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Implementation of an Asthma Action Plan in a Pediatric Outpatient Clinic

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IMPLEMENTATION OF AN ASTHMA ACTION PLAN
IN A PEDIATRIC OUTPATIENT CLINIC

By

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A doctoral project submitted in partial fulfillment
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Doctor of Nursing Practice

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Doctoral Project Approval

The Graduate College
The University of Nevada, Las Vegas

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This doctoral project prepared by

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entitled

Implementation of an Asthma Action Plan in a Pediatric Outpatient Clinic

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Abstract

A combination of asthma evidence-based education by nurse practitioners and other healthcare providers as well as self-management by patients with asthma and their caregivers are necessary to provide effective asthma care. According to the National Asthma Education and Prevention Program (NAEPP) guidelines from the National Institute of Health (NIH), effective asthma care includes a detailed Asthma Action Plan (AAP). However, despite this evidence-based recommendation for all patients with asthma, studies suggest many healthcare providers do not routinely utilize an AAP.

The purpose of this Doctor of Nursing Practice (DNP) project was to develop and evaluate a process for the integration of an AAP into everyday practice for healthcare providers. The population of interest included pediatric healthcare providers who manage asthma for children ages 7 to 17 years and their caregivers.

The setting for this project was a small outpatient pediatric clinic in Las Vegas, Nevada. A simplified AAP was developed and pediatric healthcare providers were given the AAP to use with their patients with asthma to assess its ease-of-use and potential benefit to both the providers and patient. Over the course of six weeks, pre- and post-questionnaires were given to healthcare providers ($n = 4$) at the clinic. Descriptive analyses using frequencies and percentages were performed to tabulate responses on the questionnaires. Paired-samples *t*-tests were utilized from interval data to compare pre- and post-intervention responses (scores) on the questionnaires.

Results demonstrated overall improvement on the pre- and post-questionnaire scores. An improvement was also seen in the barriers of time used to apply the AAP and no accessible AAP templates. A post-intervention in-person interview provided suggestions for continued AAP use

including financial incentives, patient and caregiver empowerment, and AAP reminders for providers.

Evidence suggests that the NAEPP's recommendation for an AAP is effective.

Therefore, nurse practitioners and other healthcare providers may help reduce the morbidity and mortality associated with asthma in children by using an AAP. This DNP project demonstrated the ease of implementation of an AAP and may serve as an example for future quality improvement projects and research studies. By continuing to translate research evidence into everyday clinical practice, nurse practitioners and others involved in pediatric care may continue to improve practice by providing effective asthma management to children.

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Implementation of an Asthma Action Plan in a Pediatric Outpatient Clinic

Chapter I: Introduction

Asthma is a chronic health condition of the lungs that affects about seven million children in the United States (Simon & Akinbami, 2016). In the most recent report by the Nevada Statewide Asthma Coalition, as high as 16 percent of children in Nevada have asthma (DPBH, 2014). Childhood asthma is characterized by a recurrent cough, wheezing, and trouble breathing caused by inflammation and narrowing of the airways. Due to the smaller airways of children compared to adults, asthma can be more of a severe problem for this population. Asthma education by nurse practitioners and other healthcare providers as well as self-management by children and their families are essential to excellent asthma care (NAEPP, 2007).

Significance and Problem Statement

Due to developmental and physical variances, asthma in children manifests differently than in adults. Children with asthma have higher rates of office visits, emergency department visits, hospitalizations, and school absenteeism compared to asthmatic adults (Simon & Akinbami, 2016; Moonie, Seggev, Shan, Pergola, & Teramoto, 2015; CDC, 2017). Significant morbidity and mortality occur in children with asthma as well as greater utilization of healthcare services and resources (Chavasse & Kerr, 2016). Quality of life is also affected negatively by increased asthma severity in children (Cerdan, Alpert, Moonie, Cyrkiel, & Rue, 2012).

As of 2007, the National Asthma Education and Prevention Program (NAEPP) released Guidelines for the Diagnosis and Management of Asthma to assist healthcare providers in delivering high-quality asthma care. Within these guidelines, a written plan to help patients manage their asthma called an Asthma Action Plan (AAP) is recommended for both children and adults with asthma (NAEPP, 2007). Specifically, the AAP discusses avoidance of asthma

triggers, usage of asthma medication, awareness of worsening asthma indicators, and when to seek medical attention (Borgmeyer, Gyr, Ahmad, Ercole, & Balakas, 2016).

Despite the existence of the NAEPP guidelines which includes a detailed AAP, many healthcare providers are not proficient with using the AAP and do not offer an AAP when discussing asthma care with their patients (Borgmeyer et al., 2016; Ring et al., 2011). In a systematic review, Ring and colleagues (2011) highlight “a wide and persistent gap between recommended and actual practice” (p. e132) with several studies displaying underutilization of the AAP by healthcare providers as well as patients and caregivers. A practical method or process to incorporate the AAP into everyday asthma management as well as sustain it throughout the patient’s lifetime is lacking.

Purpose Statement

The purpose of this DNP project was to develop and evaluate a process for the integration of an AAP into everyday practice for healthcare providers. The project took place at a pediatric outpatient clinic and the population of interest included pediatric healthcare providers who manage asthma for affected children ages 7 to 17 years and their caregivers. As a result of this DNP project, an anticipated effect is that more healthcare providers, patients, and families should be cognizant of the AAP and feel empowered regarding asthma care.

Chapter II: Review of the Literature

The purpose of this literature review was to examine topics related to asthma care, asthma action plans, and healthcare provider asthma education to patients. Covering a period of 10 years ranging from 2008 to 2018, the sources used to retrieve the documents for this literature review include the University of Nevada, Las Vegas (UNLV)-subscribed databases Medline and CINAHL. The following words, both individually and together, were typed into search engines: asthma, child, pediatric, asthma action plan (AAP). Inclusion criteria to the literature review included peer-reviewed, empirical studies dating from 2008 which addressed asthma education through the form of an Asthma Action Plan (AAP) or written asthma action plan (WAAP) by healthcare providers to children with asthma and their families within an office or hospital setting. Exclusion criteria included letters to the editor, policy statements, program statements, non-empirical studies, studies written in a foreign language, and those involving AAPs in a school setting. Though the search yielded two-hundred results, only thirty-six publications met the criteria for this literature review.

Asthma Action Plan Utilization and Perceived Barriers

An AAP developed and demonstrated by the healthcare provider allows asthmatic patients and their families to be in more complete control of their asthma through self-management. In addition to high-quality asthma care, AAPs have shown to result in better outcomes for patients in the areas of physical, mental, and emotional health (Simon & Akinbami, 2016). Benefits to having an AAP include fewer asthma visits to healthcare providers' offices and emergency departments, fewer nighttime symptoms, fewer days missed at school, and better overall asthma symptom scores including quality of life (Gillette et al., 2013). Despite the NAEPP guidelines stating a detailed AAP is necessary for all patients, many studies discuss the

fact that many healthcare providers do not follow this recommendation (Borgmeyer et al., 2016; Ring et al., 2011). Common barriers to usage include the perception of not enough time and the AAP not being valuable, forgetfulness due to the AAP not being routinely discussed, no accessible AAP templates, and no monetary compensation by insurance companies (Djandji et al., 2017).

