Developing an Evidence-Based Protocol for Managing Outpatient Pediatric Asthma.

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Introduction

Asthma is a common chronic disease affecting children in America. It affects 9 million or 12.5 percent of children under 18 years of age (FastStats-Asthma, n.d). Every year about 4 million children suffer an asthma exacerbation which results in about 2 million emergency department visit and approximately 14 million missed school days (Quickstats-United States 2003, 2005). It is the third leading cause of hospitalizations among pediatric patients below 18 years of age (Eder, Ege, & Von Mutius, 2006).

Even though National Heart Lung and Blood Institute (NHLBI) guidelines for asthma management recommendations have existed for over a decade, several studies have suggested a gap between actual asthma management and recommendations of NHLBI guidelines (Lee, & Le, 2013). Improvement in patient's symptom control, quality of life and a reduction in adverse event risks will not be achieved, unless clinicians adhere to evidence-based asthma guidelines and protocols (Gustafsson, Watson, Davis, & Rabe, 2006).

According to Field and Lohr (1990) clinical practice guidelines (CPG) are "systematically developed statements to assist practitioners and patient decisions about appropriate healthcare for specific clinical circumstances". Despite promoting positive patient health care outcomes, uniformity of care among clinicians and improved quality of health care, with implementation of CPG, guidelines and protocols are not uniformly adopted among healthcare providers (Burgers, Smolders, Weijden, Davis, & Grol, 2013).

The DNP nurse is prepared to lead inter-professional teams during analysis of practice and organizational issues (American Association of Colleges of Nursing, 2006). This DNP project will incorporate evidence-based practice, and inter-professional collaboration to develop an asthma protocol to be used by healthcare providers in an outpatient pediatric setting. The

protocol will focus on the management of asthma in children. Asthma managed effectively based on national guidelines will help improve patient symptoms control, quality of health and possible adverse events.

Background

At an outpatient pediatric clinic in the southwestern part of the United States, clinicians (physicians, nurse practitioners, respiratory therapist and medical assistants) manage the patients with asthma daily. Pediatric patients are most often treated at a general pediatric clinic and then referred to a pediatric lung specialist. The development of an asthma protocol in a pediatric outpatient clinic would expedite the immediate management of asthma in children at the clinic.

Asthma can be perceived as a severe chronic health and economic medical condition, of concern in the United States. The financial burden of asthma to the United States is approximately $56 billion each year. The Center for Disease Control and Prevention (CDC) notes asthma affected 18.7 million adults and 7 million children, in 2010 (CDC, 2016).

Significance

Several studies have shown that poorly controlled asthma has a negative impact on patient's health. Poorly controlled asthma is a huge drain on the health care system and clinician, it is synonymous with increased emergency department visits, hospitalizations, unplanned physician visits, missed school days and workdays, and loss of productive days (O'Byrne, et al., 2013).

Studies have also shown that health care providers who follow evidence-based treatment recommendations and provide guideline-driven clinical care for medical conditions have evidenced positive patient outcomes for routine clinical care and specifically for asthma treatment (Dexheimer, Borycki, Chiu, Johnson, & Aronsky, 2014).

Several international asthma guidelines support clinicians to provide evidence-based asthma care, the guideline from the US National Heart Lung and Blood Institute (NHLBI) is incorporated in the current study (Camargo Jr., Rachelefsky, & Schatz, 2009).

Problem Statement

Although a number of clinicians at some pediatric outpatient clinics are familiar with the evidence-based guidelines, there are not always written protocols in place to direct the care of patients with asthma. The development and implementation of a guideline-driven protocol may help improve some areas of clinical management, such as patient assessments, treatment plans and education of the patients and their families (Self, Usery, Howard-Thompson, & Sands, 2007). An electronic chart review at an outpatient clinic in the southwestern area of the United States demonstrated asthma diagnosis and management varied among the clinicians. These findings were consistent with the concern that an evidence-based guideline-driven protocol would assist in caring for pediatric patients with a diagnosis of asthma.

Purpose Statement

The purpose of the project is the development and implementation of an evidence based pediatric asthma protocol to assist in the care of patients in a pediatric outpatient clinic. Improvement indicated by compliance of NAEPP EPR3 guidelines is demonstrated by the literature and can be measured using chart reviews of patient electronic medical records (EMR). The protocol employed as a quality improvement tool may improve the treatment outcomes for the pediatric patient with asthma. The DNP nurse is prepared to lead inter-professional teams during analysis of practice and organizational issues (American Association of Colleges of Nursing, 2006).

This DNP project will be supported by evidence-based literature, and inter-professional collaboration to develop a protocol to be used in an outpatient pediatric setting. The aim is to more effectively manage pediatric asthma by using the evidence-based literature to develop a protocol.

Objectives

Objectives of the project will be.

1. Develop a pediatric asthma protocol to be used by clinicians in an outpatient pediatric clinic setting.
2. Present the developed pediatric asthma protocol to clinicians and evaluate their understanding of the protocol.
3 Implement the pediatric asthma protocol into the routine care of pediatric asthma patients at the outpatient pediatric clinic setting.
4. Evaluate the impact on patient care using the pediatric asthma protocol through patient chart review of EMRs.

Literature Review

The literature review includes general information about asthma, specific issues about pediatric asthma presentation, the inclusion and exclusion criteria reviewed in selected articles studies that looked at implications of asthma management guidelines, highlights of national guidelines, clinical practice guidelines, specific to asthma diagnosis and treatment, barriers to asthma management measures for periodic assessment and patient education.

Impact of the Problem

Asthma is a common chronic pathological condition throughout the world, and it has been the limelight of public health interventions during recent years. An estimated 300 million people in the world currently have asthma (Masoli, Fabian, Holt, & Beasley, 2004).

Asthma prevalence, morbidity, and mortality pattern are noted to increase in all age groups, and notably in the pediatric population. The prevalence of childhood asthma in the United States increased from 9% to 10% in 2011. This increased prevalence is attributed to an increased expense by state Medicaid programs (Pearson, Goates, Harrykissoon, & Miller,2014). Asthma is known to the affect social lives of patients (Weinberg, 2009), and it is the leading reason for school absences (Weinberg, 2009) and parents work absenteeism (Weinberg, 2009). Suboptimal long-term treatment and delay in seeking immediate medical attention during an acute asthma exacerbation are some of the preventable causes of death in asthmatics. With evidence-based asthma management, most asthma patients are able to lead normal or near normal lives.

Inclusion and Exclusion Criteria

ProQuest Central database search of the term asthma and management yielded 206983 articles. Inclusion criteria for this project were full text, peer reviewed articles in scholarly journals dated 2010 to the present. Studies considered for this review included either documents, reports, case studies or evidence-based asthma related articles that involved humans, children and adolescent as subjects were included. Studies excluded from this review included studied conducted outside of the United States and studies not published in English because of lack of generalizability. Other exclusion criteria included blogs, newspaper and magazine articles,

studies reported as citation, abstract or indexing only or editorials. Studies that did not look at asthma were excluded.

Addressing the Problem with Current Evidence

The project site will be a pediatric clinic located in the southwestern part of the United States. Asthma starts in infancy and childhood and pose problems within the population of young children and in adolescents (Bousquet, Clark, Hurd, Khaltaev, Lenfant, O'Byrne, & Sheffer, 2007). A number of pediatricians may feel that guidelines for asthma do not address several pediatric issues and hence have proposed that the guidelines are more specific for children (Bousquet et al., 2007). According to Bousquet, Clark, Hurd, Khaltaev, Lenfant, O'Byrne, & Sheffer (2007) asthma guidelines are not perfect; they are the best evidence-based clinical tools available to providers and patients, to receive the best possible asthma care.

Current Recommendations and Benefits:

The NAEPP released its last updated EPR 3 in 2007, which is based on current scientific evidence. NAEPP EPR 3 recommends the national asthma guidelines the pediatric clinic can adapt to diagnose and manage asthma (NHLBI, 2010). ACHA (2009) recommends following federal guidelines in caring for pediatric patients with asthma. NAEPP EPR 3 emphasizes accurate measurement of asthma severity and initiate evidence-based management by “stepping up” treatment for uncontrolled asthma, and “stepping down” treatment for well-controlled symptoms. NAEPP EPR 3 recommends ICS for initial persistent asthma treatment. Most asthma patients need controller medication like ICS and added SABA, and they should be instructed on the appropriate use of each medication (NHLBI, 2010).

The practice climate affects adherence to national asthma guidelines. One study reported providers perceived asthma guidelines as useful, many providers mentioned a lack of clinical

tools to provide appropriate care (Tumiel-Berhalter & Watkins, 2006). A systematic implementation of the NAEPP EPR 3 practice guideline improved providers' prescribing of controller medications due to the proper assessment of the severity of the illness in uncontrolled patients (Carlton, et al., 2005).

Theoretical Framework

Protocol Development and Quality improvement (QI) involves using a recognized and methodical approach to continuous improvement. In a pediatric setting, the ultimate focus is on improving patient care, which aligns with the American Academy of Pediatrics' mission of promoting the health and well-being of infants, children, adolescents, and young adults (HealthyChildren.org, 2017).

Protocol development is a patient-centered process within an organization supported by the organizational strategic plan. Its purpose is to provide quality health care that meets or exceeds expectations for executing a continuous flow of improvements. Since the Institute of Medicine (IOM) initiative to reduce medical error (IOM, 2001), several institutions have invested resources in reducing medical errors and thereby increasing the quality of care and patient safety (McLaughlin & Kaluzny, 2006). Protocol development and continuous quality improvement (CQI) do not happen quickly; they evolve gradually. Protocol development provides several benefits for health care management. It can help motivate staff to improve performance because there are objective metrics that can be measured to compare one term from another.

Deming's PDSA cycle is a dynamic four-step management method that has been extensively in healthcare and non–healthcare settings to implement process changes quickly and efficiently. This Model provides a systematic approach to planning, testing, evaluating, and

applying changes in processes and systems of care. It may be used to guide the framework and model for this DNP project. It has been used for CQI in many businesses and service areas. It is sometimes known as the Deming cycle, or the plan-do-study-act (PDSA) cycle. The Model involves a four-step cycle for problem-solving and includes: (1) Plan—a change or a test, aimed at improvement (2) Do—carry out the change or the test (preferably on a small scale); (3) Study--evaluate the result; and (4) Act—Adopt the change, or abandon it, or run through the cycle again (Deming, 1993). PDSA is a continuous process for learning and improvement based on the belief that knowledge and skills are limited, but, by repeatedly implementing the cycle of improvement, each cycle brings the organization closer to the goal of perfection (Moen & Norman, 2010). Study of the weak areas evidenced by comparing the current clinical practice to NHLBI asthma guideline is part of the Planning cycle and indicated by limited documentation of asthma treatment and inconsistent treatment. The Do cycle includes staff training, checklists, and providing templates for patient education. The Study cycle may be accomplished during the annual EMR review with the grading of the QI parameters. The Act cycle would involve the application of the protocol to the clinic of successful processes introduced in the Do cycle (Deming, 1993).

The Asthma protocol development and CQI is a collaborative process with many stakeholders from a variety of disciplines, but the focus is on the needs of the patient. Nursing staff encounter patients at the beginning, in the middle of the treatment process, and at the patient discharge stage. The nursing function is not limited to taking vital signs but includes measurement of peak flow meter reading (PFM), obtaining an asthma control test (ACT) score and recording current medication history, allergy history. Nursing staff should be trained to perform accurate spirometry testing and patient education. The history section includes

documentation of the symptoms a patient experiences, comorbidity and triggers, home monitoring, assessment of short acting beta agonist (SABA) frequency of use, past PFT and past medical history related to asthma exacerbation. The exam section includes upper and lower airway exam, peak flow reading/SaO2 and documentation of post SABA treatment response.

Because of their high level of patient contact, the professional nurse is a key player in CQI. The assessment section includes appropriate parameters for documentation of asthma type and level of severity. The last plan section includes documentation of an asthma action plan, patient education, referral when necessary, appropriate follow up visit intervals, comorbid management, environmental control, step up and down treatment plan and monitoring spirometry as part of PFT.

Description of the Project Design

The DNP project will include the development of an asthma protocol to be used by clinicians in an outpatient clinic setting. It will be based on “Model for Improvement”. The model comprises two equally important parts. Part 1 covers three fundamental questions that are essential for guiding work improvement: (a) what objectives does the project desire to accomplish? (b) How will the study evaluate the change? (c) what changes can the project recommendations make that will result in improvement?

Part 2 of the model involves the Deming's Plan-Do-Study-Act (PDSA) cycle (Deming, 1993) that tests and implements change in real-work settings. During the planning stage, the project leader and office manager will be conducting a retrospective EMR chart review and will create a sample list of patients between the ages of 5 and 8 years, both ages inclusive, with a diagnosis of reactive airway disease, nonspecific asthma, and asthma diagnosis. The randomly selected patients will be scheduled appointments to implement the plan. Next, the providers are

responsible for the do stage of the project, and this is achieved by implementing the asthma management guided by the asthma protocol. During the project, the results of the protocol implementation will be reviewed by doing a post implementation EMR chart review and learning from the analysis if the project parameters are met or not. The parameters will include improved asthma severity assessment using the validated ACT tool, improved asthma controller medication use, improved medication adherence by patients, correct techniques for inhaler use and improved asthma patient education. The final component of the model is the Act. Here the findings of the project will be adopted.

