having any symptoms. Avoid triggers that you know make your asthma worse.

Medicine	How much to take	When to take

Before you exercise: Take [ ]2 or [ ]4 Puffs of _____ 5 minutes before you start, as needed.

Yellow Zone: One or more of these symptoms: coughing, wheezing, chest tighness, breathing trouble, waking up at night due to asthma. Or, if you can only do some, but not all, usual activities.

Some Symptoms

Keep taking your Green Zone medicine and avoiding triggers as usual **AND** take this medicine:

Medicine	How much to take and how often		
(Quick-relief)	_____ Puffs Can repeat every ___ minutes, Up to ___ times	**OR**	[ ] Nebulizer: Use it once

If you return to the Green Zone after 1 hour, keep monitoring to be sure you stay in the Green Zone.

If you do **not** return to the Green Zone after 1 hour take this medicine:

Medicine	How much to take and how often		
(Quick-relief)	_____ Puffs	**OR**	[ ] Nebulizer: Use it once
AND: (Oral Steroid)	Take _____ mg each day for ____ (3 to 10) days		

Call your doctor (or have someone call) just before you take the oral steroid OR _____ minutes/hours after taking the oral steroid, based on the instructions your doctor gave when the medicine was prescribed.

Asthma Action Plan

Name: _____ Date: ____ / ____ / _____

Doctor's Name: _____ Main Emergency Contact: _____

Doctor's Phone Number: _____ Backup Emergency Contact: _____

Red Zone: EMERGENCY! Very short of breath, or quick-relief medicines have not helped, or symptoms are the same or worse after 24 hours in the Yellow Zone. Or, if you cannot do any of your usual activities.

Severe Symptoms Emergency

Take this medicine	How much to take		
(Quick-relief)	_____ Puffs Can repeat every ___ minutes, up to ___ times	**OR**	[ ] Nebulizer: Can repeat every ___minutes, up to ___times
(Oral steroid)	Take_____ mg.		

After you take your medicine, call your doctor right away!
If you're still in the Red Zone after 15 minutes and have not reached your doctor, go to the hospital or call 911!

If you have these DANGER SIGNS: trouble walking or talking due to shortness of breath or your lips or fingernails are blue, pale, or gray, take ____ puffs of your quick-relief medicine and GO to the hospital or call 911 NOW!

These DANGER SIGNS mean you need help right away. Don't wait to hear back from your doctor.
GO to the hospital or call 911 NOW!

If you use a peak flow meter you can use these scores to determine your current zone:

Your best score	Your green zone	Your yellow zone	Your red zone
_____	_____ or higher (80% of best score)	_____ to _____ (50 to 80% of best score)	_____ or lower (50% of best score)

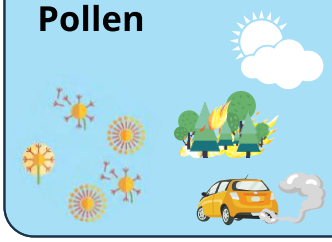
Know Your Asthma Triggers.

Learn how to avoid triggers to control your asthma.

Triggers are things that make your asthma symptoms worse. People with asthma do not all have the same triggers. Avoiding your triggers is one step you can take to help keep your asthma under control. Work with your healthcare provider to check whether any of these things make your asthma worse, then take the related steps below. Check CDC's webpage for other steps you can take: www.cdc.gov/asthma

Outdoor Triggers

Weather
Air Quality
Pollen



- Pay attention to radio, television, the internet, or newspaper reports about things that might trigger your asthma. These might include reports about weather, air quality, pollen count, or wildfire conditions.
- Plan outdoor activities for when the air quality is best.
- If pollen triggers your asthma, close windows and turn on air conditioning (if possible) when pollen levels are high.
- When there are wildfires, stay away from areas where there is smoke or vapors. Stay indoors, if possible, to avoid smoke or vapors.
- When it is cold, wear a scarf or face mask that covers your nose and mouth to keep airflow as warm as possible.

Indoor Triggers

If you are allergic to dust mites, cockroaches, rodents, indoor mold, or pets, use an air purifier with a high-energy particulate air (HEPA) filter, and use HEPA filters for vacuum cleaners. Keep your home as clean as possible. If you can, ask someone else to clean your home regularly, or wear a dust mask while you clean.