Interestingly, the study by Simon and Akinbami (2016) showed that from 2002 to 2013, only 50% of children received an AAP and that sociodemographic status and asthma severity played a role in whether an AAP was provided or not. Those who were non-Hispanic black, those with greater asthma severity who took inhaled preventative medication daily, and those with private insurance were more likely to receive an AAP (Simon & Akinbami, 2016). In the study by Djandji and colleagues (2017), situations in which patients were more likely to receive an AAP were when patients requested one, a blank copy was placed in patients' medical charts before the office visit, and when a specialist had previously completed a patient's AAP (Djandji et al., 2017). Gillette and colleagues (2013) showed in their study that about 21% of the time, an AAP was written by a healthcare provider to the child and their family especially if the child was enrolled in Medicaid, if the visit was on asthma and took longer, and the healthcare provider was not White and had more education (Gillette et al., 2013).

Low-Literacy Asthma Action Plans

Although AAPs are recommended for all patients with asthma, recent studies have demonstrated that AAPs might be too complex for healthcare providers to explain as well as for low-literacy patients to understand (Yin et al., 2016). Even more difficult is that aside from the healthcare provider having to discuss the AAP, they must also explain asthma medication, correct use of inhaler devices, and recognizing symptoms of asthma flare-ups within a limited

time-frame during the patient visit. In contrast to most AAPs which are meant for those who can read above a sixth-grade level, using a low-literacy, photograph-based AAP would provide greater understanding and subsequent compliance of asthma care (Yin et al., 2016). For example, parents of asthmatic children who used a low-literacy AAP established a better understanding of asthma management (Yin et al., 2017). In addition to educational interventions, another area of emphasis is the behavior of the healthcare provider including communication and teaching style that can increase patient compliance with their AAP (Duncan et al., 2017).

Yin and colleagues (2016) found that a low-literacy AAP allowed open communication between the healthcare provider and patient as well as more time to discuss specific medication instructions and when to seek medical attention. Duncan and colleagues (2017) showed that low-literacy, pictorial AAPs were well-received by both healthcare providers and patients. Specifically, they liked the cartoon-like pictures with words and short phrases as well as standard stoplight format which is universally recognized (Duncan et al., 2017). Lakupoch and colleagues (2017) created a simplified, user-friendly AAP in Thai which showed among participants significantly less emergency room visits, unscheduled healthcare provider visits, hospital admission days, and days missed at school (Lakupoch, Manuyakorn, Preutthipan, & Kamalaporn, 2017). In a study comparing the rate of an AAP used by Spanish-speaking, limited English-proficiency caregivers to English-proficient caregivers seeking medical care for their children's asthma demonstrated significantly lower usage of AAPs by the former group (Riera, Navas-Nazario, Shabanova, & Vaca, 2014).

Asthma Action Plans in Electronic Form

An innovative movement has begun to incorporate the AAP into electronic form whether that is through electronic health records, mobile phones, or other types of technology. Though the NAEPP recommends a written AAP, paper AAPs may not be relevant to many individuals today including teenagers of whom 80% have a mobile device with three-fourths accessing the Internet through their phone (Burbank et al., 2015). By utilizing technology to address the NAEPP guidelines to healthcare providers and incorporating it into patient care, that increases the chances that patients will receive an AAP and be more involved in self-management of their asthma (Kuhn et al., 2015). Specifically, for children, having an AAP has shown a reduction in hospital admissions, school absences, and the use of rescue inhalers (O'Leary et al., 2016).

Burbank and colleagues (2015) demonstrated high satisfaction by teenagers using their mobile AAP and 93% were able to better control their asthma. Having uncontrolled asthma at baseline, Asthma Control Test (ACT) scores significantly increased from 16 to 18 while median scores of asthma attack prevention self-efficacy increased from 34 to 36 (Burbank et al., 2015). Kuhn and colleagues (2015) showed significantly less pediatric asthma exacerbations including 33% less use of oral steroids when utilizing technology to assist patients in asthma self-management (Kuhn et al., 2015). In contrast to other studies displaying the benefits of electronic AAPs, the study by Perry and colleagues (2017) showed that the group assigned to a paper AAP had a significantly higher diary completion rate as opposed to those in the smartphone AAP group (Perry et al., 2017).

Effectiveness of Asthma Action Plans

Studies show that asthma patients who have an AAP in combination with asthma education increase their health outcomes significantly (Tan, Chen, Soo, Ngoh, & Tai, 2013).

Examples of these positive health outcomes include a 27% decreased risk in asthma exacerbations, a 40% decrease in hospitalizations, and a 40% decrease in emergency department visits (Wagner & Steefel, 2017). Important concepts to an asthmatic patient's self-management include having an AAP, having prior asthma education and routine medical visits, and compliance with medication especially a daily controller. The inability of asthmatic patients to take care of themselves can be attributed to healthcare providers not being familiar with the asthma guidelines and not offering an AAP to patients (Ducharme et al., 2010).

Many studies demonstrate that having an AAP would benefit both healthcare providers and their patients. Ducharme and colleagues (2010) showed an association between the healthcare provider presenting an AAP and recommending a daily inhaled steroid. Additionally, patients with an AAP were more likely to fill their daily inhaled steroid prescription, use it as directed, and return for follow-up (Ducharme et al., 2010). In the study by Tan and colleagues (2013), caregivers with asthmatic children who were given AAPs were more likely to comprehend the pathophysiology of asthma to feel capable, safe, and confident.

Although an AAP is recommended by the NAEPP guidelines, not all studies agree that an AAP alone benefits healthcare providers and patients. By contrast, some researchers found no significant difference in outcomes existed for those with an AAP and those without one. Asthma control based on symptoms, quality of life scores, and usage of healthcare services did not change (Sunshine, Song, & Krieger, 2011). Sheares and colleagues (2015) found that having an AAP distributed by pulmonologists and allergists was not significantly associated with less asthmatic symptoms, nighttime symptoms, or rescue inhaler use (Sheares et al., 2015). In the study by Khan and colleagues (2014), children with an AAP had fewer, but not significant ER

visits, asthma attacks, school absences nocturnal symptoms and sick visits at the healthcare office than those who did not have an AAP (Khan, Maharaj, Seerattan, & Babwah, 2014).

Needs Assessment

A needs assessment is intended to determine the current status of a situation and the need, if any, for change. The literature, described above, presents the pros and cons of implementing AAPs; however, most of the literature indicates that AAPs, while necessary and recommended by the NAEPP, are not being used for a variety of reasons. Based on the need for AAPs described in the literature and the empirical observation of this DNP project's author, it is believed that this project was of value and needed. Stakeholders who would be positively impacted by this project include pediatric healthcare providers, employees working with the pediatric healthcare providers, asthmatic children and their caregivers, and other members of the healthcare community including those involved in clinics, hospitals, healthcare organizations, and health insurance companies.

Chapter III: Theoretical Underpinning

The conceptual framework used for this project was Lewin's Theory of Planned Change (Wojciechowski, Pearsall, Murphy, & French, 2016). Lewin's theory is used to explain how individuals or organizations respond and adapt to changes in their environments. Lewin (1951) explains that individuals are influenced by the tension of restraining and driving forces which together, ultimately create an equilibrium or maintain the status quo. To change a current situation, three steps of unfreezing, changing, and refreezing are necessary. Unfreezing involves assessing for any individual or organizational problems and then challenging the current situation. Changing involves seeking solutions via brainstorming, coaching, training, and other methods. Refreezing involves the integration of the new status quo and making it a habit within a group of individuals or within the organization (Lewin, 1951; Wojciechowski et al., 2016).