Population of Interest and Stakeholders

The population of interest will be the clinical providers and clinical staff who are involved in administering the ACT and managing the pediatric asthma patients that come through the clinic. The clinical providers include three pediatricians, seven nurse practitioners, and the clinical staff include fifteen certified medical assistants.

The key stakeholders include from the pediatric practice the medical director and CEO, office manager, and the pediatric pulmonologist. The pediatric pulmonologist will be the content expert that will be consulted on the ongoing designing and implementation of the pediatric asthma protocol. The medical director is the project facilitator, supporter and in collaboration with the project leader will evaluate the asthma CQI. The office manager will coordinate the team members throughout the asthma project and will facilitate the clinic staff efforts. Collaboration among all stakeholders is important in the design of a program to meet the educational needs of staff and patients. Bender, Connelly and Brown (2013) defined the interdisciplinary collaboration as an inter- personal process characterized by healthcare

professionals from multiple disciplines, with shared objectives, responsibilities, decision-making, and working together to solve patient care problems.

Setting

The DNP project setting is a pediatric clinic in the Southwestern part of the United States (U.S). There were about 12,500 pediatric clinic patient visits during the 2016-2017 calendar year. Patients from birth to 18 years of age, representing diverse cultural and ethnic backgrounds, utilize this clinic for health wellness, primary care and sickness visits. The clinic has 12 patient exam rooms, two triage cubicles, front office manned by four receptionists, billing department, storage room for patient supplies and formula samples, an in-house lab, referral department and asthma education center. The patients are seen on scheduled appointment and same-day walk-in basis. About 65 % of the patient seen at the clinic use Medicaid to pay for the clinic services, while the remaining patient are a mixture of commercial insurance and cash patients. The project will include electronic medical record (EMR) data from the pediatric patient visits and the variables that will be examined are diagnosis of cough variant asthma, asthma, other asthma, reactive airway disease (RAD).

Recruitment

The clinic's mission is to provide individualized treatment and support preventive health, while striving to foster healthy lifestyles, improve the lives of children with chronic condition and control infectious diseases by creating awareness and timely prevention. In pursuit of providing quality care, the clinic providers and clinic staff continuously participate in various continuing education activities, and annual QI projects. Therefore, participation in the project will be mandatory for the providers and clinic staff.

The DNP asthma QI project will serve as a CQI project for the clinic and add to the clinic's efforts to provide evidence-based health care delivery to the clinic's patients. This project and asthma protocol will be announced to the providers and clinic staff as clinic fliers (Appendix 2 and Appendix 5) posted in the staff breakroom bulletin board, lab bulletin board, patient triage areas bulletin board, provider offices bulletin board, office manager's office. The clinic staff and providers meetings will be conducted prior to implementing the project. Before implementing the protocol, a retrospective EMR chart review of 50 charts will be utilized to select the project sample, based on key parameters such as the age of the patient, diagnosis of cough variant asthma, asthma, other asthma, RAD (reactive airway disease).

The retrospective EMR chart reviews will be done by evaluating sample records for presence, absence, or not applicable (NA) status of parameters for asthma management.

The parameters will be divided into five categories based on the NAEPP EPR 3 recommendations (NHLBI, 2010). The categories are organized to correspond with the EMR documentation sequence of subjective and objective data, assessment and evaluation, which includes patient education and discharge instructions. The first and second categories are to obtain a thorough asthma related history such as patient symptoms, patient's age, known triggers, current medication list, and resultant frequency of short acting beta agonist medication (SABA) use and emergency room or hospitalization history (Appendix 4). The provider will record the ACT score. The third category is the physical exam that includes upper and lower airway. The fourth category is documentation of asthma diagnosis and asthma severity level (Appendix 4). The last category will focus on patient education documentation, and SABA and controller medication prescribed. For this DNP project, patient education will include incidental asthma

teaching, by providing CDC fact sheet on asthma fast facts for kids and CDC's how to use your asthma inhaler and appropriate follow up intervals.

The parameters reflect the basic national guideline recommendations. It does not cover all the recommendations from NAEPP EPR 3. For example, parameters for spirometry, measure peak flow readings, written asthma action plan, treated comorbid conditions, specialty referral are not included

Tools/Instrumentation

The tools that will be used in the project include the asthma control test (ACT), and patient education factsheets.

Asthma Control Test

NAEPP EPR 3 recommends the use of this tool to improve the accuracy of patients and the family perception of asthma control. The C-ACT is a simple self-evaluated symptom assessment tool that can assist patients and providers to evaluate the state of both the impairment and the risk domain (Appendix 1). The possible total score ranges from 5 to 25, and a score of ≤ 19 indicates suboptimal control. ACT identifies an area of quality of life, the frequency of symptom, severity, the frequency of SABA use and self-perceived asthma control. The ACT questionnaire is a valid, easy to use tool that provides evidence to support clinical decision-making (Halbert, Tinkelman, Globe, & Shao-Lee Lin, 2009). ACT is not a comprehensive test, and it complements other assessments obtained during the visit and the clinic staff are familiar with this test and may find it easy to score. Glaxo-Smith Kline, the company that holds the license to the ACT form will be contacted for permission to use the C-ACT (Appendix 6) for the project and clinic patients. The Asthma Control Test (ACT) is a valid and reliable patient-based 5-item assessment tool to assess asthma control (Melosini et al., 2012). The Childhood Asthma

Control Test (C-ACT) is a 7- item patient-based assessment tool used to determine asthma control in children aged 4 -11 (Deschildre et al., 2014). Examples of both the C-ACT can be found in Appendix 1.

The C-ACT is a 27-validated tool for assessing and identifying children with inadequately controlled asthma (Liu et al., 2007). The C-ACT can be a valuable tool for providers based on its validation, ease of use, input from the children and their parent/guardian, and its alignment with asthma guidelines (Liu et al., 2007).

Patient Education

Asthma education improves patient compliance with medication (Delaronde, Peruccio, & Bauer, 2005) and improves the morbidity pattern (Mishra, Rao, & Padhi, 2005). Asthma self-management education is important to the control of asthma. Education directed toward asthma self-management emphasizes patient participation in symptom monitoring and control. Regarding patient education, the 2007 NHLBI guidelines recommended asthma education should be provided at every patient encounter by all providers and all points of care (Jones, 2008).

Several studies have investigated asthma education programs. A study of young adults in Finland indicated the degree of patient asthma education could be affected by childhood living conditions and economic adversities (Kestila et al., 2005). The study concluded that recognizing childhood experiences could play an essential role in preventing health problems in adulthood.

Teaching by providers during the visit will include the web-based CDC factsheet and the CDC how to use your inhaler fact sheet. This education will provide patients with knowledge regarding management of asthma and to cope with the disease daily.

Patient education is an integral part of a clinic visit. Two CDC web-based patient fact sheets namely, (a) asthma fast facts for kids and (b) know how to use your asthma inhaler in

English and Spanish will be reviewed by the provider during the clinic visit (Appendix 3A and Appendix B). They will be handed out by the provider to asthma patient as part of the teaching during the patient visit. These patient education resources are selected as they were easily accessible on the internet, regularly updated, available in bi-lingual formats and they are in the public domain. CDC materials available on the web site are in the public domain and are free of copyright restrictions unless otherwise noted (CDC Media Relations, 2017). During each clinic visit, asthma patient education will be documented in the EMR by the clinical providers once the incidental teaching and patient handout is given to the patient.

Data Collection Procedure

Data collection for this project will include retrospective and post protocol implementation EMR chart reviews, ACT administering, scoring and patient teaching patient education using the CDC asthma sheets. The project will use descriptive statistics which include percentiles, frequencies, and correlations. Before implementing the protocol, retrospective EMR parameters will be evaluated to identify cases based on criteria in the QI flow sheet. Once the EMR parameters are estimated, each parameter may be calculated as a percentage of positive findings by using the RStudio, a free and open-source integrated development environment for R, a programming language for statistical computing and graphics (RStudio, 2018) for frequency distribution and percentile ranks.

The project design will be a pre-and post-comparison of outcome measures. Demographic data will be analyzed using descriptive statistics (mean, SD, frequencies and percent). Secondary data will be measured as continuous data (ACT score), using a paired t-test. Categorical data will be analyzed using nonparametric techniques to describe the EMR chart review based on diagnoses, severity of asthma, control of asthma, and asthma education. The

first level of evaluation will be the analyses of the retrospective EMR chart review. The final analysis will be a comparison of the pre-and post-test data obtained using a paired –t-test and Mann Whitney U test using Minitab statistical software.

Intervention/Project Timeline

Steps for the implementation of this project have already been defined in the design of the DNP project. Table 1 contains the timeline for the implementation and evaluation of this project.

Table 1

Timeline for Project Implementation

Phase	Milestones	Timeframe
1	Pre-implementation EMR Chart review	1-2 weeks
2	Announcement of the DNP project, Asthma Protocol to staff	1 week
3	In-service to providers and clinical staff. Begin using the Asthma Protocol	2-3 weeks
4	Post-implementation EMR chart review	1-2 weeks

At the beginning of the project, 50 EMRs will be randomly selected from eligible records for the data review, this will be the pre-protocol review. The project leader will brief the staff on the records review which includes a focus on the needed areas of improvement in asthma management. Next, the project leader will meet with the providers and clinic staff to review the asthma protocol, ACT tool administration and asthma fact sheet interventions.

The post implementation chart review will occur approximately one to two weeks after completion of implementing the protocol. The chart review will include, 50 EMRs and will be randomly selected from eligible records for the post implementation data review. This concludes the project.

After the pre and post chart reviews are completed the data will be received by the project leader and used for the analysis process of comparing the findings from the pre and post protocol implementation review. The project results will be shared with the CEO, clinic manager, pediatric pulmonologist, clinic providers, clinic staff, with emphasis on continuous quality improvement.

Ethics and Human Subjects Protection

The practice site will not require separate IRB approval to carry out the quality improvement project. The protection of human rights will be maintained throughout the implementation of this evidence-based DNP project. All the clinical activities incorporated into the project are standard clinical procedures and consistent with established clinical guidelines. The participants in this project are the clinical providers and clinical staff at a pediatric clinic. To protect the participants no identifiers or names will be used during data collection and analysis of the information. Each record will be assigned a number in order to correspond to the RStudio. There are minimal risks to participating in the quality improvement project and there

will be no other compensation for participating in the project as it is mandatory for providers and staff to participate in clinic quality improvement projects.

Plan for Analysis/Evaluation

One of the objectives of the project will be to make the ACT and asthma protocol easily accessible to the providers. This will comprise of the successful incorporation of these tools into the management of asthma patient in the clinic setting. The project leader will collaborate with the pediatric pulmonologist, CEO of the clinic and office manager to integrate these tools effectively. The project will be measuring how the implementation of the asthma protocol will improve outcome variables such as asthma severity classification, ACT score, asthma controller medication use, SABA use and patient asthma education.

This project will use descriptive statistics (e.g., percentiles, frequencies, and correlations). The identified EMR parameters-asthma severity classification, ACT score, asthma controller medication prescribed and patient asthma education, will initially be evaluated as a symbol of the presence/absence of the criteria in the QI flow sheet (see Figure). Once the 50 EMRs are evaluated, each criterion will be calculated as a percentage of positive findings by using the RStudio. The difference between the before and after percentile scores will be compared in terms of statistical significance to evaluate the effect of the protocol implementation. The after-percentile scores will be hypothesized to be higher than the before scores, providing evidence to support the effectiveness of the protocol. Recommendation will be drawn from these data. A simple nominal frequency scale will be used for comparison of the total number of ACT tests per number of asthma records for each project periods. For this project a QI assessment test will be utilized. While the validity and reliability of this tool has not been studied, the parameters closely parallel the 2007 NAEPP EPR recommendation. The clinic has set a goal of meeting 75

% satisfaction when it performs QI. For the project the following parameters will be addressed, having a diagnosis of asthma, provider suggested follow-up visit, severity of asthma, asthma-controller medication prescribed, SABA use documented, documentation of ACT score and ACT administration, and asthma patient education. The project design will be a pre-and post-comparison of outcome measures. Demographic data will be analyzed using descriptive statistics (mean, SD, frequencies and percent). Secondary data will be measured as continuous data (ACT score), using a paired t-test. Categorical data was analyzed using nonparametric techniques to describe the EMR chart review based on diagnoses, severity of asthma, control of asthma, and asthma education. The first level of evaluation will be the analyses of the retrospective EMR chart review. The final analysis will be a comparison of the pre-and post-test data obtained using a paired –t-test using Minitab statistical software.

Presence of the parameters in the QI EMR review will meet the project expectations. The asthma QI review results will be presented to the clinic providers and staff with discussion about areas for improvement.