Pets

If you are allergic to your pet, the best way to avoid exposure is to remove the pet from your home and have the house cleaned. If you can't remove the pet:

- Keep the pet out of your bedroom.
- Ask a family member to wash your pet regularly.
- Use allergen-proof pillow and mattress covers.
- Use an air cleaner with HEPA filter.

Note: Pet fur, skin, and saliva trigger some people's asthma.

Dust mites

(tiny bugs that live in dust and fabric)

- Keep relative humidity levels in your home low, around 30%–50%.
- Wash your bedding every week and dry completely.
- Use allergen-proof pillow and mattress covers.

Know Your Asthma Triggers.

Indoor Triggers

Cockroaches **Mice** **Rats** 	• Keep your kitchen clean and store food and garbage in closed containers. • Don't leave out any standing water or other liquids. • Seal cracks or openings in cabinets, walls, floorboards, and around plumbing. • Use traps or poison bait to get rid of roaches, mice, or rats. Keep bait away and out of reach of children and pets. Avoid sprays and foggers.
Mold **Humidity** 	• Fix water leaks as soon as possible and dry damp or wet items within 48 hours. • Remove all moldy items from your home. • Use an air conditioner or dehumidifier to keep the air dry in your home. Keep relative humidity levels in your home low, around 30%–50%. • Empty and clean refrigerator and air conditioner drip pans regularly. • Use bathroom exhaust fans or open windows when you shower.
Smoke **Sprays** **Scents** **Disinfectants** 	• Avoid places where people smoke. If you smoke, ask your healthcare provider how to quit. • Don't use a wood-burning stove, kerosene heater, or fireplace. • Avoid perfume, paint, hairspray, and talcum powder. • Try to stay away when cleaners or disinfectants are being used and right after their use. • Increase air flow by opening doors and windows and turning on exhaust fans.

Other Common Triggers

Illness 	• Contact your healthcare provider if you think you have another health problem that is making it harder for you to breathe. Such problems might include the flu, a cold, acid reflux (heartburn), a sinus infection, severe allergies, or another health concern.
Emotions 	• Talk to your healthcare provider if anxiety, stress, or other emotions make your asthma worse.

Notes:

APPENDIX C

SMART GOALS

<table>
<tr><td colspan="3">SMART Goal #1 (Long-Term): There will be a 100% reduction of asthma exacerbation relapse urgent care visits between February 2024 and April 2024 when compared to February 2023 and April 2023</td></tr>
<tr><td colspan="3">• All patients presenting with asthma exacerbation symptoms will be provided the “asthma packet” on discharge
o Site rep and this DNP student will be responsible for identification of target population and provision of educational materials
o IT technologist will assist in running reports to determine rates of relapse</td></tr>
<tr><td>Data to be collected</td><td>Method of collection and Responsible Party</td><td>Planned Data Analysis</td></tr>
<tr><td>• # of patients presenting with asthma exacerbation between Feb 2023 and April 2023, and between Feb 2024 and April 2024
• # of patients who were seen for exacerbation >1 time between Feb 2023 and April 2023 and between Feb 2024 and April 2024</td><td>• IT technologist will assist in running reports examining symptoms of exacerbation in HER records
• This DNP student will track # of patients in spreadsheet</td><td>• Comparative statistical analysis to compare 2022-2023 data to 2023-2024 data.</td></tr>
</table>

Table 1. SMART Goal #1

<table>
<tr><td colspan="3">SMART Goal #2 (Mid-term): 100% of patients presenting to this site with asthma exacerbation between February 2024 and April 2024 will be provided with asthma discharge packet</td></tr>
<tr><td colspan="3">• All adult patients presenting to this site with symptoms of asthma exacerbation and an asthma diagnosis will be provided an asthma discharge packet. Provider will include trackable dot phrase in his discharge summary once information is provided.
o Packet to include an asthma action plan outline and education about asthma management (Appendix C) as well as a list of primary care provider contact information for the area.</td></tr>
<tr><td>Data to be collected</td><td>Methods of Collection and who is responsible</td><td>Planned Data Analysis</td></tr>
<tr><td>• Number of asthma exacerbation patients seen
• Number of dot phrases used to</td><td>• Data will be pulled from electronic health record by an IT staff member and provided to this student.</td><td>• Number of pts seen will be compared to number of dot phrases used
• Data will be reviewed with the provider</td></tr>
</table>

confirm information dissemination	• This student will collect this data in a spreadsheet for evaluation and further discussion	

Table 2. SMART Goal #2