Applying this to the DNP project, the first stage of this theory, unfreezing, involved a change agent or nurse leader recognizing a need for change and mobilizing others to perceive this problem. After an extensive literature review and taking notes as a pediatric nurse practitioner, one observation made was the absence of a standard AAP in most pediatrician's offices (Shirey, 2013). Despite the existence of the NAEPP guidelines which includes a detailed AAP, many healthcare providers are not proficient with using the AAP and do not offer an AAP when discussing asthma care with their patients (Borgmeyer et al., 2016; Ring et al., 2011). In a systematic review, Ring and colleagues (2011) highlight "a wide and persistent gap between recommended and actual practice" (p. e132) with several studies demonstrating the underutilization of the AAP by healthcare providers as well as patients and caregivers. Highly needed was a practical method or process to incorporate the AAP into everyday asthma management as well as sustain it throughout the patient's lifetime.

The second stage, moving or transitioning, involved selecting a solution by creating a detailed action plan and engaging others to participate in the change (Shirey, 2013). Based on the guidelines provided by the NAEPP, an AAP is recommended for both children and adults with asthma to both empower and encourage patients to self-manage their asthma and reduce their risk of morbidity and mortality related to their diagnosis. By working together and creating an AAP, the healthcare provider and asthmatic patient develop a partnership and a tool that emphasizes long-term asthma control, environmental control measures, asthma medication usage, worsening asthma signs and symptoms, and when to seek medical care. Since education is a key recommendation at every asthma-related visit, combining a one-page AAP in either paper or electronic medical record form would be a straightforward and efficient procedure. Once in a patient's records, it can be revised and reviewed for any future visits (NAEPP, 2007).

The third stage, refreezing, stabilized the change so that it becomes incorporated into organizational culture, policies, and practices (Shirey, 2013). After educating the healthcare provider and any clinic staff on using the AAP as well as choosing an AAP template for the clinic, the change started immediately. After the AAP is created in partnership between the healthcare provider and patient, follow-up appointments were made as recommended by the NAEPP guidelines to encourage reinforcement (NAEPP, 2007). To measure the usefulness of implementing the AAPs, some methods of evaluation before and after AAP application included measuring the patient's quality of life, asthma signs and symptoms, the frequency of medication usage, and the patient report of using the AAP. This can be in paper, electronic, or mobile phone form. Based on study findings, the motivating factor in keeping an AAP for both the healthcare provider and patient is reduced asthma morbidity and mortality (NAEPP, 2007).

Chapter IV: The Project

The stated purpose of this DNP project was to develop and evaluate a process for the integration of an AAP into everyday practice for healthcare providers. This chapter details the quality improvement initiative implemented to achieve this purpose.

Setting, Design, Population, and Sample

This project utilized a pre-post interventional design. The setting was an outpatient pediatric clinic in Las Vegas, Nevada. The population of interest included pediatric healthcare providers who were treating children with asthma ages 7 to 17 and their caregivers; the specific sample of this quality improvement project included the providers at the clinic. There are four providers including two pediatricians, one pediatric nurse practitioner, and one physician assistant at the clinic where the project was implemented.

The rationale for targeting patients with asthma ages 7 to 17 was due to the ease of asthma diagnosis since for this age range NAEPP guidelines for testing such as spirometry and peak flow meters are the same as adults (NAEPP, 2007). Developmentally, children at this age can read and participate along with their caregivers in reviewing and utilizing their AAP. For example, children are capable of explaining their symptoms to their caregiver who can then make decisions based on their AAP.

Project Timeline

Asthma is a common diagnosis and a reason for frequent visits to outpatient pediatric clinics; therefore a timeline of six weeks was decided as necessary to educate the providers and staff regarding the AAPs, implement the AAP, and evaluate the intended outcomes among the providers. Appendix A displays a more detailed project timeline. Following approval by the

DNP project committee, the project was submitted to the Institutional Review Board and was deemed as 'excluded'. A copy of the exclusion letter is in Appendix B.

Procedures

A simplified English and Spanish version of an AAP, congruent with the NAEPP guidelines, was developed for the intervention by the author of this DNP project (NAEPP, 2007). The AAP is discussed later in this chapter and can be viewed in its entirety in both Appendices C and D. Data were gathered prior to the intervention utilizing a questionnaire which the providers completed. The questionnaire consisted of seven questions which addressed the importance of an AAP, its actual usage, and possible barriers to utilization. Appendix E presents the entire pre-intervention questionnaire.

The intervention began with delivering education and the AAP template to the providers. This DNP project's author, also a provider at the clinic, delivered the education and spent approximately 10 minutes discussing the AAP and answering any questions. The NAEPP guidelines, used as part of the education, explain in detail that an AAP is meant to be easy to use by both the healthcare provider as well as asthmatic patients and their caregivers (NAEPP, 2007). Following the education session, the providers were then able to immediately start using the AAP for their patients with asthma and respective caregivers.

During weeks one and two, the providers were asked to take note of their usage of the AAP, as well as general observations of asthma severity, medication use, and the education needs of their patients and their caregivers. During this time period, the goal of the providers was to see five patients each or 20 patients total by the end of the intervention period. Follow-up appointments were scheduled within two to three weeks at the clinic. Per the NAEPP guidelines,

asthma follow-up for assessing and monitoring asthma care is usually recommended between two to six weeks (NAEPP, 2007).

The AAP addressed all the key points to asthma education for the patient including avoidance of asthma triggers, usage of asthma medication, awareness of worsening asthma indicators, and when to seek medical attention (Borgmeyer et al., 2016). The AAP served as a streamlined asthma education outline for the providers while patients used it as a beneficial guide for self-management of their asthma (NAEPP, 2007).

During weeks three to five, as the providers saw their patients with asthma and their caregivers at follow-up visits, the providers again took note of their usage of the AAP as well as a general observation of asthma severity, medication use, and education needs. On the sixth week, the providers completed a post-intervention questionnaire which included 14 questions addressing satisfaction, AAP utilization, importance and continued usage of AAP, barriers to the AAP, and change in asthma status. Appendix F contains the entire post-intervention questionnaire.

Since the focus of this DNP project was on the providers rather than asthmatic patients and their families, any data identifying a patient was not documented. Each of the 20 AAPs was marked with a number from one to 20 to allow the providers to keep track of patients during their follow-up visits. The reason the providers were targeting five patients each is that at the clinic, each provider sees approximately one to two asthmatic patients per week. The timeframe of six weeks gave the providers adequate time to examine the asthmatic patient, give them an AAP, and re-examine them at a follow-up appointment.

Copies of the AAP were placed within arm's reach in an asthma folder (the clinic uses paper charting) as a reminder to the provider to use the AAP. At the conclusion of the project's

timeframe, each provider was interviewed in person and asked, “What would make you continue to use the AAP in the future?”

Resources. In implementing this DNP project, few resources and support were required because the structure, setting, and individuals were already in place to be able to provide patients with an AAP. Since most of the healthcare setup such as settings and structure currently exist, the financial costs for planning and implementation were considered low in comparison to the possible gain of lower healthcare costs related to asthma morbidity and mortality.

Marketing. The marketing plan included advertising the project through word-of-mouth and e-mails to the providers who work at the clinic. Also, creating a poster campaign to encourage AAP acceptance and habitual usage was beneficial for marketing. This project was financially neutral to the clinic as there was no direct monetary benefit or compensation as a result of reimbursement of health insurance companies. Additionally, since the AAP usage is explained in detail in the NAEPP guidelines, no financial costs were associated with AAP staff training as well as incorporating the AAP into the patient's medical records.