Significance/Implication for Nursing

This type of quality improvement project is well suited for a primary care practice office. There are resources readily available to ensure the success of this type of project. It is the 57 recommendations of the NAEPP (2007) expert guidelines for the diagnosis and treatment of asthma that all patients with asthma be properly assessed using the C-ACT. The asthma protocol may help patients and their families manage the disease and prevent and/or treat exacerbations. It may help reduce ED and acute care hospital visits. The success of this project may suggest that other providers will find that discussing and completing ACTs during patient visits and following the asthma protocol is feasible and must be integrated into all visits. The development

and implementation of the pediatric asthma protocol would meet the recommendations of the Institute of Medication (IOM 2010) recommendation which include:

• Nurses should practice to the full extent of their education and training.

• Nurses should achieve higher levels of education and training through an improved education system that promotes seamless academic progression.

• Nurses should be full partners, with physicians and other health professionals, in redesigning health care in the United States

• Effective workforce planning and policy making require better data collection and an improved information infrastructure

Analysis

The demographic data was analyzed using descriptive statistics (mean, SD, frequencies and percent). Secondary data was measured as continuous data (ACT score), using a paired t-test. The categorical data which included diagnoses, severity of asthma, asthma classification, control of asthma, asthma education, spacer prescribed, asthma controller medication were analyzed using nonparametric tests. The first level of evaluation included an analysis of the asthma registry database. The final analysis included a comparison of the pre and post implementation data using a paired –t-test. The analyses were completed by using the Statistical Package for the Social Sciences (SPSS) version 24.

The quality improvement project was implemented at a primary care practice, specializing in pediatrics located in southern Nevada. The analyzing of data included a report which was compiled from all charts through the electronic medical record for patients between the age group of 5 years to 8 years, having the diagnosis code of unspecific asthma diagnosis or reactive airway disease. It involved a broad range of diagnosis classification. This report resulted

in a list of 445 patients charts that fit these criteria. After visually checking each chart for proper diagnosis, the number was limited to 421. These charts were reviewed and included patient visits which occurred during the last one year. There were 421 patient charts for the 11 providers currently practicing at the clinic. From this list of charts an asthma registry was completed by randomly selecting 50 patient records for the DNP project see appendix 7A and B, tables 1a and 1b, graphs 1a and 1b. Prior to the quality improvement project, the C-ACT was not used at the clinic see appendix 9, table 3, graph, no severity rating and asthma classification was documented in the EMR, see appendix 11, table 5, graph 5, correct diagnosis was not listed in the problem list based on NAEPP guidelines see appendix 8, table 2, graph 2, the C-ACT was not routinely used see appendix 9, table 3, graph 3, and routine asthma follow-up was not adhered to at the clinic. The results showed that asthma control medication was not consistently prescribed by the providers at the clinic, see appendix 12, table 6, graph 6. The analysis of the data also indicated that there was no documentation of a formalized education program in place for patients with asthma, see appendix 12, table 7, graph 7.

As part of the analysis of the data a list was created to show all the key recommendations of the NAECPP guidelines and the NHLBI guidelines that were needed to be present in the EMR. These elements were also part of the recommendations that would satisfy the chart audit for the asthma collaborative program and to address asthma as one of clinic's chronic conditions. To make sure all the data was organized and available to staff the asthma registry file was created. In this file certain key elements were organized into excel spread sheets. These elements are: masked patient name, gender, and date of birth, specified asthma diagnosis, asthma classification. Other elements included the documentation of rescue inhaler see appendix 15, table 9, graph 9, if controller medication were prescribed, if C-ACT was administered and

recorded. Data was collected to determine when the last patient visit occurred, was asthma diagnosis with classification documented, was C-ACT scored and documented, was asthma controller medication prescribed, was asthma education reviewed by the provider and was a spacer device prescribed see appendix 12, table 8, graph 8.

There were a pre and post implementation EMR chart audit and the data were coded as 1 = Yes and 0 = No for each of the 8 parameters of the chart review. A "yes" indicated the parameter in question was covered in the asthma patient consultation whereas a "no" indicated the parameter was not covered, for the gender tab 0 = male and 1 = female, for asthma severity score 0= not applicable, 1= poorly controlled, 2=not well controlled, 3=well controlled. All not applicable responses were coded as 0, so as not to influence the means. A summative score was subsequently obtained for the two EMR reviews by adding all dimensions across charts, thus yielding a composite sum score with a possible range from 0-8 per chart review. Therefore, a higher EMR score suggested the parameters were appropriately covered with patients during consultations, whereas a lower score suggested that not all parameters were appropriately covered, if at all.

Discussion of Findings

This project included 50 EMR charts and two chart audits, pre-implementation chart audit and post implementation chart audit. Of the 50 EMR charts that were reviewed pre and post implementation, 64% were male and 36% were female, 30 % were in the 5-year age group, and 28 % were in the 8-year age group.

The pre-implementation findings of the chart audits showed that the practice had a quality gap prior to implementation of the project. The findings showed that there were 0% asthma severity specific diagnosis documented in the patient records and post implementation

chart audits showed that this number increased significantly after completing the project intervention. The pre-implementation chart audit findings showed that here were 0% documented C-ACT administration for the 5-8 year age group. The findings showed that post-implementation that the administration of the C-ACT increased to 94%. Similar findings were reported by Sudhanthar et al (2016) improved asthma control and assessment using ACT in a pediatric primary care setting using an asthma protocol.

The findings indicated 94% compliance with C-ACT administration post protocol implementation. The findings from the post implementation chart review indicated that the C-ACT scores showed 50% of the patients were not well controlled, 32% were well controlled, 12% were poorly controlled, and 3% of the time there was no chart documentation of C-ACT identified during the implementation phase. In addition, the crosstabulations between post implementation C-ACT scores and gender showed about 20% of males were poorly controlled asthma, while about 55% of females were not well controlled. The findings indicated an equal percentage of males and females of 30% were well controlled. The post-implementation findings of the EMR chart review findings indicated that asthma severity was classified as mild asthma 70% and moderate asthma 30%. The findings showed that the post-implementation chart review indicated that between genders the asthma severity of mild asthma among males was 60% and among females was 78% and there were 22% of males with moderate asthma as well as females.

The findings of the post implementation chart review indicated that controller medications were prescribed 92% of the time and 8% of the time they were not prescribed. The findings of the pre-implementation chart review showed that 2% of the time there was a documented controlled medication and 98% of the time there were not controller medications prescribed. The findings of the pre-implementation chart review indicated there were 0% asthma

education documented and post implementation chart review showed that there were 100% documentation of asthma education by providers. In addition, the findings showed that the pre-implementation chart audit indicated that the documentation of the spacer device was 0% and that the post implementation chart reviews indicated that the documentation of prescribed spacer device was 100%. The pre-implementation and post-implementation chart reviewed results indicated that a rescue inhaler was prescribed 100% of the time, this coincides with several national asthma guidelines recommendations for SABA use as the first step and as-needed treatment of asthma (Sen, et al., 2011)

Significance/Implications to Nursing

The results of this project indicated that there is an importance for correct documentation in the records of asthma patients in order to provide a clear diagnosis and severity rating of asthma based on NAEPP guidelines and a reason for the clinic visit. This documentation will provide a process for providers to follow to promote quality patient outcomes. The results of this project indicated that patients need an obvious reason for the clinic visit at similar practice settings. Because of this project it is important in a clinic setting to instruct providers and medical staff on the asthma guidelines and any existing or new protocols to improve the quality of the organizational practice and patient outcomes. This project will provide new insight into the existing knowledge where gaps were discovered. Because of this project the clinic setting has a protocol in place on how to manage patient visits with a diagnosis of asthma. This protocol can be duplicated at other clinic setting with comparable results.

The burden of pediatric asthma continues to be a significant problem due to the challenges primary care pediatricians face in implementing asthma guidelines. But this project proved that use of evidence-based asthma protocol can bring a change in providers' behavior by

increasing their knowledge, skill, and self-efficacy in managing pediatric asthma using NAEPP guidelines.

Bui et al (2017) suggested that lower lung function in early life because of factors affecting lung function during childhood, such as maternal smoking and childhood asthma, bronchitis, allergic rhinitis, and eczema, predisposed children to lung function decline and COPD later in life. Therefore, healthcare providers use of evidence-based protocol management of asthma in children and in pediatric clinics is expected to improve the quality of patient outcomes.

Limitations

There were several limitations to this project. The first limitation is that the eight parameters tool was not tested for reliability or validity. The eight parameters were from the 2007 NAEPP EPR 3 guidelines, and the documentation in the EMR was not always following a parameter which supported the national guidelines. Another limitation is during the analysis of the study, the results demonstrated asthma severity as mild, moderate and severe types of the asthma. The subtypes of asthma severity like the intermittent and persistent types were lumped together and taken into account while reporting. This could be addressed in future studies.

In addition, another limitation was the required timeframe of the project. The timeframe was three months of time for the project. A longer time frame would have allowed for further results. Another limitation was the number of charts that provided the needed patient information. The chart information included data from a varied age range of patients and did not include a wide variety of ethnicities. This could also be due to the location and the underserved area of the practice. Even though there was no cost saving analysis done, because of the protocol implementation, assessing severity and control of asthma in visits other than the scheduled asthma visits by preventing potential emergency or urgent care visits, guidelines suggest

continued monitoring of asthma severity is a crucial step to save valuable health care expense (Sudhanthar et al, 2016).

Dissemination

The findings of the DNP project will be shared with pediatric clinic staff during a staff meeting event to be scheduled following project completion. The project paper and results will be submitted for publication in a peer-reviewed journal. The journal identified for submission of this manuscript is the Journal of Doctoral Nursing Practice which is a biannual, peer-reviewed publication focused on clinical excellence of the application of evidence-based practice of doctoral nursing.

Once formatted per the publisher's requirements, the manuscript will be submitted as a DNP QI project paper. It is anticipated that the manuscript will be ready for submission within one month of graduation.. If this is an area of interest to the journal, the manuscript will be revised based on the reviewers' recommendations and resubmitted for publication. Depending on the volume of manuscripts in production, the anticipated time to publication may be up to six months to one year. Initially the manuscript will be given a digital object identifier (DOI) number and will appear electronically before the article appears in hardcopy format.

References

About the American Academy of Pediatrics - HealthyChildren.org. (2017). Retrieved from https://www.healthychildren.org/english/pages/about-aap.aspx

American College Health Association (ACHA). (2009). Chronic care measure - asthma action plans and use of steroid inhalers for those with mild persistent asthma or greater. http://www.acha.org/projects_programs/ClinicalBenchmarkingSurvey_Asthma.cfm

American Association of Colleges of Nursing. (2006). The Essentials of Doctoral Education for Advanced Practice Nursing. Retrieved on July 24th, 2017 from http://www.aacn.nche.edu/dnp/Essentials.pdf.

Bender, M., Connelly, C. D., Brown, C. (2013). Interdisciplinary collaboration: the role of the clinical nurse leader. Journal of Nursing Management, 21(1), 165-174. doi:10.1111/j.1365-2834.2012.01385.x

Burgers, J., Smolders, M., Weijden, T., Davis, D., & Grol, R. (2013). Clinical practice guidelines as a tool for improving patient care. *Improving Patient Care*, 91-114. doi:10.1002/9781118525975.ch6

Bousquet, J., Clark, T. J., Hurd, S., Khaltaev, N., Lenfant, C., O'Byrne, P., & Sheffer, A. (2007). GINA guidelines on asthma and beyond. Allergy, 62(2). doi:10.1111/j.1398-9995.2006.01305.x

Bui, D. S., Burgess, J. A., Lowe, A. J., Perret, J. L., Lodge, C. J., Bui, M., . . . Dharmage, S. C. (2017). Childhood lung function predicts adult chronic obstructive pulmonary disease and Asthma–Chronic obstructive pulmonary disease overlap syndrome. *American Journal of Respiratory and Critical Care Medicine, 196*(1), 39-46. doi:http://dx.doi.org/10.1164/rccm.201606-1272OC

Camargo Jr., C. A., Rachelefsky, G., & Schatz, M. (2009). Managing asthma exacerbations in the emergency department: Summary of the National Asthma Education and Prevention Program Expert Panel Report 3 guidelines for the management of asthma exacerbations. Journal of Allergy and Clinical Immunology, 124(2), S5-S14. doi:10.1016/j.jaci.2009.05.010.

CDC. (2016). Asthma's Impact on the Nation, Accessed from https://www.cdc.gov/asthma/impacts_nation/asthmafactsheet.pdf.

CDC Media Relations. (2017). Retrieved from https://www.cdc.gov/media/subtopic/questions.htm

Carlton, B. G., Lucas, D. O., Ellis, E. F., Conboy-Ellis, K., Shoheiber, O., & Stempel, D. A. (2005). The status of asthma control and asthma prescribing practices in the United States: Results of a large prospective asthma control survey of primary care practices. Journal of Asthma, 42(7), 529-535. doi:10.1082/JAS-200067000

Delaronde, S., Peruccio, D. L., & Bauer, B. J. (2005). Improving asthma treatment in a managed care population. The American Journal of Managed Care, 11(6), 361-368.

Deming, W. E. (1993). The new economics for industry, government, education (2nd ed.). Cambridge, MA: Massachusetts Institute of Technology.

Deschildre, A., Pin, I., El Abd, K., Belmin-Larrar, S., El Mourad, S., Thumerelle, C., … & de Blic, J. (2014). Asthma control assessment in a pediatric population: Comparison between GINA/NAEPP guidelines, childhood asthma control test (C-ACT), and physician's rating. Allergy, 69, 784–790. doi: 10.1111/all.12402

Dexheimer, J. W., Borycki, E. M., Chiu, K., Johnson, K. B., & Aronsky, D. (2014). A systematic review of the implementation and impact of asthma protocols. BMC Medical

Informatics and Decision Making, 14, 82. doi:http://dx.doi.org/10.1186/1472-6947-14-82.

FastStats - Asthma. (n.d.). Retrieved from https://www.cdc.gov/nchs/fastats/asthma.htm.

Field, M. J., Lohr, K. N., Institute of Medicine (U.S.), & United States. (1990). *Clinical practice guidelines: Directions for a new program*.

Eder, W., Ege, M. J., & Von Mutius, E. (2006). The Asthma Epidemic. New England Journal of Medicine, 355(21), 2226-2235. doi:10.1056/nejmra054308.

Gustafsson, P. M., Watson, L., Davis, K. J., & Rabe, K. F. (2006). Poor asthma control in children:evidence from epidemiological surveys and implications for clinical practice. *International Journal of Clinical Practice*, *60*(3), 321-334. doi:10.1111/j.1368-5031.2006.00798.x

Halbert, R. J., Tinkelman, D. G., Globe, D. R., & Shao-Lee Lin. (2009). Measuring asthma control is the first step to patient management: A literature review. Journal of Asthma, 46(7), 659-664. doi:10.1080/02770900902963128

Institute of Medicine. (2010). The future of nursing: Leading change, advancing health. Retrieved from http://books.nap.edu/openbook.php?record_id=12956&page=R1

Jones, M. A. (2008). Asthma self-management patient education. Respiratory Care, 53(6), 778-786.

Kestila, L., Koskinen, S., Martelin, T., Rahkonen, O., Pensola, T., Aro, H., & Aromaa, A. (2005). Determinants of health in early adulthood: What is the role of parental education, childhood adversities and own education? European Journal of Public Health, 16(3), 305-314.

Lee, G. B., & Le, T., T. (2013). Training Pediatricians to Adhere to Asthma Guidelines. *Journal of Pediatric, allergy, immunology and pulmonology*, 26(3), 110-114. DOI: 10.1089/ped.2013.0265

Liu, A., Zeiger, R., Sorkness, C., Mahr, T., Ostrom, N., Burgess, S., … Manjunath, R. (2007). Development and cross-sectional validation of the childhood asthma control test. Journal of Allergy and Clinical Immunology, 119, 817–825. doi: 10.1016/j.jaci.2006.12.662

Masoli, M., Fabian, D., Holt, S., & Beasley, R. (2004). The global burden of asthma: executive summary of the GINA Dissemination Committee Report. Allergy, 59(5), 469-478. doi:10.1111/j.1398-9995.2004.00526.x

Melosini, L., Dente, F., Bacci, E., Bartoli, M., Cianchetti, S., Costa, F., … Paggiaro, P. (2012). Asthma control test (ACT): Comparison with clinical, functional, and biological markers of asthma control. Journal of Asthma, 49, 317–323. doi: 10.3109/02770903.2012.661008

McLaughlin, C., & Kaluzny, A. (2006). Continuous quality improvement in health care: Theory, implementations and applications. Boston: Jones and Bartlett.

Mishra, N., Rao, K. V. R., & Padhi, S. K. (2005). Asthma education for better compliance in disease management. Indian Journal of Allergy Asthma Immunology, 19(1), 25-28.

Moen, R.D., & Norman, C.L. (2010). Circling Back: Clearing up myths about the Deming cycle and seeing how it keeps evolving. Quality Progress.com. Retrieved from: http://www.apiweb.org/circling-back.pdf

National Heart, Lung, and Blood Institute. ([NHLBI], 2010). National asthma education and prevention program expert panel report 3: Guidelines for the diagnosis and management of asthma. Full Report 2007 (NIH Publication No. 10 - 4051). Bethesda, MD: National Institute of Health.

O'Byrne, P. M., Pedersen, S., Schatz, M., Thoren, A., Ekholm, E., Carlsson, L., & Busse, W. W. (2013). The Poorly Explored Impact of Uncontrolled Asthma. *Chest, 143*(2), 511-523. doi:10.1378/chest.12-0412

Pearson, W. S., Goates, S. A., Harrykissoon, S. D., & Miller, S. A. (2014). State-Based Medicaid Costs for Pediatric Asthma Emergency Department Visits. *Preventing Chronic Disease, 11*. doi:10.5888/pcd11.140139

Kuilboer, M. M., Van Wijk, M. A., Mosseveld, M., & Van der Lei, J. (2003). AsthmaCritic: Issues in Designing a Noninquisitive Critiquing System for Daily Practice. Journal of the American Medical Informatics Association, 10(5), 419-424. doi:10.1197/jamia.m1273.

QuickStats: Percentage of Children Aged <18 Years Who Have Ever Had Asthma Diagnosed, by Age Group --- United States, 2003. (2005). Retrieved from https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5416a5.htm

RStudio. (2018). Retrieved from https://www.rstudio.com/

Self, T. H., Usery, J. B., Howard-Thompson, A. M., & Sands, C. (2007). Asthma treatment protocols in the emergency department: Are they effective? Journal of Asthma, 44(4), 243-248. doi:10.1080/02770900701246691

Sen, E. F., Verhamme, K. M., C., Neubert, A., Hsia, Y., Murray, M., . . . M. (2011). Assessment of pediatric asthma drug use in three european countries; a TEDDY study. *European Journal of Pediatrics, 170*(1), 81-92. doi:http://dx.doi.org/10.1007/s00431-010-1275-7

Sudhanthar, S., Turner, J., Sigal, Y., Thakur, K., & Gold, J. (2016). Improving asthma severity and control screening in a primary care pediatric practice. *BMJ Quality Improvement Reports, 5*(1) doi:http://dx.doi.org/10.1136/bmjquality.u209517.w4133

Tumiel-Berhalter, L., & Hershey, C. O. (2005). Encouraging a systems approach for adherence

to national asthma guidelines. Journal of Asthma, 42(7), 593-595. doi:10.1080/02770900500216200

APPENDIX 1

asthma.com

Patient's Name: _____

Today's Date: _____

Childhood Asthma Control Test for children 4 to 11 years

Know your score.

Parent or Guardian: The Childhood Asthma Control Test* is a way to help your child's healthcare provider determine if your child's asthma symptoms are well controlled. Take this test with your child (ages 4 to 11). Share the results with your child's healthcare provider.

Step 1: Have your child answer **the first four questions (1 to 4).** If your child needs help, you may help, but let your child choose the answer.

Step 2: Answer the last **three questions (5 to 7)** on your own. Don't let your child's answers influence yours. There are no right or wrong answers.

Step 3: Write the number of each answer in the score box to the right.

Step 4: Add up each score box for the total.

Step 5: Take the COMPLETED test to your child's healthcare provider to talk about your child's total score.

19 or less

IF YOUR CHILD'S SCORE IS 19 OR LESS, **Your child's asthma symptoms may not be as well controlled as they could be. No matter what the score, bring this test to your child's healthcare provider to talk about your child's results.**

NOTE: If your child's score is 12 or less, his or her asthma may be very poorly controlled. Please contact your child's healthcare provider right away.

Have your child complete these questions.

1. How is your asthma today?

0	1	2	3	SCORE
Very bad	Bad	Good	Very good	

2. How much of a problem is your asthma when you run, exercise or play sports?

0	1	2	3	
It's a big problem, I can't do what I want to do.	It's a problem and I don't like it.	It's a little problem but it's okay.	It's not a problem.	

3. Do you cough because of your asthma?

0	1	2	3	
Yes, all of the time.	Yes, most of the time.	Yes, some of the time.	No, none of the time.	

4. Do you wake up during the night because of your asthma?

0	1	2	3	
Yes, all of the time.	Yes, most of the time.	Yes, some of the time.	No, none of the time.	

Please complete the following questions on your own.

5. During the last 4 weeks, how many days did your child have any daytime asthma symptoms?

5	4	3	2	1	0	
Not at all	1-3 days	4-10 days	11-18 days	19-24 days	Everyday	

6. During the last 4 weeks, how many days did your child wheeze during the day because of asthma?

5	4	3	2	1	0	
Not at all	1-3 days	4-10 days	11-18 days	19-24 days	Everyday	

7. During the last 4 weeks, how many days did your child wake up during the night because of the asthma?

5	4	3	2	1	0	
Not at all	1-3 days	4-10 days	11-18 days	19-24 days	Everyday	

TOTAL

*The Childhood Asthma Control Test was developed by GSK.

This material was developed by GSK.

Appendix 2

Asthma Project Protocol

STEP 1 Project Leader

_____Electronic medical chart review for patient with RAD, unspecified asthma and age group 5 year to 8 years and create asthma registry.

_____Call and schedule patient visit.

STEP 2 Clinical Medical Assistants

_____Obtain vital signs, checks EMR for diagnosis-RAD, other asthma and age 5-8 yrs.

_____Review current medication history and allergy history

_____Administers C-ACT

STEP 3 Pediatricians, NPs and Pas

_____Clinical exam, scores and reviews C-ACT with patient and parent

_____Review current medication (medication history, adherence, technique)

_____Review proper asthma diagnostic category: Intermittent, Mild, Moderate, Severe

_____Document level of control

_____Recommend changes to therapy based on C-ACT and clinical exam.

_____Offer and review CDC asthma fact sheets

_____Recommend and conform follow-up visit and or referral to higher level of care.

STEP 4 Follow-up Visit

_____Repeat C-ACT

_____Update medication list if needed

_____Review and update changes to asthma severity and medication.

_____Identify need for further education

_____Provide referrals as needed.

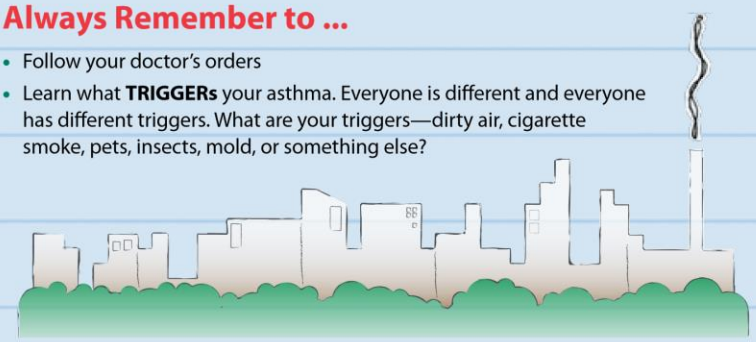
Name:_____

Signature_____ Date of Completion: _____

APPENDIX 3A

Always Remember to ...

- Follow your doctor's orders
- Learn what **TRIGGERs** your asthma. Everyone is different and everyone has different triggers. What are your triggers—dirty air, cigarette smoke, pets, insects, mold, or something else?



- If you have been running or playing and feel out of breath, stop and take a break!
- Know the warning signs of an asthma attack
  - » Wheezing and coughing
  - » Breathing too hard and too fast
  - » A feeling of tightness in your chest
- Whenever you leave the house, always take your **QUICK HELP** inhaler with you!

When you exercise, you will help your asthma... IF you follow these tips

Go easy — start exercising slowly and finish your exercise with a cool-down.

Take a buddy — play or excercise with a friend.

Know your triggers — stay away from the things that can trigger your asthma.

Take breaks — they will help you catch your breath. And drink plenty of water.

Mix it up — do different activities, like inline skating one day and taking a long walk the next day.