Aside from financial costs, the initial implementation of the project including the providers' learning to use the AAP and then subsequently using it routinely did cost some clinical time. Although no monetary benefits existed for this project, there was an initial investment of some valuable time perceived by the providers to begin and maintain usage of the AAP.

Instruments and templates. As noted above, the AAP template that this project's author developed was based on the NAEPP guidelines (NAEPP, 2007). The AAP template was printed in both English and Spanish. This AAP was meant to be simple to use and easy to read

especially at a lower reading level, and visually appealing to the user. The AAP templates are presented in both Appendices C and D.

Data analysis: Evaluation of outcomes. Pre- and post-intervention responses from the questionnaire were analyzed as outcomes. Ordinal level (ranked) items on the questionnaires were converted to interval level data and were reported as scores. Descriptive statistics were utilized to report results generally as a mean. Paired-samples *t*-tests were utilized for questions 1 through 4 to determine any possible statistical pre- and post-intervention difference in scores.

This project was intended to be a pilot for implementing evidence-based practice through the introduction of an AAP in a small-group setting. Additionally, an easy-to-use, low-cost AAP template was developed to promote sustainability with the process of utilizing an AAP into daily practice for the providers.

Risks, limitations, and threats. Risks, limitations, and threats were anticipated and included utilizing excess patient appointment time and slowing down the flow of the outpatient pediatric clinic due to time constraints. Barriers to using the AAP included the perception of not enough time and the AAP not being valuable, forgetfulness due to the AAP not being routinely discussed, no accessible AAP templates, and no monetary compensation by insurance companies (Djandji et al., 2017). Other barriers included the provider and ultimately, the patient not desiring to use the AAP.

To overcome common barriers to using the AAP and encourage healthcare providers to most likely use the AAP, several actions were executed. First, the providers were thoroughly educated regarding the purpose and ease of use of the AAP as well as given a copy of an AAP template. Second, to remind providers to use the AAP, copies of the AAP were placed within arm's reach in an asthma folder since the office used paper charting. Third, once using the AAP

became a habit, its usage as well as referring to it during follow-up visits would add to the efficiency of the appointment times. Unfortunately, subsequent to interventions, patients eventually may still refuse to use the AAP. However, the AAP can continue to be routinely brought up to patients at subsequent asthma visits by the providers.

Sustainability. This project was easy to maintain due to zero to low costs, the simplicity of use of the AAP once learned, and potential long-term health benefits and cost-savings to both the healthcare provider and patient. However, initial start-up of the project including learning to use the AAP and creating a habit of routinely using the AAP in practice consumed valuable time perceived by the providers as well as this DNP project's author who was the designated educator. Though financial costs may be zero to low, there was a preliminary investment of time commitment to adapt and continue to use the project at the outpatient pediatric clinic.

Summary

The quality improvement project described in this chapter was completed to achieve the stated purpose of this DNP project, which was to develop and evaluate a process for the integration of an AAP into everyday practice for healthcare providers. In summary, providers were queried before and after education and implementation of AAPs to determine if any change in practice occurred.

Chapter V: Results/Outcomes

This chapter presents the results and outcomes of this DNP project. Scores from the questionnaires used in this project, barriers to AAP use, and recommendations from the participating healthcare providers are presented. Discussion of the results is presented in the subsequent chapter.

Outcomes for this DNP project are related to the responses on pre- and post-intervention questionnaires. The pre-intervention questionnaire consisted of seven questions and the post-intervention questionnaire consisted of 14 questions (see Appendices E and F). Seven questions were the same on both questionnaires. The post-intervention questionnaire contained additional questions regarding provider and patient satisfaction, continued use of AAP, and change in asthma status post-implementation of the AAP. The responses for both questionnaires for questions 1 through 4 utilized Likert scales ranking responses from one to five; A rating of one meant none, not likely, or not important while five indicated all the time, very important, or very likely. The ratings (ordinal level data) were converted to scores (interval level data) to allow for averaging and reporting of results as scores.

Other questions required the providers to fill in the blanks regarding general questions about their patients in percentages. Generally, an improvement was noted for most post-intervention scores compared to pre-intervention (questions 1 through 4). No statistical differences were found with any pre-post comparisons utilizing a paired *t*-test ($p>0.05$). However, none was expected given the small sample size. Lastly, an in-person interview was conducted in response to the question “What would make you continue to use the AAP in the future?”

Questions and Scores: Pre-and Post-Intervention

Question 1 inquired how often the providers were using an AAP. Results indicated a pre-intervention score of 2.25 and a post-intervention score of 3.50 which indicated improvement.

Question 2 asked the providers to rate the importance of an AAP for themselves as a provider. The pre-intervention score was 4.25 and a post-intervention score was 4.50.

Question 3 examined the importance of an AAP for patients. The pre-intervention score was 4.50 and was unchanged at post-intervention.

Question 4 queried how likely the providers were to recommend an AAP to patients. Scores pre-intervention averaged 2.75 and the post-questionnaire score was 4.00.

Question 7 demonstrated that half of the providers were giving out AAPs to patients before the intervention while post-intervention, all the providers were offering AAPs to patients. Appendices G and H display a table and graphical depiction of the above scores.

Additional Post-Intervention Results

Question 8 indicated that three out of four providers were very satisfied overall using their AAP. A mean score of 4.75 was demonstrated.

Question 9 asked the providers their perception of their patients' and caregivers' satisfaction with the AAP. Half of the providers felt their patients and caregivers were satisfied using their AAP. A mean score of 3.50 was calculated.

When asked in question 10 how likely the providers see themselves continuing to use an AAP, three of the four providers were likely to continue to use the AAP. Their average score was 3.50.

Responses to question 11 indicated that all four providers felt their patients were somewhat likely to continue using an AAP. The average score was 3.25.

Regarding question 12, all four providers saw some improvement in asthma signs and symptoms with a calculated average score of 3.00.

Question 13 asked the provider to rate the correct use of medication(s) by their patients; half of the providers noted that patients were correctly using their medication(s) most of the time (a score of 3.75).

Question 14 addressed the level of asthma control. Three of the providers indicated determined their patients' asthma was mostly under control. Results indicate an average score of 3.75. Appendices G and H display a table and graphical depiction of the above scores.

Categories of Asthma Severity

During the last month of the project, various categories of asthma severity were observed by the providers. On the pre-intervention questionnaire, about 64.4% of patients were categorized as mild intermittent, 21.8% mild persistent, 9.9% moderate persistent, and 4.8% severe persistent. In the post-questionnaire, few changes were noted with 62.5% of patients categorized to have mild intermittent, 17.3% mild persistent, 12.5% moderate persistent, and 7.7% severe persistent asthma. Appendix I displays asthma severity graphically.

Reported Barriers

On the pre-intervention questionnaire, all four providers (100%) stated that barriers to using the AAP in practice included time used to apply it and remembering to use it. One provider (25%) did not use an AAP and three providers (75%) had no accessible AAP templates. On the post-intervention questionnaire, barriers after using the AAP in practice included time used to apply it (50%), remembering to use it (100%), and no monetary compensation (25%).

Comparing both the pre- and post-intervention questionnaire, an improvement was seen in the barriers of time used to apply the AAP and no accessible AAP templates. Appendix J contains a graph of AAP barriers.