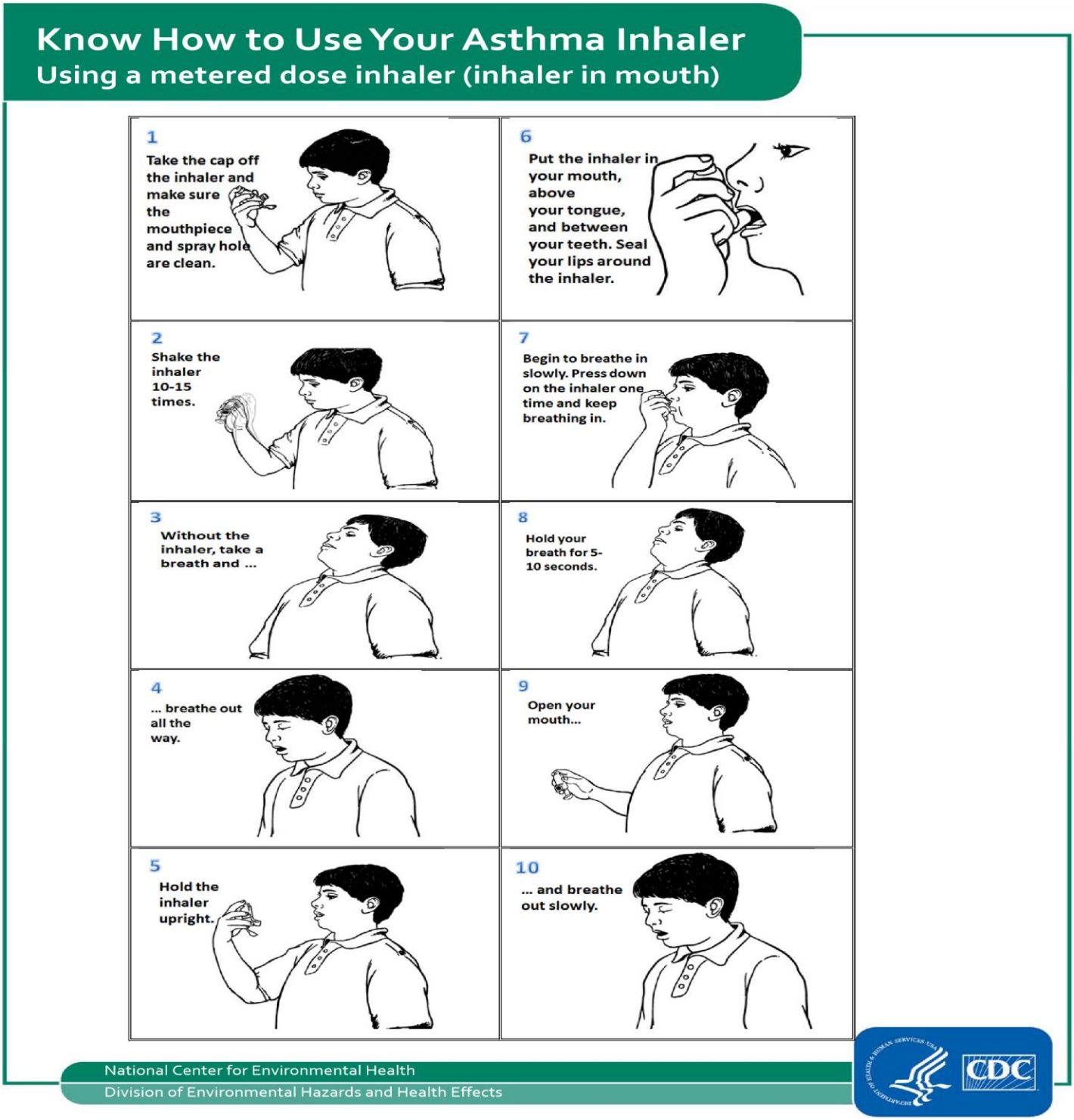
Check air quality — exercise outside only when the air is clean. Before you exercise, check the weather on TV or on a computer to see how clean the air is.

In 2000, more than one quarter of the swimmers on the US Olympics team had asthma and used inhalers.

Asthma didn't hold them back and asthma shouldn't hold YOU back!!!

Note: The next update of this fact sheet is scheduled for June 2011. More recent information may be available at the CDC's Air Pollution and Respiratory Health Branch's Asthma Web site at http://www.cdc.gov/asthma.

APPENDIX 3B


Know How to Use Your Asthma Inhaler
Using a metered dose inhaler (inhaler in mouth)
1
Take the cap off the inhaler and make sure the mouthpiece and spray hole are clean.
2
Shake the inhaler 10-15 times.
3
Without the inhaler, take a breath and ...
4
... breathe out all the way.
5
Hold the inhaler upright.
6
Put the inhaler in your mouth, above your tongue, and between your teeth. Seal your lips around the inhaler.
7
Begin to breathe in slowly. Press down on the inhaler one time and keep breathing in.
8
Hold your breath for 5-10 seconds.
9
Open your mouth...
10
... and breathe out slowly.
National Center for Environmental Health
Division of Environmental Hazards and Health Effects
CDC

Appendix 4

Patients aged 5-11 years Asthma control assessment and treatment recommendations.

CLINICAL ASSESSMENT	**WELL CONTROLLED ASTHMA**	**NOT WELL CONTROLLED ASTHMA**	**VERY POORLY CONTROLLED ASTHMA**
ACT SCORE	>20	13-19	<12
CLINICAL ASSESSEMENT			
Symptoms	<2days/week	>2days/week	Throughout the day
Nighttime awakening	<1x/month	>2x/month	>2x/week
SABA use	<2 days/week	>2 days/week	Several times a day
Interference with normal activity	None	Some Limitation	Extreme limitation
Exacerbation requiring Systemic corticosteroids	<1x/year	2-3 x/year	>3 x/year

Adapted from 2007 NHLBI: Guidelines for the diagnosis and Management of Asthma

APPENDIX 5

PEDIATRIC ASTHMA PROJECT announcement

All pediatricians, providers and clinical medical assistants of Sunrise Pediatrics

Asthma project details and childhood asthma control test will be discussed. Provider and staff input encouraged

During lunch hour date to be

TO BE DECIDED PEDIATRIC ASTHMA

Event Description Heading

We are excited to participate in a pediatric asthma project; whose purpose is the development and implementation of an evidence based pediatric asthma protocol to assist in the care of patients in a pediatric outpatient clinic. Improvement indicated by compliance of NAEPP EPR3 guidelines is demonstrated by the literature and can be measured using chart reviews of patient electronic medical records (EMR). The protocol employed as a quality improvement tool may improve the treatment outcomes for the pediatric patient with asthma.

Sunrise Pediatrics, Las Vegas, NV.

SUNRISE PEDIATRICS
3061 S.Maryland Pkwy #101
Las Vegas, NV 89109

7022545437

http://www.sunrisepediatricslasvegas.com

APPENDIX 6

GSKResponse Center (/callback)

Healthcare Professional Form

GlaxoSmithKline respects the privacy of visitors to its Web sites. Please see our privacy statement (http://us.gsk.com/en-us/privacy/) for more information.

Please fill out the form below to request product samples and savings offers, identify a GSK Sales Professional in your area, or for any other non-medical request.

* indicates a requiredfield.

Personal Information

* First Name

KESHAVAN

* Last Name

KODANDAPANI

* Specialty

Other HCP

*Address

3061 S.MARYLAND PKWY, STE 101

Room/Apt/Route #

*City

LAS VEGAS

*State

Nevada

*Zip Code

89109

*
Email Address

dnp18b.keshavan.kodandapani@nv.tou

*Phone Number

(702) - 462 - 0942

Contact Preferences

*How would you like us to contact you?

Email

Phone

•k Comments & Questions

Hello,
I am enrolled in the Doctor of Nursing program at Touro University Nevada, and pursing a quality improvement project as part of the Doctoral Program. I have chosen pediatric asthma as my project. I am interested in the childhood asthma control test developed by you, for my project. Requesting permission to use this asthma control tool in my project.
Appreciate your consideration and response in the matter,

Sincerely,

Keshavan,K

Our secure server ensures that your message cannot be read as it travels through the Internet. We try to respond to all messages promptly. If you don't receive a reply within 2 business days, please call us at 1-888-825-5249 (tel:18888255249).

https:!/contactus.gsk.com/callback/hcp.,htfn!

Reset Submit

Hours of Operation

1-888-825-5249
(tel:18888255249)
Monday through Friday
8:30 am - 5:30 pm, ET
Closed holidays

Additional Resources

GSK in the United States (http://us.gsk.com/)

Medicine Savings (http://www.gskforyou.com) I Legal Notices (http://us.gsk.com/en-us/legalnotices) Privacy Statement (http://us.gsk.com/en-us/privacy/) - Updated I Interest-based Ads (http://us.gsk.com/en-us/about-our-ads/) I Unsubscribe (/globalsalesoptout.html)

(http://us.gsk.com)

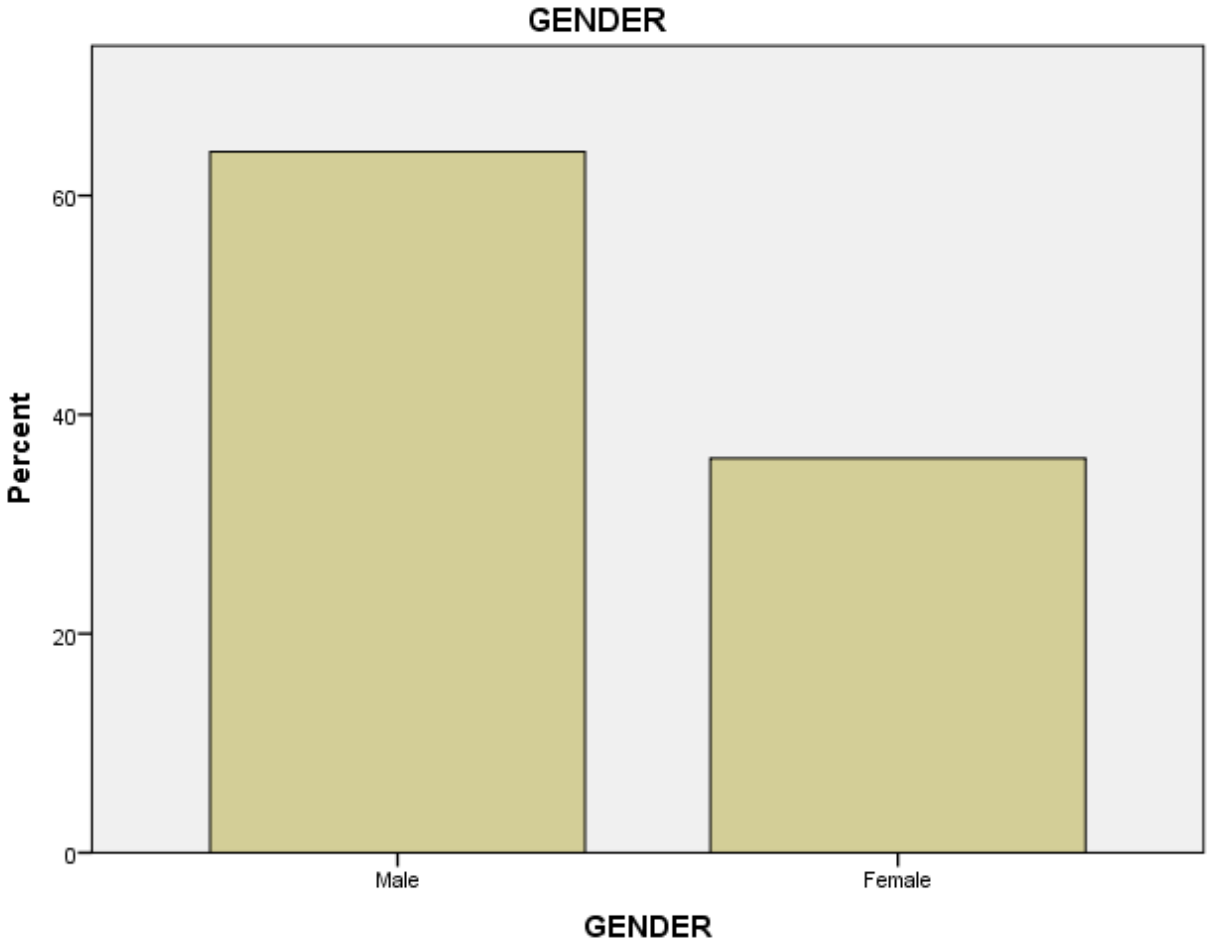
Appendix 7A

Table 1

Demographics of Patients in Project Based on Gender

GENDER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	32	64.0	64.0	64.0
	Female	18	36.0	36.0	100.0
	Total	50	100.0	100.0	