Provider Recommendations

Several recommendations were given in response to “What would make you continue to use the AAP in the future?” During this in-person interview question, one provider recommended insurance reimbursement as a financial incentive for using AAPs. Another provider stated that since AAPs were difficult for providers in general to remember, it was recommended that patients become more empowered in their asthma care and ask their providers about an AAP during their visit. Asthmatic patients can be informed about an AAP through a national asthma campaign or various media advertising such as through television or social media. The third and fourth providers also agreed that AAPs were difficult to remember and that having the AAP and asthma resources within arm’s reach in a special folder would be useful. Continuing education that includes material specific to asthma for recertification would be helpful to remember NAEPP asthma guidelines including AAP usage.

Summary

This DNP project’s results demonstrated general improvement at the post-intervention measurement time point. Barriers to the use of an AAP, primarily time and accessibility were also noted. Lastly, recommendations from providers obtained from an in-person interview provided some insight for continued AAP use.

Chapter VI: Discussion

Presented in this chapter is a discussion of how this project was similar and different from previously reported studies as well as congruency with Lewin's Theory of Planned Change. Giving meaning to the project itself, the results, and the limitations of the project are also discussed.

Synopsis of the Phenomena of Interest

Several studies have demonstrated how utilizing AAPs in asthma patients can contribute to a decrease in overall morbidity and mortality (Tan et al., 2013; Wagner & Steefel, 2017; Ducharme et al., 2010). Supporting evidence-based practice, this quality improvement project executed the introduction of a simple AAP to a small-group setting. Though this project promoted the advancement of nursing practice and concurred with both the literature review and Lewin's Theory of Planned Change, it is not without its limitations.

Despite NAEPP recommendations and several studies indicating the benefits of using AAPs, this DNP project addressed the problem identified which was that providers failed to utilize AAPs for their asthma patients. By creating an easy-to-use AAP in both English and Spanish and providing education on its use and benefits, this DNP project's author was able to translate evidence into practice by encouraging fellow providers to appreciate the use and importance of an AAP. Once introduced into the healthcare setting, delivering the AAPs appears empirically to have become habitual practice. Results further demonstrated overall satisfaction of the healthcare providers in utilizing the AAP, their desire to continue its usage in practice, and perceived benefits to asthma patients.

Giving Meaning to the Project

The results of this DNP project coincided with both the literature review and Lewin's Theory of Planned Change. Despite the NAEPP guidelines stating a detailed AAP is necessary for all patients, many studies discuss the fact that many healthcare providers do not follow this recommendation (Borgmeyer et al., 2016; Ring et al., 2011). Only half of the healthcare providers at the clinic where the project was implemented sometimes used AAPs due to commonly perceived barriers such as having time to use it and remembering to use it. Duncan and colleagues (2017) showed that low-literacy, pictorial AAPs were well-received by both healthcare providers and patients. In response to studies demonstrating low-literacy AAPs being more effective, the author of this DNP project created her own straightforward AAP with short phrases and cartoon-like images (Duncan et al., 2017).

By utilizing technology to address the NAEPP guidelines to healthcare providers and incorporating it into patient care, that increases the chances that patients will receive an AAP and be more involved in self-management of their asthma (Kuhn et al., 2015). Unfortunately, the clinic utilized in this project employs paper charting so this author was not able to implement the NAEPP in electronic form through electronic medical records (EMRs), cell phone applications, text messages, or other electronic means at this time. Several studies demonstrated that those with an AAP in combination with education increased their medication compliance and their health outcomes significantly (Tan et al., 2013; Ducharme et al., 2010). After implementation of the AAP, outcomes observed were that the healthcare providers saw an improvement in asthma signs and symptoms, felt their patients' asthma were mostly under control, and that patients were using their medication most of the time.

Applying Lewin's Theory of Planned Change (1951), this DNP project explained the change among healthcare providers at this pediatrician's office through opposing forces that ultimately create or maintain the status quo. During the first stage, unfreezing, this DNP project's author recognized a need for change and mobilized other healthcare providers to perceive this problem which was the lack of utilization of AAPs. The second stage, moving or transitioning, involved selecting the solution of implementing an AAP engaging the healthcare providers to participate in the change. The third stage, refreezing, stabilized the change so that it becomes incorporated into the culture, policies, and practices at the clinic where this project was implemented (Shirey, 2013). Overall, the change was considered a success.

Strengths and Limitations

Strengths to this DNP project include the translation of evidence into practice by the creation of a simplified AAP which utilized the NAEPP recommendations and addressing the barriers to implementation as identified in previous research. Additionally, the pre- and post-questionnaires were filled out promptly which reduced the risk of recall error and improved the accuracy of reporting data.

Limitations to this project included being unable to objectively measure patients' actual asthma outcomes and a lack of generalizability to the population. Because of this project's focus on healthcare providers rather than asthma patients, specific patient data such as asthma severity, medication use, and signs and symptoms were not collected for analysis. The sample size admittedly was small which decreased the power of this project and selection bias was also a factor since all healthcare providers at the clinic were more willing to participate in this project. Despite the limitations, this demonstrated another step in the direction of improving nursing practice by bridging a connection between research and practice.

Potential for Sustainability

This project was easy to maintain due to zero to low costs, the simplicity of use of the AAP once learned, and potential long-term health benefits and cost-savings to both the healthcare provider and patient. However, initial start-up of the project including learning to use the AAP and creating a habit of routinely using the AAP in practice consumed valuable time of the healthcare providers as well as the designated healthcare educator. Though financial costs may be zero to low, there was a preliminary investment of time commitment to adapt and continue to use the project at the outpatient pediatric clinic.

Utilization and Dissemination of the Results

By following NAEPP's evidence-based guidelines which include an application of an AAP, nurse practitioners and other healthcare providers may help drastically reduce the morbidity and mortality associated with asthma in children. Routine utilization of an AAP translates into potentially less office and emergency department visits, hospitalizations, and school absenteeism as well as better quality of life which extends into adulthood (Simon & Akinbami, 2016; Moonie et al., 2015; Chavasse & Kerr, 2016; Cerdan et al., 2012). Asthma education by nurse practitioners and other healthcare providers as well as self-management by children and their families are essential to excellent asthma care (NAEPP, 2007). At the pediatric clinic where the DNP project took place, AAPs were not continued post-intervention due to clinic-specific changes needed but will be restarted in the next six months after a detailed clinic protocol is written by the DNP project author.

Future and Scholarly Activity Resulting from This Project

This DNP project provides an initial plan to be utilized on a greater scale such as larger pediatrician's offices, within the city or state, or even nationally. With a larger sample size and

increased statistical power, further quality improvement projects and research studies can evaluate various approaches to implementing AAP including learning and teaching styles, electronic delivery methods, and techniques to encourage follow-up with asthma patients. Stakeholders such patients, insurers, and clinic owners may appreciate knowing that, as shown during implementation, this project requires a minimal initial investment since costs are low, AAP templates are readily available, and most healthcare facilities have all the necessary resources.

Plan for Dissemination of Results

The purpose of dissemination for this DNP project is to create awareness of the AAP as well as the importance of asthma education and self-management to nurse practitioners and healthcare providers who provide care and management of asthma patients. Results will be disseminated to the healthcare population of Las Vegas using several methods including sharing the information from this DNP project via publishing this project in nursing and health periodicals, creating poster or presentations at health conferences, and visiting individual pediatrician's offices over a lunch conference to present findings of this project. The dissemination of this project's results is anticipated to take one to two years. In collaboration with the other healthcare providers at the clinic where this project was implemented and the local health department, an asthma awareness campaign could be initiated that utilizes social media to motivate patients and families to ask their healthcare providers about AAPs during their next visit.

Conclusion

The purpose of this DNP project was to develop and evaluate a process for the integration of an AAP into everyday practice for healthcare providers. Taking place at a pediatric outpatient

clinic, the population of interest included pediatric healthcare providers who manage asthma for affected children ages 7 to 17 years and their caregivers. By creating an easy-to-use AAP in both English and Spanish and providing education on its use and benefits, this DNP project's author utilized evidence-based practice by encouraging fellow providers at a pediatric clinic to appreciate the use and importance of an AAP. Once introduced into the healthcare setting, delivering the AAPs appear to have become habitual.

After implementation, results showed general satisfaction and advantages from utilizing the AAP with asthma patients and improvement in scores related to use of an AAP. This introductory project on implementing AAPs may serve as a pilot for future quality improvement projects and research studies. By continuing to translate research evidence into everyday clinical practice, nurse practitioners and other healthcare providers may continue to maintain their path to providing effective asthma care and management.

Appendix A: Detailed Weekly Project Timeline

Week	Intervention
1	<ol style="list-style-type: none"> 1. Healthcare providers at the clinic were contacted by the DNP project's author and asked to participate 2. The pre-intervention questionnaire was given to all healthcare providers to complete. 3. Copies of the AAP template were given out. 4. Use of the AAP started immediately at the outpatient pediatric clinic 5. Healthcare providers took note of their usage of the AAP as well as general observation of asthma severity, medication use, and education needs of the asthmatic patients and caregivers they encountered. 6. It was anticipated that each healthcare provider would see at least five asthmatic patients each. 7. Follow-up appointments were scheduled within two to three weeks.
2	<ol style="list-style-type: none"> 1. Healthcare providers took note of their usage of the AAP as well as general observation of asthma severity, medication use, and education needs of the asthmatic patients and caregivers they encountered. 2. The goal of the healthcare providers was to see at least five asthmatic patients each. 3. Follow-up appointments were scheduled within two to three weeks.
3	<ol style="list-style-type: none"> 1. Healthcare providers saw their patients with asthma and their caregivers during their follow-up visits. 2. Healthcare providers again took note of their usage of the AAP as well as general observation of asthma severity, medication use, and education needs.
4	<ol style="list-style-type: none"> 1. Healthcare providers saw their patients with asthma and their caregivers during their follow-up visits. 2. Healthcare providers again took note of their usage of the AAP as well as general observation of asthma severity, medication use, and education needs.
5	<ol style="list-style-type: none"> 1. Healthcare providers saw their patients with asthma and their caregivers during their follow-up visits. 2. Healthcare providers again took note of their usage of the AAP as well as general observation of asthma severity, medication use, and education needs.
6	<ol style="list-style-type: none"> 1. The post-intervention questionnaire was completed by all healthcare providers. 2. Questionnaires were evaluated using primarily descriptive statistics.

Appendix B: IRB Exempt Status



**UNLV Biomedical IRB - Exempt Review
Exempt Notice**

DATE: May 30, 2018

TO: Mary Bondmass, PhD
FROM: Office of Research Integrity - Human Subjects

PROTOCOL TITLE: [1238236-1] Implementation of an Asthma Action Plan In a Pediatric Outpatient Clinic

ACTION: DETERMINATION OF EXEMPT STATUS
EXEMPT DATE: May 30, 2018
REVIEW CATEGORY: Exemption category # 3

Thank you for your submission of New Project materials for this protocol. This memorandum is notification that the protocol referenced above has been reviewed as indicated in Federal regulatory statutes 45CFR46.101(b) and deemed exempt.

We will retain a copy of this correspondence with our records.

PLEASE NOTE:

Upon final determination of exempt status, the research team is responsible for conducting the research as stated in the exempt application reviewed by the ORI - HS and/or the IRB which shall include using the most recently submitted Informed Consent/Assent Forms (Information Sheet) and recruitment materials.

If your project involves paying research participants, it is recommended to contact Carisa Shaffer, ORI Program Coordinator at (702) 895-2794 to ensure compliance with the Policy for Incentives for Human Research Subjects.

Any changes to the application may cause this protocol to require a different level of IRB review. Should any changes need to be made, please submit a **Modification Form**. When the above-referenced protocol has been completed, please submit a **Continuing Review/Progress Completion report** to notify ORI - HS of its closure.

If you have questions, please contact the Office of Research Integrity - Human Subjects at IRB@unlv.edu or call 702-895-2794. Please include your protocol title and IRBNet ID in all correspondence.


Office of Research Integrity - Human Subjects
4505 Maryland Parkway . Box 451047 . Las Vegas, Nevada 89154-1047
(702) 895-2794 . FAX: (702) 895-0805 . IRB@unlv.edu

Appendix C: Asthma Action Plan English Template

Asthma Action Plan for Oshiro Pediatrics (Ages 7 to 17)

Patient Name:

Date:

I feel great.  **Green Zone: Prevent**

That means...

- No trouble breathing, coughing, or wheezing.
- Playing normally.
- Sleeping well.


I will take these medications daily to control my asthma: No control meds needed.

Aerospan Alvesco Arnuity Ellipta Asmanex Flovent Pulmicort
 QVAR Advair Breo Ellipta Dulera Symbicort Other: _____

Take ____ puff(s) ____ times a day OR one nebulizer treatment(s) ____ times a day

Montelukast (Singulair): Take ____ by mouth once daily at bedtime.

For asthma with exercise, do: Albuterol or Xopenex
Take 2 puffs 15 min before exercise.

I don't feel good.  **Yellow Zone: Caution**


That means...

- Trouble breathing, coughing, or wheezing.
- Cannot play well.
- Waking up at night.

I will take my **Green Zone** medications plus: Albuterol Xopenex Other: _____

Take ____ puff(s) every ____ hours OR one nebulizer treatment(s) every ____ hours as needed.

If you have been in the **Yellow Zone** for more than 12 hours:
Call your doctor, go to the ER, or call 911!

I feel bad.  **Red Zone: Alert**

That means...

- It's getting harder to breathe.
- Medications are not helping.
- Trouble walking or talking.
- Cannot do activities or sleep.

I will take my **Green Zone** and **Yellow Zone** medications plus:
Go to the ER or call 911 right away!

*This AAP will not use peak flow meter readings.

*This information is for general purposes and is not intended to replace the advice of a qualified health professional.


Appendix D: Asthma Action Plan Spanish Template

Plan de Asma Acción para Oshiro Pediatrics (Edades 7 a 17 Años)

Nombre del Paciente:

Fecha:

Me siento estupendo/a.



Zona Verde: Prevención

Quiere decir...

- No problema al respirar, toser, o sibilancias.
- Jugando normal.
- Dormir bien.

Yo tomaré estos medicamentos a diario para controlar mi asma: No medicamentos.

Aerospan Alvesco Arnuity Ellipta Asmanex Flovent Pulmicort


QVAR Advair Breo Ellipta Dulera Symbicort Other: _____

Tomar _____ bocanada(s) _____ veces por día O un tratamiento de nebulizador _____ veces por día

Montelukast (Singulair): Tomar _____ oralmente una vez al día a la hora de dormir.

Para asma con ejercicios, haga: Albuterol o Xopenex
Tome 2 bocanadas 15 minutos antes de ejercicio.

No me siento bien.



Zona Amarilla: Precaución

Quiere decir...