Graph1A

Appendix 7B

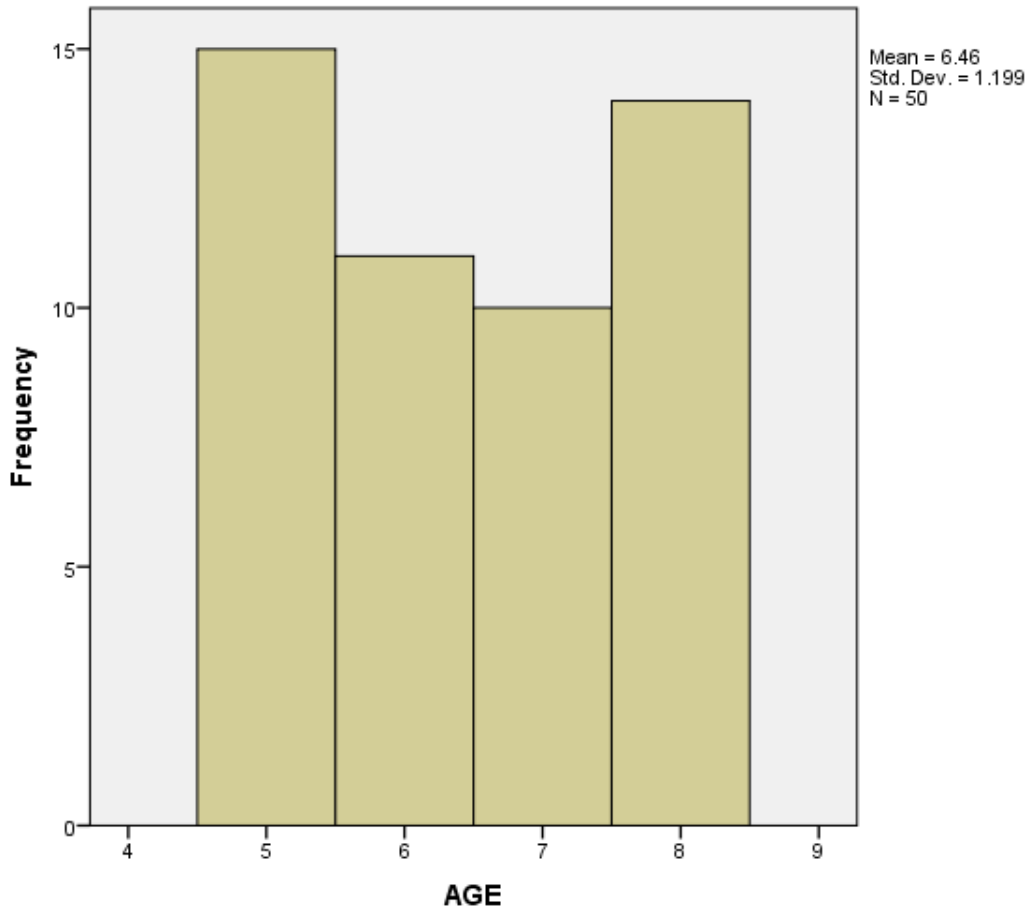
Table 7B

Group Statistics

	GENDER	N	Mean	Std. Deviation	Std. Error Mean
AGE	Male	32	6.41	1.214	.215
	Female	18	6.56	1.199	.283

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
AGE	Equal variances assumed	.046	.831	-.419	48	.677	-.149	.356	-.866	.567
	Equal variances not assumed			-.421	35.749	.677	-.149	.355	-.869	.571



Graph 7B

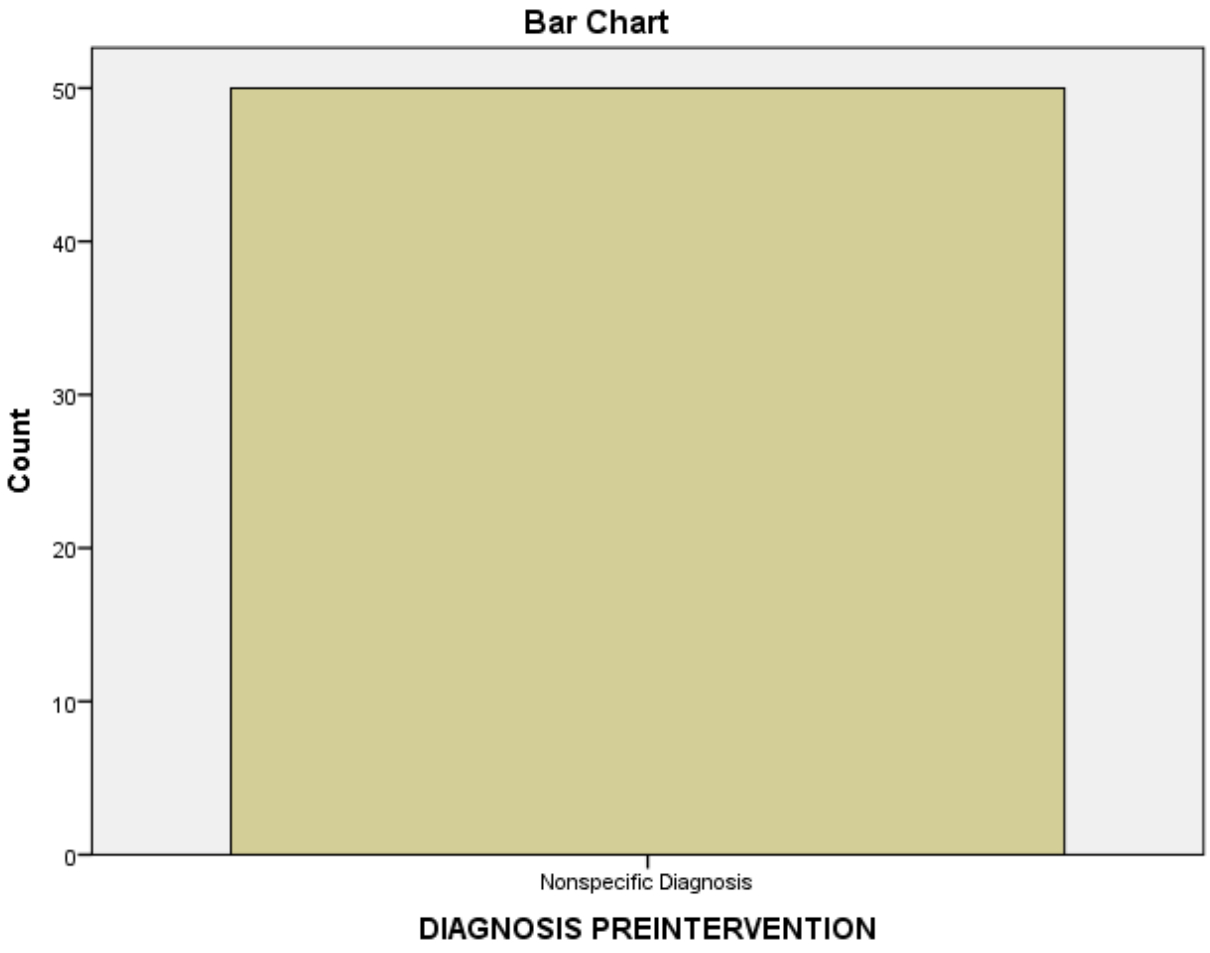
Appendix 8

Table 2

DIAGNOSIS PREINTERVENTION * DIAGNOSIS POSTINTERVENTION Crosstabulation

Count

		DIAGNOSIS POSTINTERVENTION	
		Specific Diagnosis	Total
DIAGNOSIS PREINTERVENTION	Nonspecific Diagnosis	50	50
Total		50	50



Graph 2

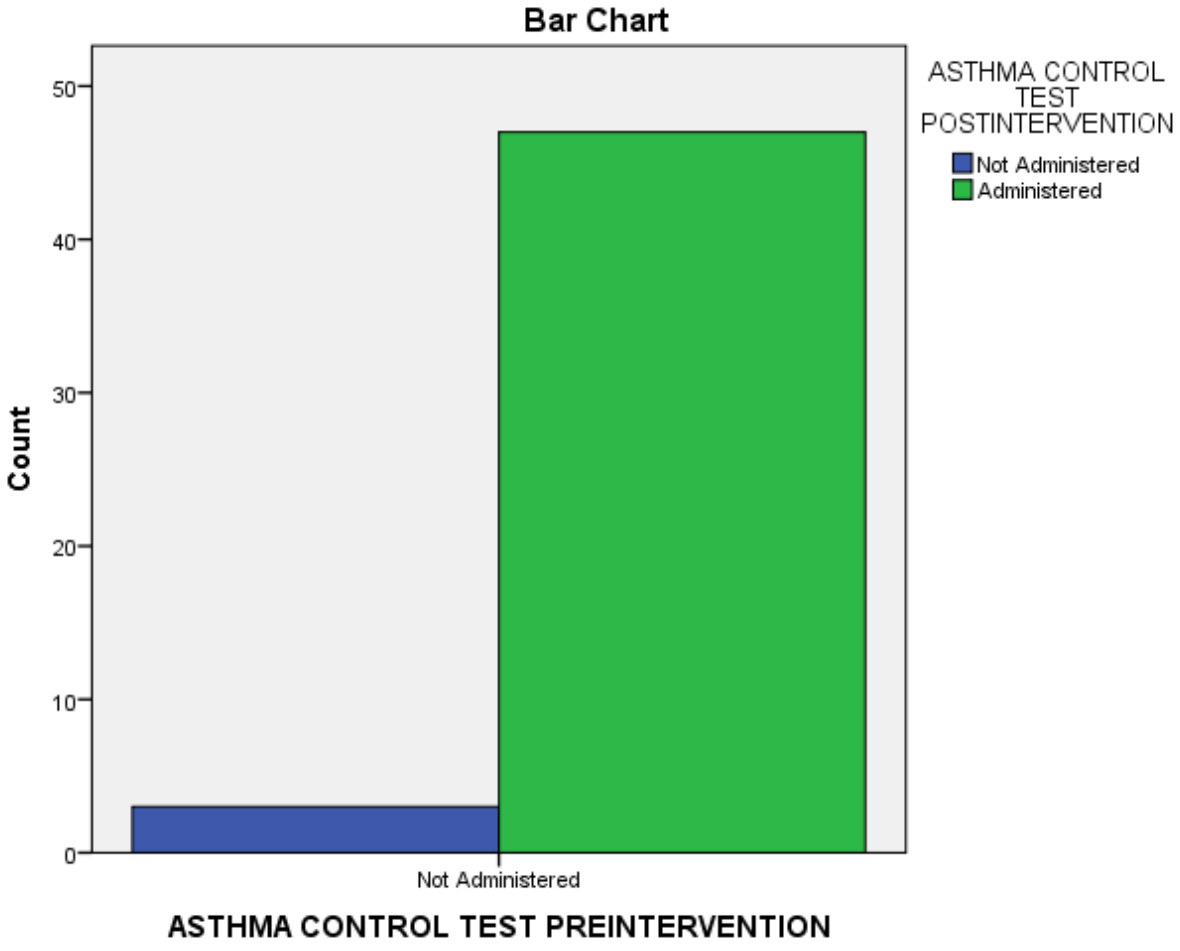
Appendix 9

Table 3

ASTHMA CONTROL TEST PREINTERVENTION * ASTHMA CONTROL TEST POSTINTERVENTION Crosstabulation

Count

		ASTHMA CONTROL TEST POSTINTERVENTION		
		Not Administered	Administered	Total
ASTHMA CONTROL TEST PREINTERVENTION	Not Administered	3	47	50
Total		3	47	50



Graph 3

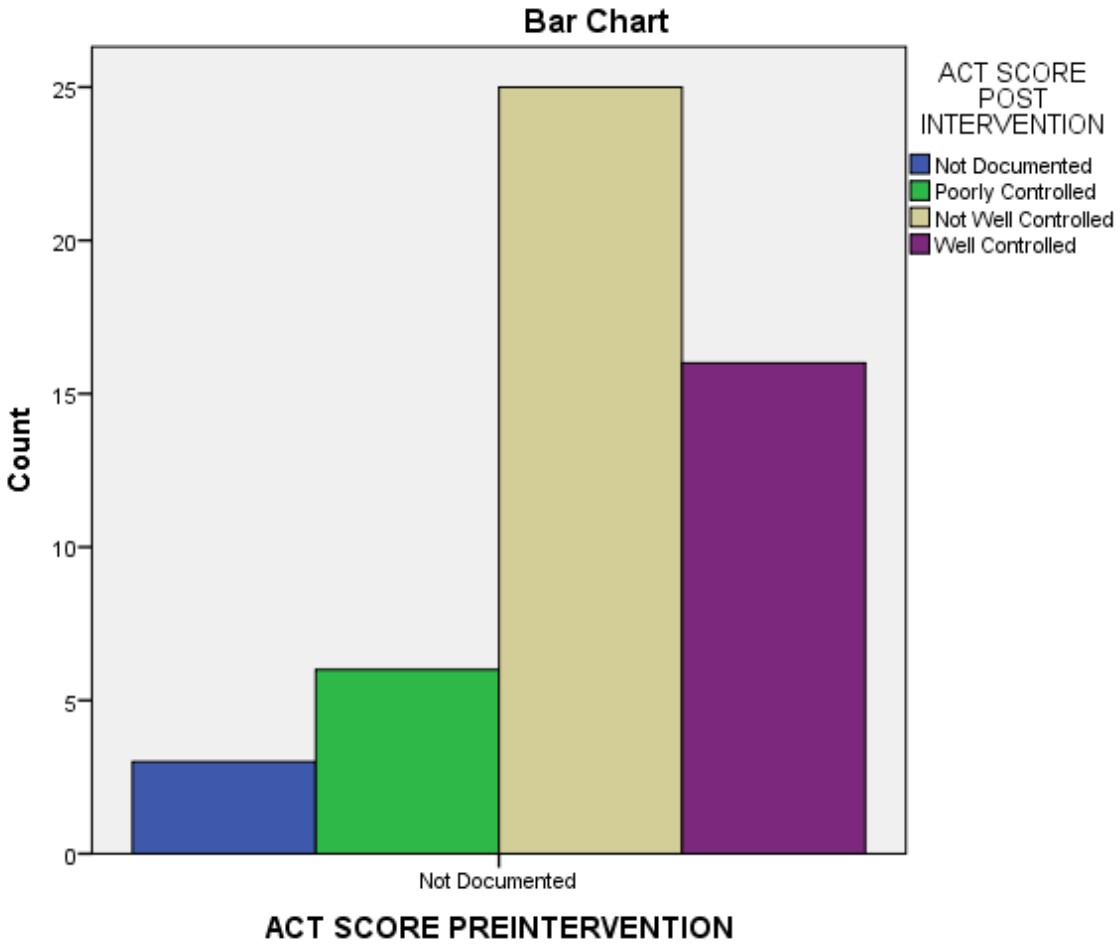
Appendix 10

Table 4

ACT SCORE PREINTERVENTION * ACT SCORE POST INTERVENTION Crosstabulation

Count

		ACT SCORE POST INTERVENTION				
		Not Documented	Poorly Controlled	Not Well Controlled	Well Controlled	Total
ACT SCORE PREINTERVENTION	Not Documented	3	6	25	16	50
Total		3	6	25	16	50