- Tiene problema al respirar, toser, o sibilancias.
- No está jugando normal.
- Despertando en la noche.

Yo tomaré mis medicamentos de mi **Zona Verde** más: Albuterol Xopenex Otro: _____

Tomar _____ bocanada(s) cada _____ horas O un tratamiento de nebulizador cada _____ horas según sea necesario.

Si tiene más de 12 horas en la **Zona Amarilla**:
Llame a su doctor, vaya a la sala de emergencias, o llame al 911!

Me siento muy mal.



Zona Roja: Alerta

Quiere decir...

- Dificultad para respirar.
- Los medicamentos no están ayudando.
- Problemas al caminar o hablar.
- No jugar or dormir bien.

Yo tomaré mis medicamentos de la **Zona Verde** y **Zona Amarilla** más:
Iré a la sala de emergencias or llamaré al 911 de inmediato!

* Este AAP no usará el medidor de flujo espiratorio máximo.

* Esta información es para propósitos generales y no pretende reemplazar el consejo de un profesional de la salud calificado.

Appendix E: Pre-Intervention Questionnaire

(Delivered via an online application)

1. How often have you been using an asthma action plan with patients with asthma?

Using a scale of 1 to 5 with 1 being none, 3 being sometimes, and 5 being all the time.

2. How would you rate the importance of an asthma action plan for you as a healthcare provider?

Using a scale of 1 to 5 with 1 being not important while 5 being very important.

3. How would you rate the importance of an asthma action plan for your patients?

Using a scale of 1 to 5 with 1 being not important while 5 being very important.

4. How likely are you to recommend an asthma action plan to your patients?

Using a scale of 1 to 5 with 1 being very unlikely while 5 being very likely.

5. What are some barriers to possibly using an AAP in your practice? *Click all that apply.*

- I do not use an AAP
- Time used to apply it
- Cost to utilize it
- Remembering to use it
- AAP not important
- No accessible AAP templates
- No monetary compensation
- Other reasons

6. Of the asthma patients you saw in the past month, what percentage did you see of each asthma severity type?

- Mild intermittent. *Type in percentage.*

- Mild persistent. *Type in percentage.*
- Moderate persistent. *Type in percentage.*
- Severe persistent. *Type in percentage.*

7. How many asthmatic patients at the office currently have an AAP?

Type in number.

Appendix F: Post-Intervention Questionnaire

(Delivered via an online application)

1. How often have you been using an asthma action plan with patients with asthma?

Using a scale of 1 to 5 with 0 being none, 3 being sometimes, and 5 being all the time.

2. How would you rate the importance of an asthma action plan for you as a healthcare provider?

Using a scale of 1 to 5 with 1 being not important while 5 being very important.

3. How would you rate the importance of an asthma action plan for your patients?

Using a scale of 1 to 5 with 1 being not important while 5 being very important.

4. How likely are you to recommend an asthma action plan to your patients?

Using a scale of 0 to 5 with 1 being very unlikely while 5 being very likely.

5. What are some barriers now after using the AAP in your practice? *Click all that apply.*

- I did not use an AAP
- Time used to apply it
- Cost to utilize it
- Remembering to use it
- AAP not important
- No accessible AAP templates
- No monetary compensation
- Other reasons

6. Of the asthma patients you saw in the past month who were given an AAP, what percentage did you see of each asthma severity type?

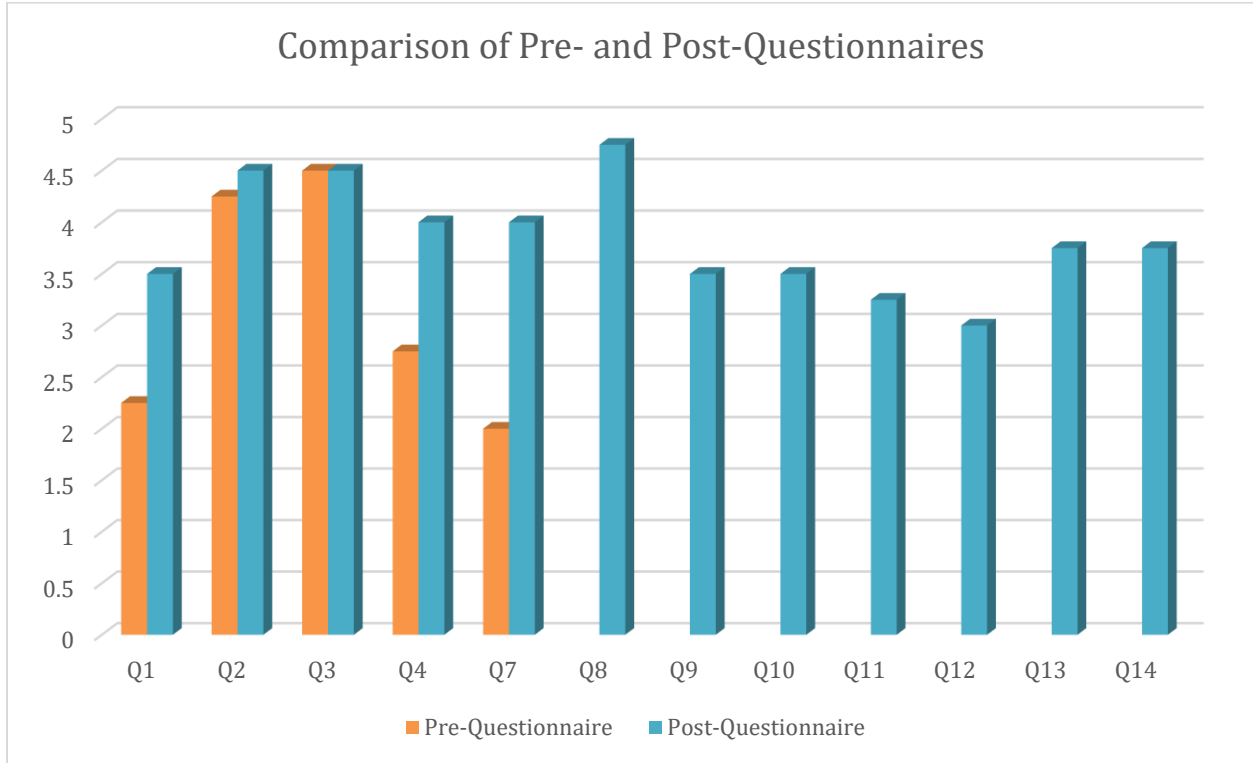
- Mild intermittent. *Type in percentage.*

- Mild persistent. *Type in percentage.*
 - Moderate persistent. *Type in percentage.*
 - Severe persistent. *Type in percentage.*
7. How many asthmatic patients at the office currently have an AAP? *Type in number.*
8. How satisfied are you overall with using an AAP?
Using a scale of 1 to 5 with 1 being very unsatisfied while 5 being very satisfied.
9. How satisfied do you think your asthmatic patients and their caregivers are with an AAP?
Using a scale of 1 to 5 with 1 being very unsatisfied while 5 being very satisfied.
10. How likely do you see yourself continuing to use an AAP?
Using a scale of 1 to 5 with 1 being very unlikely while 5 being very likely.
11. How likely do you see your patients continuing to use an AAP?
Using a scale of 1 to 5 with 1 being very unlikely while 5 being very likely.
12. How would you rate the improvement of asthma signs and symptoms after using the AAP?
Using a scale of 1 to 5 with 1 being no improvement, 3 being somewhat improvement, 5 being great improvement.
13. How would you rate the correct use of medication among patients after using the AAP?
Using a scale of 1 to 5 with 1 being incorrect medication use, 3 being some correct medication use, and 5 being all correct medication use.
14. How would you rate the level of asthma control of your patients after using the AAP?
Using a scale of 1 to 5 with 1 being not under control, 3 being somewhat under control, and 5 being completely under control.

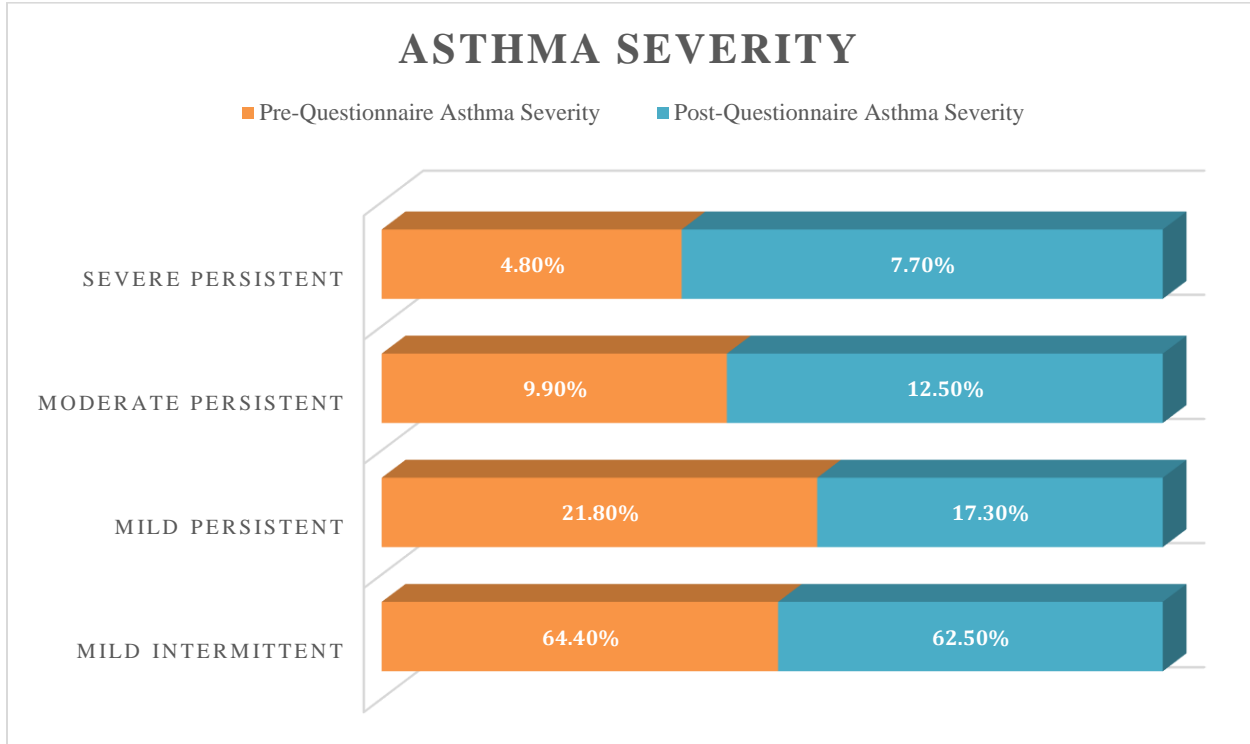
Appendix G: Table Comparison of Pre- and Post-Questionnaires

	Pre-Questionnaire Scores	Post-Questionnaire Scores
Question 1	2.25	3.50
Question 2	4.25	4.50
Question 3	4.50	4.50
Question 4	2.75	4.00
Question 8		4.75
Question 9		3.50
Question 10		3.50
Question 11		3.25
Question 12		3.00
Question 13		3.75
Question 14		3.75

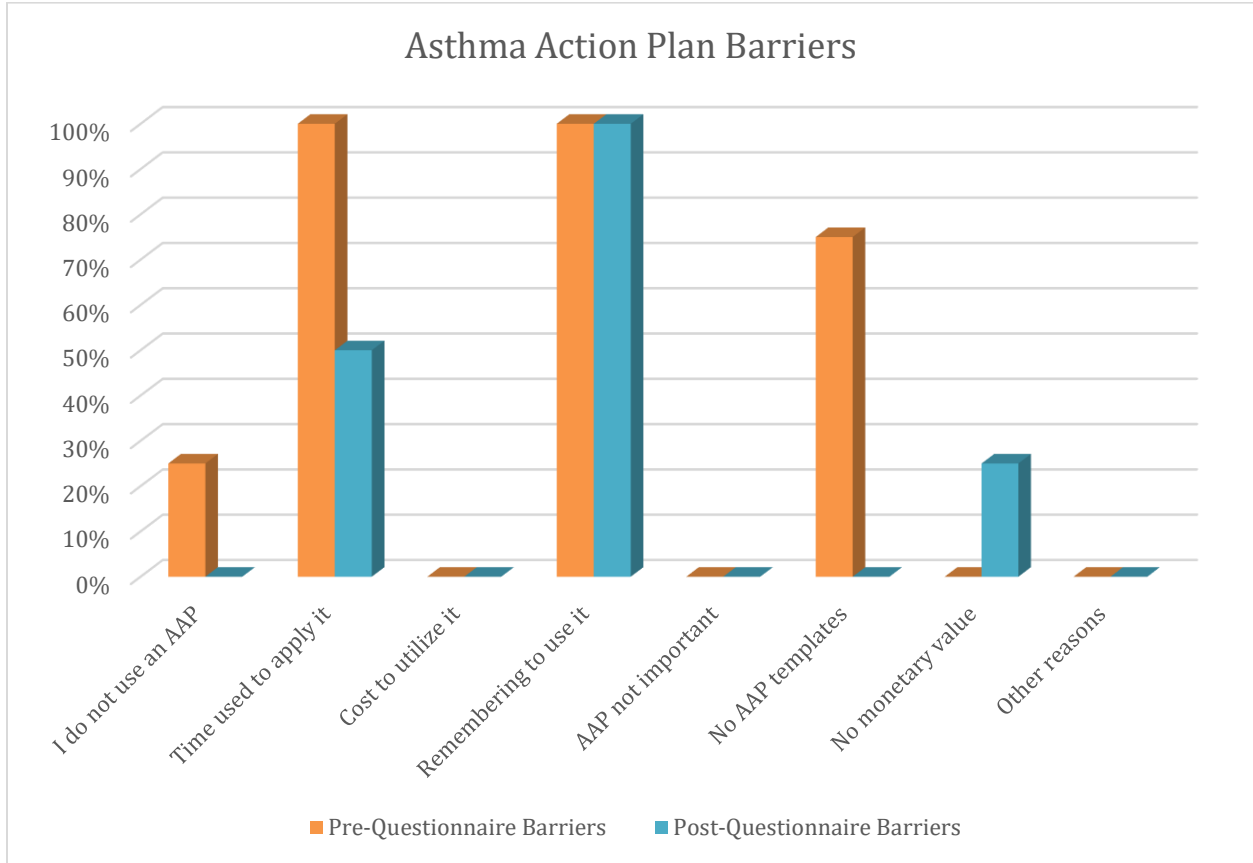
Appendix H: Graph Comparison of Pre- and Post-Questionnaires



Appendix I: Comparison of Asthma Severity



Appendix J: Asthma Action Plan Barriers



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