Graph 4

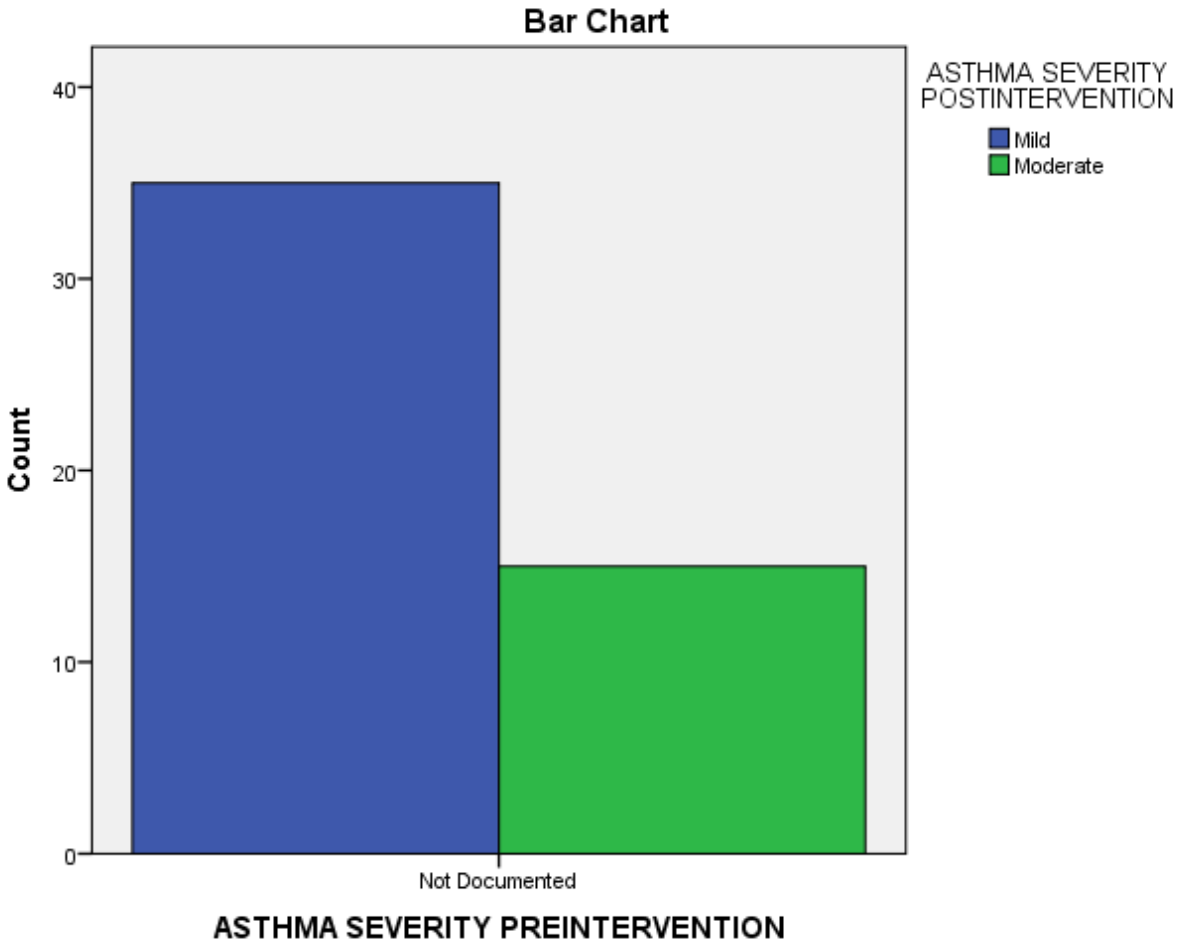
Appendix 11

Table 5

ASTHMA SEVERITY PREINTERVENTION * ASTHMA SEVERITY POSTINTERVENTION Crosstabulation

Count

		ASTHMA SEVERITY POSTINTERVENTION		
		Mild	Moderate	Total
ASTHMA SEVERITY PREINTERVENTION	Not Documented	35	15	50
Total		35	15	50



Graph 5

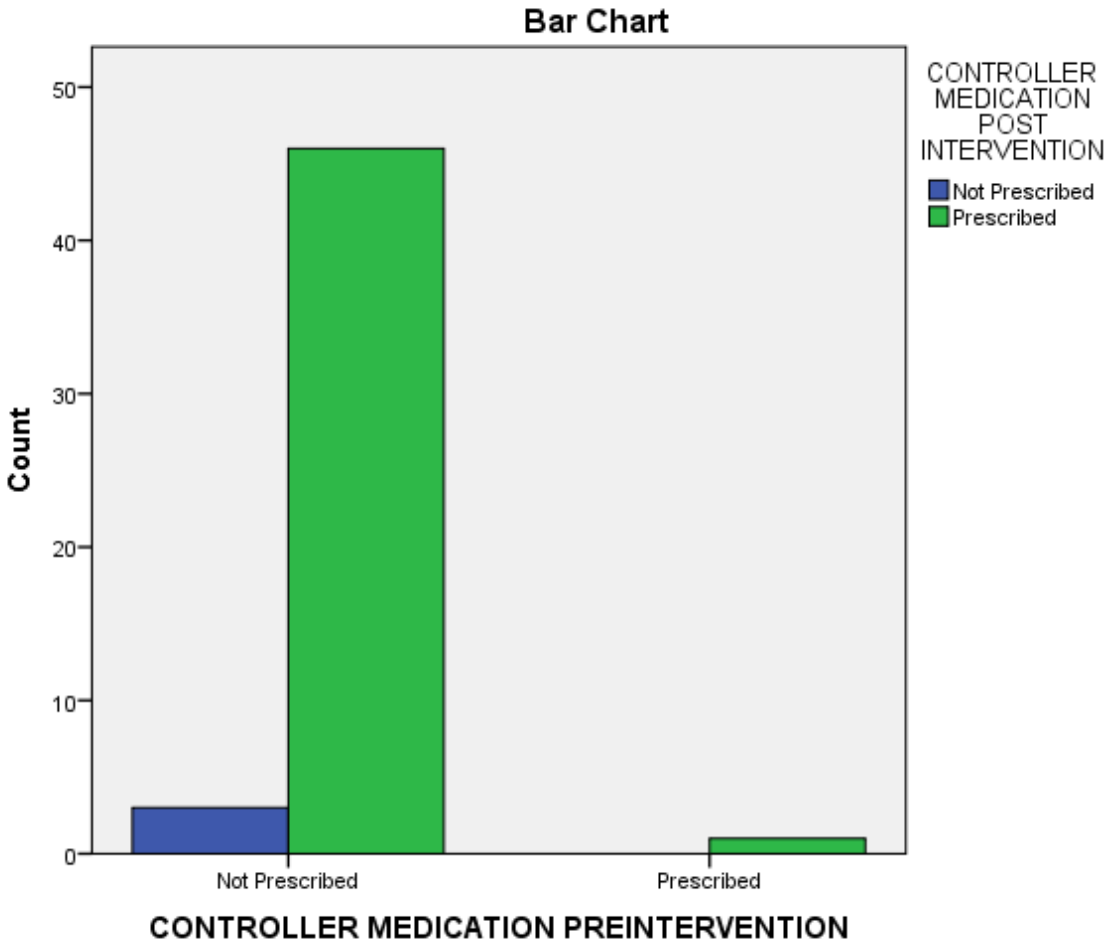
Appendix 12

Table 6

CONTROLLER MEDICATION PREINTERVENTION * CONTROLLER MEDICATION POST INTERVENTION Crosstabulation

Count

		CONTROLLER MEDICATION POST INTERVENTION		
		Not Prescribed	Prescribed	Total
CONTROLLER MEDICATION PREINTERVENTION	Not Prescribed	3	46	49
	Prescribed	0	1	1
Total		3	47	50



Graph 6

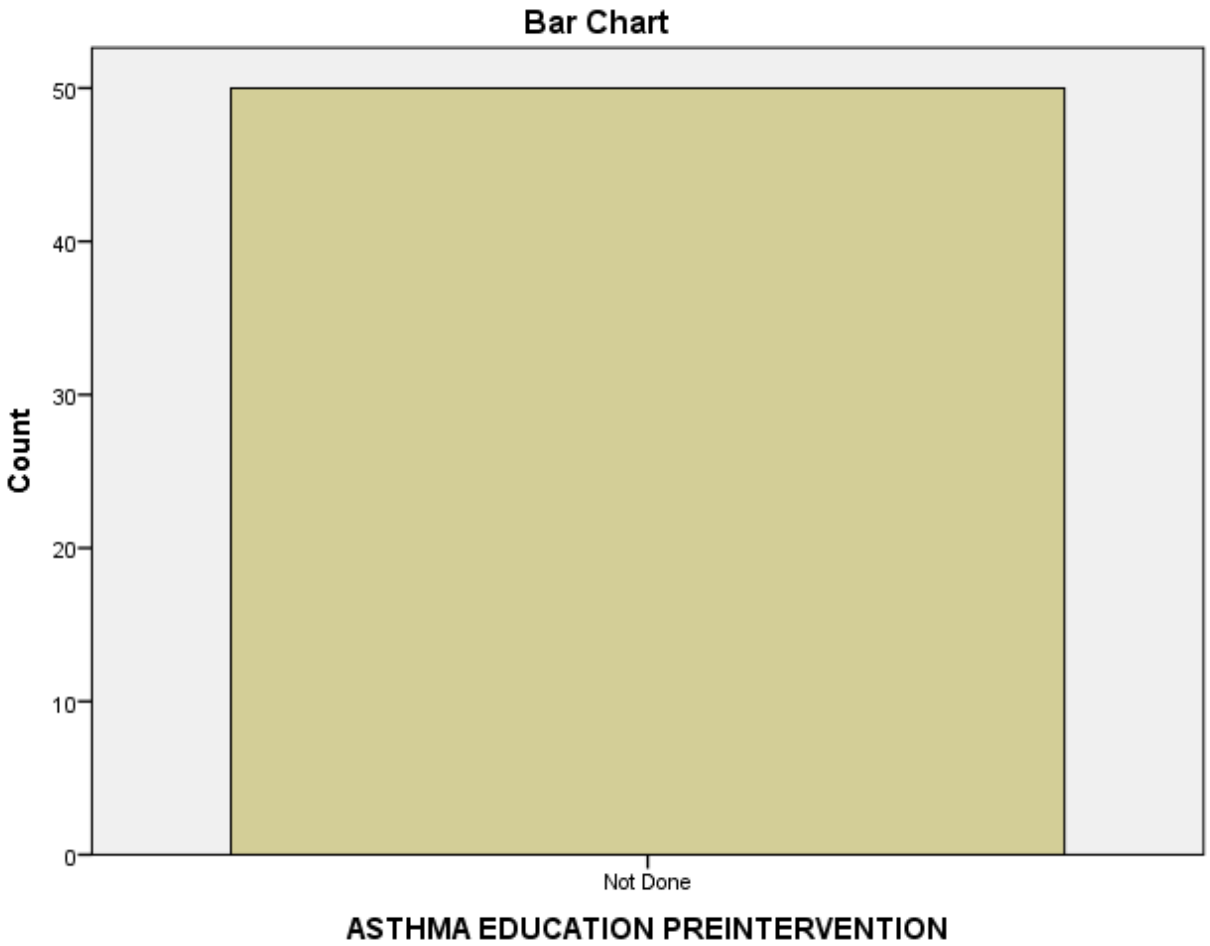
Appendix 13

Table 7

ASTHMA EDUCATION PREINTERVENTION * ASTHMA EDUCATION POSTINTERVENTION Crosstabulation

Count

		ASTHMA EDUCATION POSTINTERVENTION	
		Done	Total
ASTHMA EDUCATION PREINTERVENTION	Not Done	50	50
Total		50	50



Graph 7

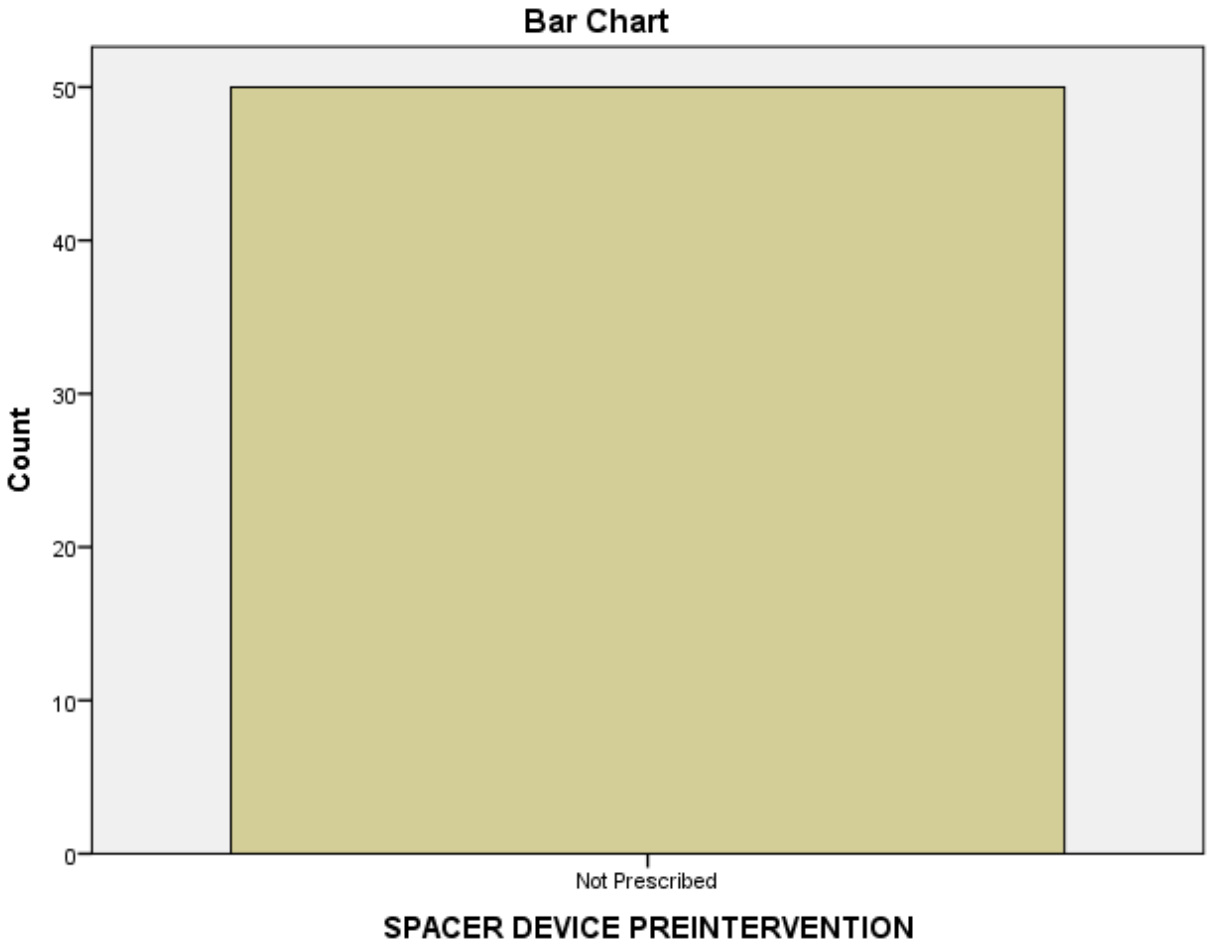
Appendix 14

Table 8

SPACER DEVICE PREINTERVENTION * SPACER DEVICE POST INTERVENTION Crosstabulation

Count

		SPACER DEVICE POST INTERVENTION	
		Prescribed	Total
SPACER DEVICE PREINTERVENTION	Not Prescribed	50	50
Total		50	50



Graph 8

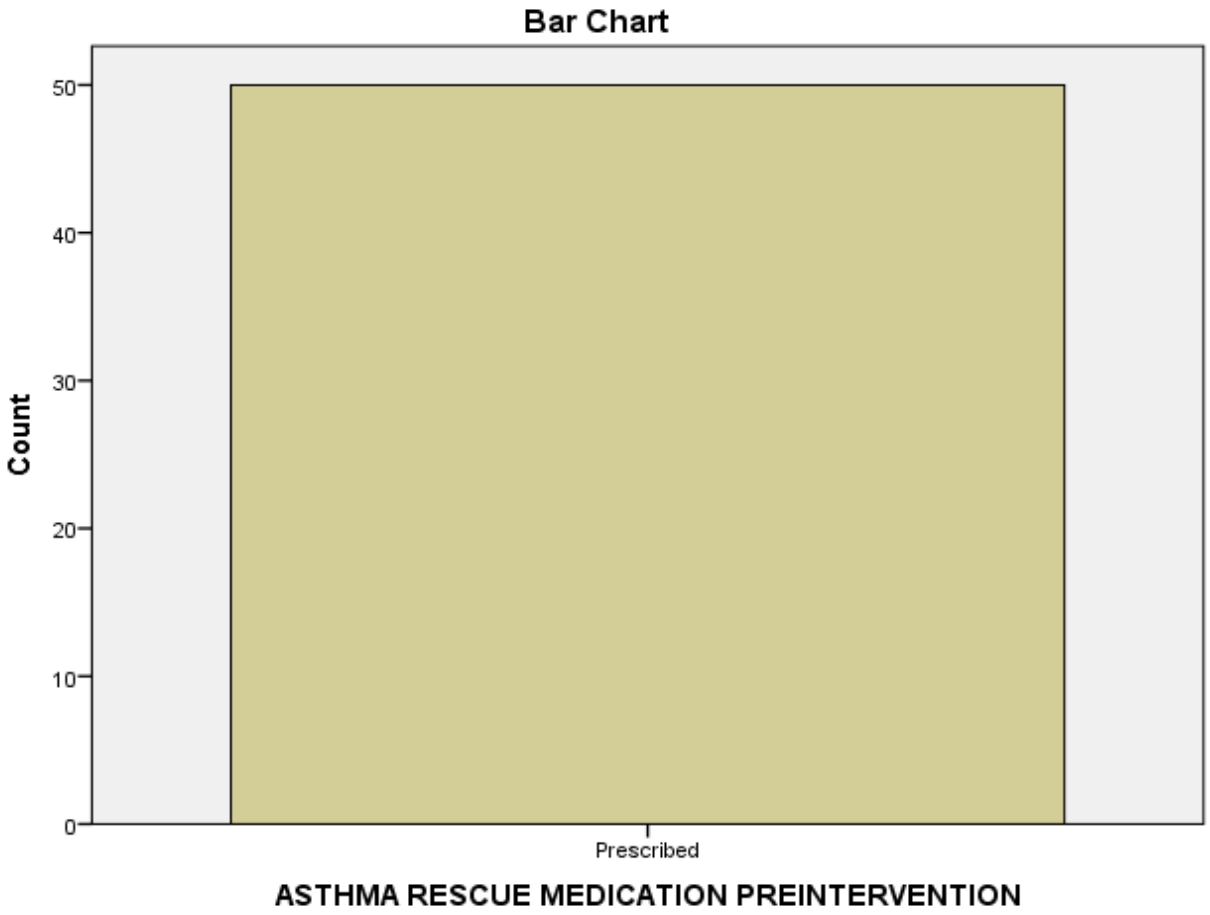
Appendix 15

Table 9

ASTHMA RESCUE MEDICATION PREINTERVENTION * ASTHMA RESCUE MEDICATION POST INTERVENTION Crosstabulation

Count

		ASTHMA RESCUE MEDICATION POST INTERVENTION	
		Prescribed	Total
ASTHMA RESCUE MEDICATION PREINTERVENTION	Prescribed	50	50
Total		50	50



Appendix 16

Table 10

GENDER * ACT SCORE POST INTERVENTION Crosstabulation

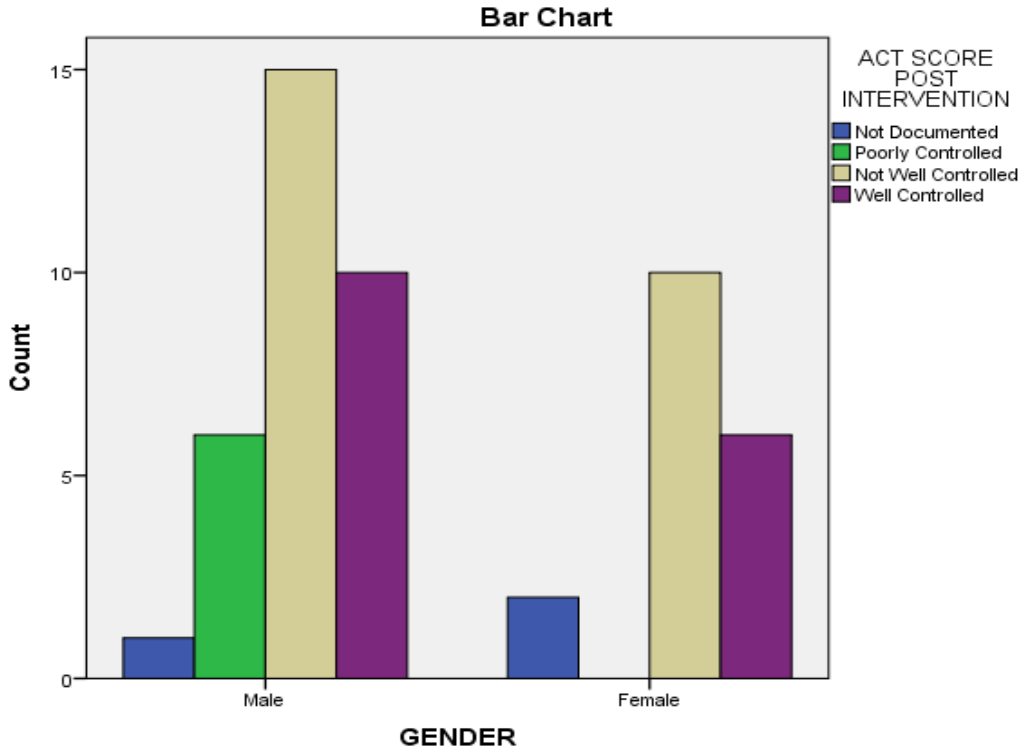
Count

		ACT SCORE POST INTERVENTION				
		Not Documented	Poorly Controlled	Not Well Controlled	Well Controlled	Total
GENDER	Male	1	6	15	10	32
	Female	2	0	10	6	18
Total		3	6	25	16	50

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.789[a]	3	.188
Likelihood Ratio	6.702	3	.082
Linear-by-Linear Association	.040	1	.842
N of Valid Cases	50		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is 1.08.



Graph 10

Appendix 17

Table 11

GENDER * ASTHMA SEVERITY POSTINTERVENTION Crosstabulation

Count

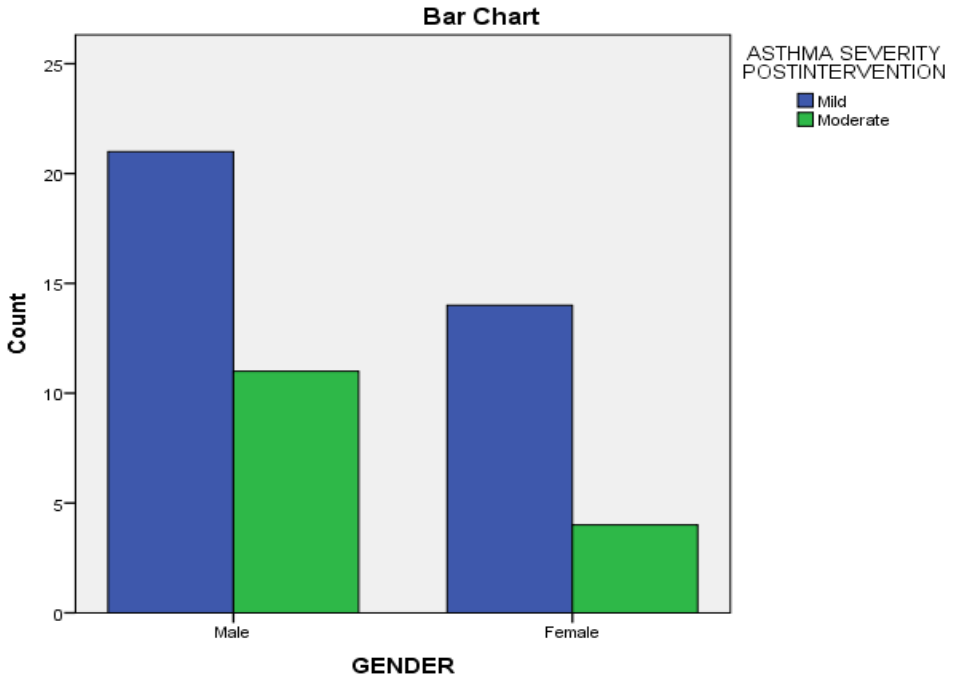
		ASTHMA SEVERITY POSTINTERVENTION		
		Mild	Moderate	Total
GENDER	Male	21	11	32
	Female	14	4	18
Total		35	15	50

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.810[a]	1	.368		
Continuity Correction[b]	.335	1	.563		
Likelihood Ratio	.834	1	.361		
Fisher's Exact Test				.523	.285
Linear-by-Linear Association	.794	1	.373		
N of Valid Cases	50				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.40.

b. Computed only for a 2x2 table



Graph 11